



**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
DIVISION OF INFRASTRUCTURE**

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

VOLUME 3 OF 3

LAW

**SCHEDULE A
ADDENDA NOS. 1 TO 5**

FOR FURNISHING ALL LABOR AND MATERIALS NECESSARY AND REQUIRED FOR:

PROJECT ID: MIBBNC001

**FOR THE CONSTRUCTION OF STORM SEWERS AND APPURTENANCES
IN:**

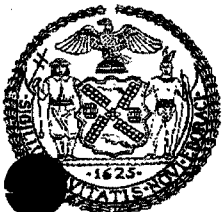
KISWICK STREET BETWEEN HUNTER AVENUE AND BMP NC-7; NUGENT AVENUE BETWEEN HUNTER AVENUE AND BMP NC-7; JEFFERSON AVENUE BETWEEN NUGENT AVENUE AND BMP NC-7; GRIMSBY STREET BETWEEN A POINT APPROXIMATELY 150-FEET EAST OF GRAHAM BOULEVARD AND BMP NC-7; HUNTER AVENUE BETWEEN KISWICK STREET AND NUGENT AVENUE; FREEBORN STREET BETWEEN BMP NC-7 AND BMP NC-8; FREEBORN STREET BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; OLYMPIA BOULEVARD BETWEEN BMP NC-8 AND BMP NC-9; OLYMPIA BOULEVARD BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; GRAHAM BOULEVARD BETWEEN BMP NC-9 AND BMP NC-17; AND, GRAHAM BOULEVARD BETWEEN PATTERSON AVENUE AND BADEN PLACE

INCLUDING WATER MAIN WORK

**Together With All Work Incidental Thereto
BOROUGH OF STATEN ISLAND
CITY OF NEW YORK**

**FOR THE DEPARTMENT OF ENVIRONMENTAL PROTECTION
PREPARED BY
IN-HOUSE DESIGN**

April 4, 2014



14-110



SPECIFICATIONS AND STANDARDS OF NEW YORK CITY

The following NYC Department of Transportation reference documents are available on-line at:

http://www.nyc.gov/html/ddc/html/pubs/pubs_infrastdts.shtml or for purchase between 9:00 A.M. and 3:00 P.M. at 55 Water St., Ground Floor, NYC, N.Y. 10041. Contact: Ms Vivian Valdez, Tel. (212) 839-9434

1. New York City Standard Highway Specifications, November 1, 2010
2. New York City Standard Highway Details of Construction, July 1, 2010
3. New York City Division of Street Lighting Specifications
4. New York City Division of Street Lighting Standard Drawings
5. New York City Standard Specifications for Traffic Signals
6. New York City Standard Drawings for Traffic Signals

The following reference documents for Sewer Work are available on-line at:

http://www.nyc.gov/html/ddc/html/pubs/pubs_infrastdts.shtml or for pick up between 8:00 A.M. and 4:00 P.M. at 30-30 Thomson Avenue, 3rd Floor, Division of Infrastructure, Long Island City, N.Y. 11101. Contact: Mr. William Patalano, Tel. (718) 391-2054

1. New York City DEP Standard Sewer Specifications, August 1, 2009
2. New York City DEP Instructions for Concrete Specifications, Jan. 92
3. New York City DEP General Specification 11-Concrete, November 1991
4. New York City DEP Sewer Design Standards, (September 2007) Revised January 2009

The following reference documents for Water Mains Work are available on-line at: http://www.nyc.gov/html/ddc/html/pubs/pubs_infrastdts.shtml or for pick up between 8:00 A.M. and 4:00 P.M. at 30-30 Thomson Avenue, 3rd Floor, Division of Infrastructure, Long Island City, N.Y. 11101. Contact: Mr. Robert Kuhlmann, Tel. (718) 391-2145

1. New York City Department of Environmental Protection, Standard Water Main Specifications, dated August 1, 2009
2. New York City Department of Environmental Protection Water Main Standard Drawings
3. Specifications for Trunk Main Work, dated March 2012
4. Standards for Green Infrastructure, latest version, available only on-line at: http://www.nyc.gov/html/dep/pdf/green_infrastructure/bioswales-standard-designs.pdf

The water main work material specifications are available at the Department of Environmental Protection, 59-17 Junction Boulevard, 3rd Floor Low-Rise Building, Flushing, N.Y. 11373-5108.

Contact: Mr. Tarlock Sahansra, P.E., Tel. (718) 595-5302
E-mail: TSAHANSRA@DEP.NYC.GOV

Standard Specifications and Drawings for Fire Department Communications facilities of New York City are available at 87 Union Street, Engineering Office, Brooklyn, N.Y. 11231-1416.

Contact: Mr. Ed Durkin, Tel. (718) 624-3752

Tree Planting Standards of the City of New York Parks & Recreation are available at the following Department of Parks & Recreation website:

<http://www.nycgovparks.org/pagefiles/53/Tree-Planting-Standards.pdf>

SPECIFICATIONS AND STANDARDS OF PRIVATE UTILITIES

The Following reference document for Private Utility Work is available for pick up between 8:30 A.M. and 4:00 P.M. at 30-30 Thomson Avenue, First Floor Bid Procurement Room, L.I.C., N.Y. 11101.

1. CET SPECIFICATIONS AND SKETCHES dated November 2010

(NO TEXT ON THIS PAGE)

SCHEDULE "A"**(GENERAL CONDITIONS TO CONSTRUCTION CONTRACT)**
(INCLUDING GENERAL CONDITIONS RELATED TO ARTICLE 22 - INSURANCE)**PART I. REQUIRED INFORMATION**

<p align="center"><u>INFORMATION FOR BIDDERS SECTION 26</u> <u>BID SECURITY</u></p> <p>The Contractor shall obtain a bid security in the amount indicated to the right.</p>	See Attachment 1 (page A-1 of the Bid Booklet)
<p align="center"><u>INFORMATION FOR BIDDERS SECTION 26</u> <u>PERFORMANCE AND PAYMENT BONDS</u></p> <p>The Contractor shall obtain performance and payment bonds in the amount indicated to the right.</p>	See Attachment 1 (page A-1 of the Bid Booklet)
<p align="center"><u>CONTRACT ARTICLE 14.</u> <u>DATE FOR SUBSTANTIAL COMPLETION</u></p> <p>The Contractor shall substantially complete the Work in the number of calendar days indicated to the right.</p>	See Page SA-4
<p align="center"><u>CONTRACT ARTICLE 15.</u> <u>LIQUIDATED DAMAGES</u></p> <p>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.</p>	For Each Consecutive Calendar Day Over Substantial Completion Time: <u>\$1,500.00</u>
<p align="center"><u>CONTRACT ARTICLE 17.</u> <u>SUB-CONTRACTOR</u></p> <p>The Contractor shall not make subcontracts totaling an amount more than the percentage of the total Contract price indicated to the right.</p>	Not to Exceed <u>35%</u> of the Contract Price
<p align="center"><u>CONTRACT ARTICLE 21.</u> <u>RETAINAGE</u></p> <p>The Commissioner shall deduct and retain until the substantial completion of the Work the percent value of the Work indicated to the right.</p>	<u>5%</u> of the Value of the Work
<p align="center"><u>CONTRACT ARTICLE 22.</u></p> <p align="center"><u>(Per Directions Indicated To The Right)</u></p>	See pages SA-5 through SA-9

<p align="center"><u>CONTRACT ARTICLE 24.</u> <u>DEPOSIT GUARANTEE</u></p> <p>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.</p>	<p align="center"><u>1%</u> of Contract Price</p>
<p align="center"><u>CONTRACT ARTICLE 24.</u> <u>PERIOD OF GUARANTEE</u></p> <p>Periods of maintenance and guarantee other than the period set forth in Article 24.1 are indicated to the right.</p>	<p>Thirty-Six (36) Months for Bluebelt Landscaping Work</p> <p>For All Other Work: Eighteen (18) Months, excluding Trees Twenty-Four (24) Months for Tree Planting</p>
<p align="center"><u>CONTRACT ARTICLE 74.</u> <u>STATEMENT OF WORK</u></p> <p>The Contractor shall furnish all labor and materials and perform all Work in strict accordance with the Contract Drawings, Specifications, and all Addenda thereto.</p>	<p align="center">See Contract Article 74</p>
<p align="center"><u>CONTRACT ARTICLE 75.</u> <u>COMPENSATION TO BE PAID TO CONTRACTOR</u></p> <p>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 in Contract Article 75, 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.</p>	<p align="center">See Contract Article 75</p>
<p align="center"><u>CONTRACT ARTICLE 78.</u> <u>PARTICIPATION BY MINORITY-OWNED AND WOMEN-OWNED BUSINESS ENTERPRISES IN CITY PROCUREMENT</u></p>	<p align="center">See M/WBE Utilization Plan in the Bid Booklet</p>

<p align="center"><u>STANDARD HIGHWAY SPECIFICATIONS</u> <u>SECTION 6.40</u> <u>LIQUIDATED DAMAGES FOR</u> <u>ENGINEER'S FIELD OFFICE</u></p> <p>If the Contractor fails to satisfactorily provide the field office and all equipment specified in Section 6.40 - Engineer's Field Office, and/or if a cited deficiency exceed seventy two (72) hours after notice from the Engineer in writing, or is permitted to recur, liquidated damages will be assessed in the amount specified herein for each subsequent calendar day or part thereof that a cited deficiency resulting in nonpayment, as described in Section 6.40.5, is not corrected.</p>	<p>For Each Calendar Day of Deficiency: <u>\$250.00</u></p>
<p align="center"><u>STANDARD HIGHWAY SPECIFICATIONS</u> <u>SECTION 6.70</u> <u>LIQUIDATED DAMAGES FOR</u> <u>MAINTENANCE AND PROTECTION OF TRAFFIC</u></p>	<p>For each instance of failure to comply with the Maintenance and Protection of Traffic requirements within three (3) hours after written notice from the Engineer: <u>\$250.00</u></p> <p>For each and every hour of failing to open the entire width of roadway to traffic the morning following a night/weekend work operation: <u>\$500.00</u></p>
<p align="center"><u>STANDARD HIGHWAY SPECIFICATIONS</u> <u>SECTION 7.13</u> <u>LIQUIDATED DAMAGES FOR</u> <u>MAINTENANCE OF SITE</u></p> <p>If the Contractor fails to comply, within three (3) consecutive hours after written notice from the Engineer, with the requirements of Section 7.13 - Maintenance of Site, the Contractor shall pay to the City of New York, until such notice has been complied with or rescinded, the sum specified above per calendar day, for each instance of such failure, as liquidated damages and not as a penalty, for such default.</p>	<p>For Each Calendar Day, for Each Occurrence: <u>\$250.00</u></p>

Date for Substantial Completion (Reference: Article 14)

The Contractor shall substantially complete the Work within the Final Contract Duration determined in accordance with the terms and conditions set forth herein.

The Base Contract Duration for this project is 540 consecutive calendar days ("ccds").

The Final Contract Duration shall be the Base Contract Duration when a check mark is indicated before the word "NO", below, and shall be the Base Contract Duration adjusted by the table set forth below when a check mark is indicated before the word "YES", below.

YES NO

When the Final Contract Duration is indicated above to be adjusted by the table below, the table may increase the Base Contract Duration depending on the date of scheduled substantial completion to avoid a scheduled substantial completion of the Work during the winter months. The date of the scheduled substantial completion shall be determined by adding the Base Contract Duration to the date specified to commence work in the written Notice To Proceed. The Final Contract Duration shall then be determined as follows:

- (a) Find the row that corresponds to the month of the substantial completion based on the Base Contract Duration added to the date specified to commence work in the written Notice To Proceed.
- (b) Find the number of days to be added to the Base Contract Duration in the table below. Add that number of days to the Base Contract Duration to obtain the Final Contract Duration in consecutive calendar days.

Month Of Substantial Completion Based On The Base Contract Duration	Number Of Days Of Adjustment
January	150
February	120
March	90
April	60
May	30
June	0
July	0
August	0
September	0
October	0
November - December 15	0
December 16 - December 31	180

In addition, should Item No. 9.30 - STORM WATER POLLUTION PREVENTION exist in the Contract and the required Storm Water Pollution Prevention Plan (SWPPP) does not conform to NYSDEC's recommended Standards, an additional 60-ccds shall be added to the above Final Contract Duration.

(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 an X in a box (☒) to left will be required under this contract

<p align="center"><u>TYPES OF INSURANCE</u> (per Article 22 in its entirety, including listed paragraph)</p>	<p align="center"><u>MINIMUM LIMITS AND SPECIAL CONDITIONS</u></p>
<p>■ Commercial General Liability Art. 22.1.1</p>	<p>The minimum limits shall be <u>\$3,000,000</u> per Occurrence and <u>\$6,000,000</u> per Project Aggregate applicable to this Contract.</p> <p>Additional Insureds:</p> <p>(1) <u>City of New York, including its officials and employees, with coverage at least as broad as ISO Form CG 20 10 and CG 20 37.</u></p> <p>(2) <u>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).</u></p> <p>(3) <u>National Grid</u></p> <p>(4)</p>

<input checked="" type="checkbox"/> Workers' Compensation <input checked="" type="checkbox"/> Disability Benefits Insurance <input checked="" type="checkbox"/> Employers' Liability <input type="checkbox"/> Jones Act <input type="checkbox"/> U.S. Longshoremen's and Harbor Workers Compensation Act	Art. 22.1.2 Art. 22.1.2 Art. 22.1.2 Art. 22.1.3 Art. 22.1.3	<p>Workers' Compensation, Employers' Liability, and Disability Benefits Insurance: Statutory per New York State law without regard to jurisdiction.</p> <p>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 (4) Request for WC/DB Exemption Form No. CE-200. The City will not accept an ACORD form as proof of Workers' Compensation or Disability Insurance.</p> <p>Jones Act and U.S. Longshoremen's and Harbor Workers' Compensation Act: Statutory per U.S. Law.</p> <p><input type="checkbox"/> Additional Requirements:</p> <p>(1) (2)</p>
<input type="checkbox"/> Builders' Risk	Art. 22.1.4	<p>100% of Total Value of Work</p> <p>Contractor the Named Insured; the City both an Additional Insured and one of the loss payees as its interests may appear.</p> <p>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.</p> <p>Note: Builders Risk Insurance may terminate upon Substantial Completion of the Work in its entirety.</p>
<input checked="" type="checkbox"/> Commercial Auto Liability	Art. 22.1.5	<p>\$2,000,000 per accident combined single limit</p> <p>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.</p> <p>Additional Insureds:</p> <p>(1) <u>City of New York, including its officials and employees.</u></p> <p>(2) (3)</p>

<input type="checkbox"/> Contractors Pollution Liability	Art. 22.1.6	\$ _____ per occurrence \$ _____ aggregate Additional Insureds: (1) <u>City of New York, including its officials and employees.</u> (2) (3)
<input type="checkbox"/> Marine Protection and Indemnity	Art. 22.1.7(a)	\$ _____ each occurrence \$ _____ aggregate Additional Insureds: (1) <u>City of New York, including its officials and employees.</u> (2) (3)
<input type="checkbox"/> Hull and Machinery Insurance	Art. 22.1.7(b)	\$ _____ per occurrence \$ _____ aggregate Additional Insureds: (1) <u>City of New York, including its officials and employees.</u> (2) (3)
<input type="checkbox"/> Marine Pollution Liability	Art. 22.1.7(c)	\$ _____ per occurrence \$ _____ aggregate Additional Insureds: (1) <u>City of New York, including its officials and employees.</u> (2) (3)

<p>[OTHER] Art. 22.1.8</p> <p><input type="checkbox"/> Railroad Protection Liability Policy</p> <p>(ISO-RIMA or equivalent form) approved by Permitter covering the work to be performed at the designated site and affording protection for damages arising out of bodily injury or death, physical damage to or destruction of property, including damage to the Insured's own property and conforming to the following:</p> <ul style="list-style-type: none"> • Policy Endorsement CG 28 31 - Pollution Exclusion Amendment is required to be endorsed onto the policy when environmental-related work and/or exposures exist. • Indicate the Name and address of the Contractor to perform the work, the Contract Number and the name of the railroad property where the work is being performed and the Agency Permit. • Evidence of Railroad Protective Liability Insurance, must be provided in the form of the <u>Original Policy. A detailed Insurance Binder (ACORD or Manuscript Form) will be accepted pending issuance of the Original Policy, which must be provided within thirty (30) days of the Binder Approval.</u> 	<p><u>\$2,000,000</u> per occurrence</p> <p><u>\$6,000,000</u> annual aggregate</p> <p>Named Insureds:</p> <p>(1)</p> <p>(2)</p>
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<p>[OTHER] Art. 22.1.8</p> <p><input checked="" type="checkbox"/> Professional Liability</p> <p>A. The Contractor's Professional Engineer shall maintain and submit evidence of Professional Liability Insurance in the minimum amount of <u>\$1,000,000</u> per claim. The policy or policies shall include an endorsement to cover the liability assumed by the Contractor under this Contract arising out of the negligent performance of professional services or caused by an error, omission or negligent act of the Contractor's Professional Engineer or anyone employed by the Contractor's Professional Engineer.</p> <p>B. Claims-made policies will be accepted for Professional Liability Insurance. All such policies shall have an extended reporting period option or automatic coverage of not less than two (2) years. If available as an option, the Contractor's Professional Engineer shall purchase extended reporting period coverage effective on cancellation or termination of such insurance unless a new policy is secured with a retroactive date, including at least the last policy year.</p>

<p>[OTHER] Art. 22.1.8</p> <p><input checked="" type="checkbox"/> Engineer's Field Office</p> <p>Section 6.40, Standard Highway Specifications</p>	<p>Fire insurance, extended coverage and vandalism, malicious mischief and burglary, and theft insurance coverage in the amount of <u>\$40,000</u></p>
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<p>[OTHER] Art. 22.1.8</p> <p><input checked="" type="checkbox"/> The Following Additional Insurance Must Be Provided:</p> <p><u>Umbrella/Excess Liability Insurance - The Contractor shall provide Umbrella/Excess Liability Insurance in the minimum amount of \$10,000,000 per Occurrence and \$10,000,000 in Aggregate. The policy terms and condition should be at least as broad as the underlying policies. The underlying policies should comply with the insurance provision as outlined by the contract. Defense cost should be in addition to the limit of liability. The City of New York, including its officials and employees, should be included as additional insured as respects to the noted project.</u></p>
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SCHEDULE "A"
(GENERAL CONDITIONS TO CONSTRUCTION CONTRACT)
(GENERAL CONDITIONS RELATING TO ARTICLE 22 - INSURANCE)

PART III. BROKER'S CERTIFICATION

Pursuant to Article 22.3.3 of the **Contract**, every Certificate Of Insurance must be accompanied by either the following certification by the broker setting forth the following text and required information and signatures or certified copies of all policies referenced in the Certificate Of Insurance.

CERTIFICATION BY BROKER

The undersigned insurance broker represents to the City of New York that the attached Certificate Of Insurance is accurate in all material respects, and that the described insurance is effective as of the date of this Certification.

 [Name Of Broker (Typewritten)]

 [Address Of Broker (Typewritten)]

 [E-Mail Address Of Broker (Typewritten)]

 [Phone Number/Fax Number Of Broker (Typewritten)]

 [Signature Of Authorized Official Or Broker]

 [Name And Title Of Authorized Official (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**.

DDC Director, Insurance Risk Manager

30 - 30 Thomson Avenue, 4th Floor (IDCNY Building)

Long Island City, NY 11101

ATTACH TO CONTRACT DOCUMENTS

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
INFRASTRUCTURE DIVISION
BUREAU OF DESIGN

PROJECT ID: MIBBNC001

FOR THE CONSTRUCTION OF STORM SEWERS AND APPURTENANCES IN:

KISWICK STREET BETWEEN HUNTER AVENUE AND BMP NC-7; NUGENT AVENUE BETWEEN HUNTER AVENUE AND BMP NC-7; JEFFERSON AVENUE BETWEEN NUGENT AVENUE AND BMP NC-7; GRIMSBY STREET BETWEEN A POINT APPROXIMATELY 150- FEET EAST OF GRAHAM BOULEVARD AND BMP NC-7; HUNTER AVENUE BETWEEN KISWICK STREET AND NUGENT AVENUE; FREEBORN STREET BETWEEN BMP NC-7 AND BMP NC-8; FREEBORN STREET BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; OLYMPIA BOULEVARD BETWEEN BMP NC-8 AND BMP NC-9; OLYMPIA BOULEVARD BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; GRAHAM BOULEVARD BETWEEN BMP NC-9 AND BMP NC-17; AND, GRAHAM BOULEVARD BETWEEN PATTERSON AVENUE AND BADEN PLACE

INCLUDING WATER MAIN WORK

Together With All Work Incidental Thereto
BOROUGH OF STATEN ISLAND
CITY OF NEW YORK

ADDENDUM NO. 1

DATED: February 24, 2014

THIS ADDENDUM IS HEREBY MADE A PART OF THE CONTRACT DOCUMENTS

The New York City Department of Transportation Standard Highway Specifications, dated November 1, 2010, (which include, but are not limited to, "General Conditions", "Basic Materials of Construction", "Combined Materials of Construction", "Construction Methods", "Inspection and Testing of Materials, Adjustments for Deficiencies, and Maintenance", and "Supplemental Construction Methods"), as modified by addenda issued prior to the opening of bids, shall apply to and become a part of the contract.

All references contained herein are to the New York City Department of Transportation, Standard Highway Specifications, dated November 1, 2010. The said Specifications are hereby revised. Included hereunder are the following REVISIONS:

1. Amendments to Standard Highway Specifications, Volume I
2. Amendments to Standard Highway Specifications, Volume II, including Section 7.88 (Revised) and new Section 6.44 PO and 6.52 CG.

1. AMENDMENTS TO STANDARD HIGHWAY SPECIFICATIONS, VOLUME I

The following amendments to the Contract Requirements shall become a part of and apply to the contract:

[Added 12-09-2010]

1. Refer to Page 15, **Subsection 1.06.23.(C) CONFORMANCE WITH FEDERAL, STATE AND CITY AGENCIES;**
Add the following new paragraphs:

"The Contractor is notified that all vehicles that are owned, leased or operated by the Contractor or its subcontractors and used in connection with the Project shall comply with the following requirement:

Every truck, tractor, and tractor-trailer or semitrailer combination, having a gross vehicle weight rating of twenty-six thousand pounds or more, and a conventional cab configuration in which more than half of the engine length is forward of the foremost point of the windshield base, and the steering wheel hub is in the forward quarter of the vehicle length shall be equipped with a convex mirror on the front of such vehicle or combination of vehicles. Such convex mirror shall be adjusted so as to enable the operator of such vehicle or combination of vehicles to see all points on an imaginary horizontal line which is three feet above the road, is one foot directly forward from the midpoint of the front of such vehicle or combination of vehicles, and extends the full width of the front of such vehicle or combination of vehicles.

Any vehicle that does not comply with this provision may be prohibited from entering the Project site and/or supplying equipment or materials to the Project. The Contractor shall not be entitled to any damages as a result of such prohibition."

[Added 01-09-2011]

2. Refer to Page 240, **Subsection 4.16.5.(B) STUMP REMOVAL;**
Delete **Subsection 4.16.5.(B) STUMP REMOVAL,** in its entirety:
Substitute the following revised **Subsection 4.16.5.(B) :**

"(B) STUMP REMOVAL

1. Tree stumps designated to be removed and their roots shall be completely excavated to a minimum depth of three (3) feet below the existing grade. A portable stump cutter may be required in some locations. It may be necessary to remove concrete, asphalt, pavers, and/or other types of material surrounding the base of the stump. All excess debris, including chips from tree stumps, shall be removed and disposed of by the Contractor, away from the site prior to backfilling and the area shall be restored by completion of the workday, to the satisfaction of the Engineer. The disposal of tree stumps by burning in open fires will not be permitted.

2. All voids and excavations left after the removal of the stump and roots shall be backfilled to grade with clean earth fill. Fill shall be placed and compacted to a minimum of 95 percent of Standard Proctor Maximum Density by acceptable methods to the satisfaction of the Engineer. Where paving blocks exist, they are to be reset to the existing grade as directed.

3. Maximum safety and care must be used by Contractor during stump removal. The Contractor shall carefully protect against damage all existing trees, plants, curbs, sidewalks and utilities and other features to remain. The Contractor is responsible for locating and protecting underground utilities from damage during stump removal procedures. During stump grinding operations, plywood must be used to protect adjacent vehicles, real property, and pedestrians. If, when removing stumps, existing sidewalks or curbs are disturbed, the Contractor shall restore and/or reset these sidewalks and curbs, at no additional cost to the City. Restoration work shall be done to match the existing, to the satisfaction of the Engineer. All damaged trees, curbs, sidewalks, real property, vehicles and utilities must be addressed within three (3) days."

[Added 04-18-2011]

3. Refer to Pages 218 and 219, **Subsection 4.13.4.(H) PIGMENT**;
Delete the first three (3) paragraphs on page 219:
Substitute the following revised three (3) paragraphs:

"Where the color of the concrete is required to simulate the color of dark gray bluestone, the concrete shall be integrally pigmented to produce a gray color equivalent to: Davis Colors No. 884-3%; Lansco Color No. 437 "Strong Black" 5 lbs. per 94 lbs. Light Grey Portland Cement and 3 parts sand; L.M. Scofield "Cool Black No. 4"; Bayferrox Limestone 330, 2 lbs. per 94 lbs. Light Gray Portland Cement; or an approved equivalent, unless otherwise specified.

Where the color of the concrete is required to simulate the color of light to medium gray granite, the concrete shall be integrally pigmented to produce a gray color equal to: Davis Colors No. 884-1%; Lansco Color No. 437 "Strong Black" 2.5 lbs. per 94 lbs. Light Grey Portland Cement and 3 parts sand; L.M. Scofield "Cool Black No. 1"; Bayferrox Silver 330, 1 lb. per 94 lbs. Light Gray Portland Cement; or an approved equivalent, unless otherwise specified.

Where the sidewalk is designated to have a saw cut joint finish the color of the concrete shall be integrally pigmented to produce a gray color equivalent to L.M. Scofield "Landmarks Grey" K-157-4; L.M. Scofield "Cool Black No. 4"; Davis Colors No. 884-3%; Lansco Color No. 437 "Strong Black" 5 lbs. per 94 lbs. Light Grey Portland Cement and 3 parts sand; Bayferrox NYC Landmark Commission Gray, 3.5 lbs. per 94 lbs. Light Gray Portland Cement; or an approved equivalent, unless otherwise specified."

[Added 07-01-2011]

4. Refer to Page 14, **Subsection 1.06.23.(A) PERMITS**;
Delete line (b) under the first paragraph;
Substitute the following text:

"(b) Any planned work requiring a DOT Construction Permit that may potentially be within 100 feet of a bridge structure will be placed on a Bridge Hold. If any proposed work is within 100 feet of a bridge structure, permittees must submit a scaled drawing showing the work and exact location, along with the following:

- Plan layout of the project area.
- The scope of work.
- The contractor's means and methods.
- Indicate if work will be done on the bridge itself or its abutments, and the type of work.

If the work is more than 100 feet away from the bridge structure, permittees may send a certification by e-mail stating so. Either response must be sent to the Division of Bridges at bridgeshold@dot.nyc.gov for review and release prior to commencing work. Emergency work will not be placed on hold and shall proceed in accordance with the New York City Highway Rules, section 2-11 (g);

(c) Permits from the Department of Sanitation for use of City landfills;"

[Added 07-27-2011]

5. Refer to Page 37, **Subsection 1.06.46. (A) 6. Sign Graphics;**
Delete article "a." beginning with the words "All visual components of the sign are in an Adobe *.pdf file, . . ." and ending with the words ". . . DDC to the Contractor (on a CD or via E-mail) for printing.", in its entirety;
Substitute the following revised article "a":

"a. All visual components of the sign are in an Adobe *.pdf file, which is provided by the Commissioner's representative. The file is not to be altered for composition, type font or image from the version provided by DDC. The Commissioner's representative shall provide a complete file with data and image. The digital file shall be provided by DDC to the Contractor (on a CD or via E-mail) for printing."

[Added 09-27-2012]

6. Refer to Page 36, **Subsection 1.06.46. Project Sign;**
Delete the words "Unless otherwise specified in the Special Provisions of the contract, the following shall apply:";
Substitute the following revised text:

"The Contractor is notified that he shall be required to furnish, install, maintain, and remove, when directed, Construction Project Information Signs (CPIS) as per Sec. 2-02(c)(4) and (5) of the NYC DOT Highway Rule and the cost shall be deemed included under all scheduled items of the contract. In addition, unless otherwise specified in the Special Provisions of the contract, the following Project Sign shall also apply:"

[Added 04-08-2013]

7. Refer to Page 200, **Subsection 4.11.2. (B), first paragraph, sixth line;**
Delete the word "porcelain,".
8. Refer to Page 201, **Subsection 4.11.3. (B) FILL AND BACKFILL, second and third paragraphs;**
Delete the second and third paragraphs under Subsection 4.11.3. (B), in their entirety;
Substitute the following revised two paragraphs:

"Glass or Recycled Porcelain Aggregate (RPA) from recycling facilities that meets the requirements of **Subsection 4.11.3.(E)** for Glass and **Subsection 4.11.3.(F)** for RPA shall be considered suitable material for mixing with fill provided the Contractor maintains the gradations specified herein. However, glass shall not be placed in contact with synthetic liners, geogrids, geotextiles or other geosynthetics.

Glass and/or RPA incorporated into fill shall be thoroughly mixed with other suitable material so that glass, RPA or combination of both constitutes no more than 30 percent by volume anywhere in the fill as visually determined by the Engineer."

9. Refer to Page 202, **Subsection 4.11.3.(E) GLASS;**
Add the following new **Subsection 4.11.3.(F) RECYCLED PORCELAIN**
AGGREGATE (RPA):

“(F) RECYCLED PORCELAIN AGGREGATE (RPA)

All porcelain to be used as RPA shall be crushed by a New York City Department of Environmental Protection (NYCDEP) approved recycling facility to a maximum particle size of 3/8 inch and graded to meet the gradation specified above for use in either fill, backfill or select fill, as may be required. RPA from any other source will not be permitted. The NYCDEP approved recycling facility will also certify that the RPA being furnished is free from organic material and other unsuitable material.

Should the Contractor desire to use RPA in his fill or backfill material, he shall contact Mr. Vasyl Kravchyk at NYCDEP (Tel. No. 718-595-7512) to determine the availability of RPA and from which recycling facility it can be obtained.

The Contractor shall be required to make arrangement with the recycling plant, at least two (2) weeks in advance of when he would need the material, to schedule the time, date and quantity available for pickup. The Contractor shall be required to furnish the recycling facility with a complete list of his trucks involved in transporting the material, which shall include the name of the registered owner (Contractor), Consumer Affairs or DOS Permit numbers, body license plate number, and truck volume. This information must be supplied to the facility prior to the start of picking up the RPA.

Weight ticket receipt slips given by the recycling facility to each truck driver picking up RPA shall be collected by the Contractor and given to the Engineer upon delivering fill or backfill material to the site that contains RPA, and the Contractor agrees and warrants that in obtaining the RPA that such material has originated only from a NYCDEP approved recycling plant and it has not been mixed with porcelain material from any other source.

The Contractor shall be required to transport said material from the approved recycling facility to his yard for storage and mixing with his fill material; however, there is not guarantee that the material will actually be available.

The Contractor is advised that there is no guarantee that RPA will in fact be available for his use from a NYCDEP approved recycling plant and he shall make no claim against the City for loss of anticipated profits should the material not be available upon request by the Contractor.

All excess RPA not used in the fill or backfill shall remain the property of the DDC Contractor.

The Contractor must comply with all rules and regulations of the Department of Transportation and the Department of Environmental Protections governing the use of RPA in its fill and backfill material.”

10. Refer to Pages 218 and 219, **Subsection 4.13.4.(H) PIGMENTING,**
first four paragraphs;
Delete the first four paragraphs under Subsection 4.13.4.(H), in
their entirety;
Substitute the following revised four paragraphs:

“Where pigmenting is specified, the concrete sidewalks shall be pigmented with an admixture complying with the requirements of **Section 2.19** and the following requirements:

‘Commercial Gray’: In commercial districts C4-4 through C4-7, C5 and C6, as defined in the Zoning Resolution of the City of New York, and in areas under the jurisdiction of the Lower Manhattan Development Corporation the color of the concrete shall be integrally pigmented to produce a gray color equivalent to L.M. Scofield ‘Landmarks Grey’ K-157-4; L.M. Scofield ‘Cool Black No. 4’; Davis Colors No. 884-3%; Lansco Color No. 437 ‘Strong Black’ 5 lbs. per 94 lbs. Light Grey Portland Cement and 3 parts sand; Bayferrox NYC Landmark Commission Gray, 3.5 lbs. per 94 lbs. Light Gray Portland Cement; or an approved equivalent, unless otherwise specified.

'Bluestone': Where the color of the concrete is required to simulate the color of dark gray bluestone, the concrete shall be integrally pigmented to produce a gray color equivalent to: Davis Colors No. 884-3%; Lansco Color No. 437 'Strong Black' 5 lbs. per 94 lbs. Light Grey Portland Cement and 3 parts sand; L.M. Scofield 'Cool Black No. 4'; Bayferrox Limestone 330, 2 lbs. per 94 lbs. Light Gray Portland Cement; or an approved equivalent, unless otherwise specified.

'Granite': Where the color of the concrete is required to simulate the color of light to medium gray granite, the concrete shall be integrally pigmented to produce a gray color equal to: Davis Colors No. 884-1%; Lansco Color No. 437 'Strong Black' 2.5 lbs. per 94 lbs. Light Grey Portland Cement and 3 parts sand; L.M. Scofield 'Cool Black No. 1'; Bayferrox Silver 330, 1 lb. per 94 lbs. Light Gray Portland Cement; or an approved equivalent, unless otherwise specified."

[Added 05-24-2013]

11. Refer to Page 14, **Subsection 1.06.23. (A) PERMITS**, first paragraph as modified by Article 4 on page A1-1b;
Add the following new text:

"(d) All necessary permits from the Department of Environmental Protection which may include, but are not limited to, permits for use of City water."

12. Refer to Page 14, **Subsection 1.06.23. (A) PERMITS**, second paragraph;
Add the following as the third paragraph:

"No fee permits for use of City water necessary to complete roadway pavement reconstruction project in conjunction with installation of sewers and/or water mains, will be issued by the Department of Environmental Protection. However, for all other type projects (such as installation of sidewalks, installation of pedestrian ramps, pavement milling, resurfacing, rehabilitation of retaining walls, and bridge reconstruction type projects) the Contractor will be required to obtain the water use permit at its own cost."

[Added 08-05-2013]

13. Refer to page 116, second paragraph up from the bottom of the page, first line;
Change the words "Concrete of Type IA and IIA shall have..." to read "Concrete of Type IA, IIA and IIIA shall have..."

[Added 09-04-2013]

14. Refer to page 100, **Subsection 3.01.3. (C) 1. (c)**;
Delete the last two lines of text beginning with the words "The proportion of reclaimed asphalt pavement permitted within each mix...";
Substitute the following sentence: "The proportion of reclaimed asphalt pavement permitted within each mix shall be not less than 30 percent for the top and bottom courses as per Local Law #71 of 2011."

15. Refer to page 110, **Subsection 3.05.2. (A)**, **Table 3.05-I**;
Insert the following text at the bottom of **Table 3.05-I**:

"Note: The above proportions shown for non-High-Early mixes shall be modified by pozzolan substitutes as per **Subsection 3.05.4.**"

16. Refer to page 112, **Subsection 3.05.3.(C)**, second paragraph;
Delete the second paragraph in its entirety;
Substitute the following paragraph:

"Water shall be potable and drawn from municipal water mains."

17. Refer to page 113, first line of text, beginning with the words
"condition making up one (1) cubic yard of concrete.";
Insert the following sentence between the words "condition making up one
(1) cubic yard of concrete." and "The range of water-cement ratio within which the...":

"The calculated yield of the mix shall be within \pm 2% of the Theoretical (1) cubic yard."

18. Refer to Page 113, second paragraph beginning with the words "The
Contractor may substitute Portland cement";
Delete the second paragraph under **Subsection 3.05.4.**, in its
entirety;
Substitute the following revised paragraph:

"With the exception of high-early strength concrete, the Contractor shall be required to substitute Portland cement with pozzolans (Fly Ash or GGBFS) such that the maximum amount of Portland cement per cubic yard of concrete does not exceed 400 pounds, and with the use of an approved non-corrosive, non-chloride admixture as required to obtain a minimum compressive strength of 3,000 psi in seven (7) days. For high-early strength concrete the Contractor may substitute Portland cement with pozzolans (Fly Ash or GGBFS), pound for pound, up to 20% (or up to 25% for tidal/sea water spray areas) of the weight of cement specified for any concrete mixture provided the Contractor can obtain a minimum compressive strength of 3,000 p.s.i. in three (3) days. The Contractor, immediately following but not later than eight weeks after the date of the Contractor's Notice to Proceed, shall file with the Engineer, Age-Strength data of the job mix he proposes to use for the various ambient temperatures anticipated during the period of concrete placement. This data shall be presented in both tabular and graphical form for those various ambient temperatures with a maximum setting period of seven (7) days for Class B-32 concrete or seventy-two (72) hours for High-Early Strength Concrete."

19. Refer to Page 115, **TABLE 3.05-III - INGREDIENT MATERIALS**;
Change in the third row, second column, the type of Portland
Cement from "Type III*" to read "Type II or Type III*"
20. Refer to page 132, **Subsection 3.06.3.(D)**;
Change the words "Water shall be drawn from mains owned by The City of New York." to
read "Water shall be potable and drawn from municipal water mains."
21. Refer to page 133, **Subsection 3.07.3.(D)**;
Change the words "Water shall be drawn from mains owned by or supplying water to The
City of New York." to read "Water shall be potable and drawn from municipal water
mains."
22. Refer to page 134, **Subsection 3.08.4.(D)**;
Change the words "Water shall be drawn from mains owned by or supplying water to The
City of New York." to read "Water shall be potable and drawn from municipal water
mains."

23. Refer to Page 166, **Subsection 4.05.2. (A)** ;
Delete **Subsection 4.05.2. (A)** , in their entirety;
Substitute the following revised **Subsection 4.05.2. (A)** :

"(A) Concrete Pavement shall be of the following types:

- Type 1--Non-reinforced
- Type 2--Reinforced (Unpigmented or pigmented if specified)
- Type 3--High Early Strength Reinforced (Unpigmented or pigmented if specified)

Type 2 and Type 3 pavements shall consist of a concrete surface course, which shall be unpigmented or pigmented if specified, laid on a concrete base course, which may or may not be pigmented at the Contractor's option, while the base course is still plastic, of the thickness shown on the Contract Drawings, with reinforcement placed between the surface and base courses."

24. Refer to Page 166, **Subsection 4.05.3. (A)** ;
Insert the following new **Subsection 4.05.3. (A1)** :

"(A1) **PIGMENTING**

Where pigmenting is specified, the surface course of the concrete bus pad shall be pigmented with an admixture complying with Section 2.19 and the following requirements:

Where the color of the concrete is required to simulate the red color of the Red Bus Lane Pavement Overlay (Item 6.44 POR in Section 6.44 PO); the surface course concrete shall be integrally pigmented to produce a red color equivalent to Scofield's quarry red.

Except for the use of an air-entraining agent complying with ASTM Designation C 260 and water reducing admixtures complying with ASTM Designation C 494 used in combination with the Pigment Admixture as per the pigment manufacturer's instruction, no other admixtures (including, but not limited to, calcium chloride) shall be used unless stated in writing by the manufacturer of the Pigment Admixture to be of no consequence to the colorfastness of the concrete mixture and is approved by the Engineer.

All pigmented concrete at different locations shall be identical, unless otherwise directed. Variations in color/tint/hue will not be acceptable. Therefore, the same brand and type of cement and the same source and type of aggregate shall be used throughout the project.

Prior to the mix design being made, the cement intended for use shall be checked to determine that its lightness/darkness is similar to the cement used in the original approved sample. The Pigmented Admixture shall be added in the standard proportion specified by the manufacturer."

25. Refer to Page 170, **Subsection 4.05.5. (A) GENERAL** ;
Insert the following two new paragraphs:

"For pigmented concrete, the Contractor shall within eight weeks of the notice to proceed, submit the name of its proposed roadway installer upon which his bid is based, along with their respective work history experience in placing pigmented concrete. The installer shall have documented experience in working with pigmented concrete.

Prior to making any field samples and the placing of any pigmented concrete, the Contractor, its concrete supplier, installer, cement producer, laboratory, the pigmented admixture's representative, and the Engineer shall meet and agree on the specifications and methods of handling the pigmented concrete."

26. Refer to Page 183, **Subsection 4.05.9. PRICES TO COVER**, 4th line;
Insert in the fourth line, the words "pigment when specified" between the
words "specifications, including, but not limited to," and "furnishing and installing...":

27. Refer to Page 183, **Subsection 4.05.9. PRICES TO COVER**;
Insert the following two new Items to the list of Item Nos. at the
bottom of **Subsection 4.05.9**:

"4.05 ACP	REINFORCED CONCETE PAVEMENT (BUS STOPS)(PIGMENTED)	C.Y.
4.05 AXP	HIGH-EARLY STRENGTH REINFORCED CONCRETE PAVEMENT (BUS STOPS)(PIGMENTED)	C.Y."

2. AMENDMENTS TO STANDARD HIGHWAY SPECIFICATIONS, VOLUME II

[Added 01-25-2012]

1. Refer to Pages 365 and 366, Subsection 6.40.2.(C)(c)(1) Personal Computer(s) - Workstation Configuration;

Delete the text under Subsections (a), (b), (c), (d), (h), (i), and (m), in their entirety;

Substitute the following revised text:

- "(a) Make and Model: Dell; HP; Gateway; Acer; or, an approved equivalent. (Note: an approved equivalent requires written approval of the Assistant Commissioner of ITS.)
- (b) Processor: i5-2400 (6MB Cache, 3.1GHz) or faster computer - Single Processor.
- (c) System Ram: Minimum of 4GB (Gigabytes) Dual Channel DDR3 SDRAM at 1333MHz - 2 DIMMSs
- (d) Hard Disk Drive(s): 500 GB (Gigabytes) Serial ATA (7200RPM) w/DataBurst Cache, or larger."
- "(h) Video Display Card: HD Graphics (VGA, HDMI) with a minimum of 64 MB of RAM.
- (i) Monitor: 22" W, 23.0 Inch VIS, Widescreen, VGA/DVI LCD Monitor."
- "(m) Software Requirements: Microsoft Windows 7 Professional SP1, 64 bit; Microsoft Office Professional 2010; Microsoft Project 2010; Adobe Acrobat reader; Anti-Virus software package with 2 year updates subscription; and, either Auto Cad 2012 LT or Microsoft Visio 2010 Standard Edition, as directed by the Engineer."

~~2. Refer to Page 366, Subsection 6.40.2.(C)(c)(2)(b);
Delete the text under Subsection (b), which begins with the words
"(b) One (1) 600 DPI HP Laser Jet . . .", in its entirety;
Substitute the following revised text:~~

~~"(b) One (1) 600 DPI HP Color Laser Jet all-in-one
Printer/Scanner/Copier/Fax (twelve (12) pages per minute or
faster) with one (1) Extra Paper Tray (Legal Size) networked
to all office computers."~~

3. Refer to Page 367, Subsection 6.40.3. SPECIFIC REQUIREMENTS FOR ENGINEERS FIELD OFFICE (TYPE A, B, C, CU, D OR DU), first paragraph;
Delete the text in the first paragraph of Subsection 6.40.3., in its entirety;
Substitute the following revised text:

6.40.3. SPECIFIC REQUIREMENTS FOR ENGINEER'S FIELD OFFICE (TYPE A, B, C, CU, D, OR DU). In addition to the general requirements, each type of Field Office shall have the minimum floor area indicated in Table 6.40-I calculated based on usable area only, excluding any loss factors. Loss factors are defined as those areas such as lobby, sidewalk window ledge, elevator shafts and stairways. The Contractor shall provide and maintain furnishings for each type of Field Office in the quantity specified in Table 6.40-I. The furnishings shall be new or used equipment satisfactory to the Engineer:

- ~~4. Refer to Page 368, TABLE 6.40-I, ADDITIONAL REQUIREMENTS SPECIFIC REQUIREMENTS;
Delete the requirements for a Photocopy Machine shown in the 15th row of TABLE 6.40-I, in its entirety;
Substitute the following revised requirements:~~

Photocopying Machine – Stand-alone, heavy duty, electric, dry-process color photocopying type with a minimum production rate of 70 pages per minute and an adequate supply of copy paper, toner, etc. The machine shall be capable of duplex copying paper sizes of 8-1/2 x 11 inches, 8-1/2 x 14 inches and 11 x 17 inches, and have separate trays for each paper size. It shall have a document feeder, collator, stapler, and the capability to reduce/enlarge copies between each paper size. The supply of each size copy paper, toner, etc. shall be replenished and the machines shall be maintained for the duration of the contract by the Contractor as required by the Engineer. Make and model can be Minolta, Canon, IBM, Epson, or an approved equivalent, and shall be networked to the office computers.	1	1	1	1	1	1
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5. Refer to Page 368, TABLE 6.40-I, ADDITIONAL REQUIREMENTS SPECIFIC REQUIREMENTS;
Insert the following two additional requirements:

Heavy duty commercial grade diamond cut shredder with automatic start. The shredder shall be able to receive 8-1/2 inch wide paper and shred a minimum of 15 sheets simultaneously along with CDs and staples.	1	1	1	1	1	1
Projector – 1080p LCD with a min. of 2200 ANSI Lumens, 1920 x 1080, 16:9, 40,000:1 contrast ratio, HDMI, VGA, USB, and a 10 feet diagonal, 16:9 Projection Screen.	-	-	1	1	1	1

6. Refer to Page 496, Subsection 7.20.4. **METHODS**, last paragraph beginning with the words "When directed by the Engineer, due to the original conditions . . .";
Add the following sentence to the end of the last paragraph under **Subsection 7.20.4**:

"However, if the owner at his own expense supplies the replacement frame and doors or hatch covers the Contractor shall install the replacement frame and doors or hatch covers under this Item 7.20, as a basement access reset, in lieu of the steel safety closure plate."

[Added 07-16-2012]

7. Refer to Page 365, Subsection 6.40.2. (C) (c) (1) "**Personal Computer(s) - Workstation Configuration**";
Delete the text under Subsections (g) and (k), in their entirety;
Substitute the following revised text:

- "(g) I/O Ports: Must have at least one (1) Serial Port, one (1) Parallel Port, and three (3) USB Ports.
- (k) Network Interface: Integrated 10/100/1000 Ethernet card."

8. Refer to Page 366, Subsection 6.40.2. (C) (c) (2) "**All field offices requiring computers shall be provided with the following**";
Delete the text under Subsection (a), in its entirety;
Substitute the following revised text:

- "(a) One (1) broad-band internet service account. Wideband Internet connectivity at a minimum throughput of 15 Mbps download and 5 Mbps upload is required at each field office location with 1-5 staffers. For larger field offices see table below for minimum required upload speeds. Telephone service should be bundled together with Internet connectivity. Because of throughput requirements Verizon FIOS is the preferred connectivity provider where available.

Office Personnel #	Upload Speeds (Minimum)
1 - 5	5 Mbps
6 - 10	10 Mbps
11 - 15	15 Mbps
16 - 20 ...	20 Mbps

This account will be active for the life of the project. The e-mail name for the account shall be the DDC Field Office/project Id (e.g. FLD K HWK666 McGuinness@earthlink.com)."

[Added 08-09-2012]

9. Refer to Page 366, **Subsection 6.40.2. (C) (c) (2) (b)**, as amended by Article 2 on page A1-2 of this Addendum;
Delete the text under **Subsection (b)**, in its entirety;
Substitute the following words: **"(b) (No Text)."**

10. Refer to Page 368, TABLE 6.40-I, ADDITIONAL REQUIREMENTS SPECIFIC REQUIREMENTS;
Delete the requirements for a Photocopy Machine shown in the 15th row of TABLE 6.40-I, as modified by Article 4 on page A1-2a of this Addendum, in its entirety;
Substitute the following revised requirements:

Photocopying Machine – Stand-alone, heavy duty, electric, dry-process color photocopying type with color scan and send capability via e-mail, a minimum production rate of 70 pages per minute and an adequate supply of copy paper, toner, etc. The machine shall be capable of duplex copying paper sizes of 8-1/2 x 11 inches, 8-1/2 x 14 inches and 11 x 17 inches, and have separate trays for each paper size. It shall have a document feeder, collator, stapler, and the capability to reduce/enlarge copies between each paper size. The supply of each size copy paper, toner, etc. shall be replenished and the machines shall be maintained for the duration of the contract by the Contractor as required by the Engineer. Make and model can be Minolta, Canon, IBM, Epson, or an approved equivalent, and shall be networked to the office computers.	1	1	1	1	1	1
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[Added 11-26-2012]

11. Refer to Pages 504 through 508, **SECTION 7.88 - Rodent and Waterbug Pest Control**;
Delete **Section 7.88**, in its entirety;
Substitute **SECTION 7.88 (Revised)**, as contained on the following pages A1-2d through A1-2i.

[Added 02-08-2013]

12. (NO TEXT)

SECTION 7.88 (Revised)
Rodent and Waterbug Pest Control

7.88.1. DESCRIPTION. The Contractor shall provide all labor, materials, plant and equipment, and incidentals required to survey and monitor rodent activity and control any infestation or outbreak of rodents and waterbugs (American cockroaches) within the project limit.

7.88.2. MATERIALS. All materials shall be approved by the New York State Department of Environmental Conservation and comply with the New York City Health Code for the intended usage.

Rodenticide weatherproof bait blocks shall be multiple dose anticoagulants such as Chlorophacinone or Dephacinone, or single feed rodenticides such as ContraMeal, ContractBait block, Quintox pellets or TalonG pellets, or an approved equivalent.

Tamper proof bait station boxes shall be designed to exclude other mammals and shall be used with poisoned bait to attract rats. Information on "tamper proof bait station boxes" is available from the NYC Bureau of Regulatory & Environmental Health Services, Pest Control Office (718-956-7103/4).

Live traps shall be of proper dimensions for trapping rats and shall not be used with poisoned bait.

Insecticide bait shall be a residual type such as phenol methyl carbamate (2%) bait or an approved equivalent.

(A) SUBMITTALS

Prior to commencement of construction activities the Contractor shall submit to the Engineer manufacturer's installation instructions for all materials required for rodent and waterbug pest control work and product data which shall include illustrations, catalog data, product characteristics, typical use, performance, and limitation criteria of all rodent and waterbug pest control materials required.

7.88.3. PERSONNEL. The Contractor shall employ two independent licensed exterminators: one to engage in survey and monitoring work to establish the level of infestation of rodents and insects and provide recommendations for specific Integrated Pest Management (IPM) actions, and one to execute the rodent and waterbug pest control work to deal with such infestations. All pest control personnel employed by each exterminator company must be supervised by an exterminator licensed in categories 7A & 8. The Contractor shall submit the names and license credentials of the two exterminator companies to the Engineer for approval prior to the commencement of any work under this section.

7.88.4. METHODS. Application and dosage of all materials shall be done in strict compliance with the manufacturer's recommendations. All surveying, monitoring, baiting, and/or live trapping work shall be performed in the presence of the Engineer, without which no payment will be made under this Section.

(A) GENERAL

The Contractor's construction activity is expected to disturb any established rodent and/or waterbug population that may exist within the project limits, possibly causing their dispersion. The Contractor shall take all appropriate action to eliminate and/or control these populations within the construction corridor: the construction corridor shall be defined as being the full width of streets under the contract and intersecting streets up to the limits of construction, from property line to property line, excluding buildings and under sidewalk building vaults.

Under the Maintenance of Site requirements for the contract, any unsanitary conditions, such as uncollected garbage or debris, resulting from the Contractor's activities which will provide food and shelter to the resident rodent population shall be corrected by the Contractor immediately after notification of such condition by the Engineer. Non-compliance shall be subject to the application of the "Nonconformance" provisions of the Item for Maintenance of Site, and no payment will be made for any additional application of rodenticide or insecticide needed to control resultant infestations.

(B) SURVEY AND MONITORING WORK

(1) Prior to Construction - The Contractor's designated survey and monitoring exterminator shall execute a survey of the project area and estimate the level of rodent (Norway rat, House mouse) infestation and the waterbug population within the construction corridor. An appropriate sample of utility manholes (sewer, electrical, telephone, etc.) and catch basins should be opened and surveyed to the satisfaction of the Engineer. Contractor shall maintain all survey records in the manner described in 7.88.6., Records and Reports.

(2) During Construction - The Contractor shall monitor the rodent activity through trapping (snap, glue traps or live traps), fecal count methods, and inspection of the conditions of all installed baits every week during construction activity or as otherwise directed by the Engineer. Contractor shall maintain all monitoring records in the manner described in 7.88.6., Records and Reports.

(C) RODENT CONTROL WORK

(1) Wetlands, Woodlands and Areas Within Seventy-five (75') feet of a Stream. In wetlands, woodlands and areas adjacent to a stream, special precautions must be taken to protect water quality and to ensure the safety of other wildlife. To prevent poisoned bait from entering streams, no poisoned bait shall be used in areas within seventy-five (75') feet of either streambank. Live traps must be used in these seventy-five (75') feet buffer zone areas and within wetland and woodland areas.

(2) Outside Wetland Areas, Woodland Areas and Beyond Seventy-five (75') feet of a Stream. In areas outside the seventy-five foot zone of protection adjacent to streams, and areas outside wetlands and woodlands, tamper proof bait stations with poisoned bait shall be established during the period of construction and any consumed or decomposed bait shall be replenished as directed.

Rodent control shall be achieved in two stages as follows:

Stage I. At least one month prior to initiation of the construction work, and periodically thereafter, live traps and/or rodenticide bait, as directed above, shall be placed at locations [e.g., burrows, utility manholes (sewer, electrical, phone, etc.), and catch basins] that are inaccessible to pets, human beings, children and other non-target species, particularly wildlife (e.g., birds) in the construction corridor. Locations of initial bait placement and quantities of bait shall be determined by the survey and monitoring exterminator's written report of his survey and monitoring results, or as otherwise directed by the Engineer.

Stage II. During Construction - Infested sites as determined by the survey and monitoring exterminator's monitoring report shall be baited and/or rebaited, and live traps shall be collected and replaced, the rates and quantities of which shall be determined by the written monitoring reports submitted weekly or as otherwise directed by the Engineer in consultation with the City's Office of Pest Control.

The baiting exterminator shall be responsible for collecting and disposing of all trapped and poisoned rodents found in live traps and tamper proof bait stations. The baiting exterminator shall also be responsible for posting and maintaining signs announcing the baiting of each particular location.

The Contractor, under his maintenance of site operations, shall be responsible for the immediate collection and disposal of any visible rodent remains found on streets or sidewalk within the project limits. Any visible remains shall be placed into double plastic bags. No more than five (5) carcasses shall be placed into each bag. Each bag shall be a minimum of 3 mils thick, black plastic. No additional payment will be made for this work.

It is anticipated that public complaints will be addressed to the Engineer's Field Office. The Contractor, where directed by the Engineer, shall take appropriate Integrated Pest Management (IPM) actions, such as baiting, trapping, proofing, etc., to remedy the source of a complaint within the next six (6) hours of normal working time, which is defined herein, for the purposes of this section, as 7 A.M. to 6 P.M. on Mondays through Saturdays.

(D) WATERBUG (AMERICAN COCKROACH) CONTROL

Infested sites (e.g., sewers) shall be baited at least 2 times per month with insecticides, or as directed by the Engineer in consultation with the exterminator monitoring the work and the City's Office of Pest Control.

7.88.5. EDUCATION & TRAINING. The Contractor shall post notices in all Construction Bulletin Boards advising workers, employees, and residents to call the Engineer's Field Office to report rodent and waterbug infestations. The Contractor shall provide and distribute literature pertaining to IPM techniques of rodent control to affected businesses and superintendents of nearby residential buildings to ensure their participation in maintaining their establishments free of unsanitary conditions, harborage removal and rodent proofing.

Prior to application of any chemicals, the Contractor shall furnish copies or sample labels for each pesticide, antidote information, and Material Data Safety Sheets (MSDS) for each chemical used.

7.88.6. RECORDS AND REPORTS.

(A) GENERAL

The Contractor shall be responsible for assigning within the construction corridor an identifying number to each manhole, catch basin, and other location where bait and/or live trap placement and/or waterbug control work is proposed by the survey and monitoring exterminator. The Contractor shall then provide that list of locations and corresponding reference numbers along with a drawing showing the locations, as a reference for the exterminator(s) performing the work, to indicate locations of bait placement and waterbug control work and rodent and waterbug activity (droppings, bait consumed, dead rodents, etc.).

(B) SURVEY AND MONITORING WORK

(1) Prior to Construction - Contractor shall submit to the Engineer, for approval, a written survey report including proposed IPM procedures, including specific materials, quantities, locations, methods, and time schedule for the implementation of the exterminating work. The written report shall also include a survey with a drawing (provided by the Contractor) marked with locations indicating all signs of rodent (Norway rat, House mouse) infestation and waterbug activity discovered during the execution of the survey indicating that rodent and waterbug pest control work is necessary.

(2) During Construction - Based on monitoring results, Contractor shall submit to the Engineer a weekly written monitoring report identifying all locations and conditions of installed bait and/or other rodent control work. The monitoring report shall also include any other recommended IPM techniques, such as baiting, trapping, proofing, etc., proposed for rodent and waterbug pest control.

The survey and monitoring exterminator shall keep a record of all rodent and waterbug infestation surveys s/he has conducted. The Contractor shall be required to submit a copy of all survey and monitoring reports to the Engineer each week, prior to payment.

(C) RODENT AND WATERBUG CONTROL WORK

The baiting exterminator shall maintain records of all locations baited along with the type and quantity of rodenticide and insecticide bait used. These records will be kept by the City Inspector. A weekly report shall be prepared, signed and certified by the approved licensed exterminator, and such reports shall be submitted to the Engineer each week, prior to payment.

7.88.7. NONCONFORMANCE. If the Contractor fails to perform as directed to control the rodent and/or waterbug population at any location within the project limits for a period of more than one week, the Engineer will correct the adverse conditions by any means he deems appropriate, including but not limited to, the use of "outside services" and shall deduct the cost of the corrective work from any monies due to the Contractor. The deducted cost of this work shall be in addition to the non-payment for rodent and waterbug pest control.

7.88.8. MEASUREMENT.

(A) RODENT INFESTATION SURVEY AND MONITORING

The quantity to be measured for payment under Item No. 7.88 AA, RODENT INFESTATION SURVEY AND MONITORING, shall be a Lump Sum measurement.

(B) RODENT BAIT STATIONS

The quantity to be measured for payment under Item No. 7.88 AB, RODENT BAIT STATIONS, shall be the number of tamper-proof rodent bait station boxes and/or live traps satisfactorily installed or reinstalled after inspection within the construction corridor, as approved by the Engineer. However, the initial baiting, and subsequent rebaiting as may be required, of any bait station will be paid for under Item 7.88 AC.

(C) BAITING OF RODENT BAIT STATIONS

The quantity to be measured for payment under Item No. 7.88 AC, BAITING OF RODENT BAIT STATIONS, shall be the number of tamper-proof rodent bait station boxes, utility manholes, catch basins, or other locations approved by the Engineer, satisfactorily baited or rebaited to replenish consumed or decomposed bait within the construction corridor, as approved by the Engineer.

(D) WATERBUG BAIT APPLICATION

The quantity to be measured for payment under Item No. 7.88 AD, WATERBUG BAIT APPLICATIONS, shall be the number of blocks satisfactorily treated with insecticide bait within the construction corridor, as approved by the Engineer. A block shall be defined as the area of street, measured between property lines, from intersection to intersection. Each rebaiting of any block shall be considered as a new block for measurement purposes.

7.88.9. PRICES TO COVER.

(A) RODENT INFESTATION SURVEY AND MONITORING

Payment will be made at the lump sum price bid for RODENT INFESTATION SURVEY AND MONITORING which shall include the cost of furnishing all the labor, materials, plant, equipment (traps, etc.), insurance, and other incidentals required, including but not limited to providing all required maintenance of traffic equipment, to perform a rodent infestation survey of the project area and then monitor the site each week for rodent activity, all in accordance with the specifications and the directions of the Engineer.

Ten (10%) percent of the lump sum price bid will be paid when the initial survey of the project area has been completed and the written survey report has been submitted to the satisfaction of the Engineer. The remainder will be paid in proportion to the percentage of contract completion.

(B) RODENT BAIT STATIONS

The Contract price bid for RODENT BAIT STATIONS shall be a unit price per each tamper proof bait station box and/ or live trap installed or reinstalled after inspection and shall cover the cost of furnishing all labor, materials, plant, equipment (bait stations, etc.), insurance, and other incidentals, including but not limited to providing all required maintenance of traffic equipment, required to control the rodent population found within the project limits in accordance with the specifications and the directions of the Engineer.

In addition to the payment for Rodent Bait Stations installed or reinstalled under this Item 7.88 AB, the Contractor will also be paid for each baiting or rebaiting, when required, of each bait station, under Item No. 7.88 AC.

(C) BAITING OF RODENT BAIT STATIONS

The Contract price bid for BAITING OF RODENT BAIT STATIONS shall be a unit price per each bait station, utility manhole, catch basin or other location approved by the Engineer satisfactorily baited or rebaited, when required, and shall cover the cost of furnishing all labor, materials, plant, equipment (bait), insurance, and other incidentals, in accordance with the specifications and directions of the Engineer. Installation or resetting of the bait station will be paid for under Item 7.88 AB.

(D) WATERBUG BAIT APPLICATION

The Contract price bid for WATERBUG BAIT APPLICATION shall be a unit price per block treated by the exterminator and shall include the cost of furnishing all the labor, materials, plant, equipment (bait, etc.), insurance, and other incidentals, including but not limited to providing all required maintenance of traffic equipment, necessary to control the waterbug population found within the project limits for the duration of the contract in accordance with the specifications and the directions of the Engineer.

Payment will be made under:

Item No.	Item	Pay Unit
7.88 AA	RODENT INFESTATION SURVEY AND MONITORING	L.S.
7.88 AB	RODENT BAIT STATIONS	EACH
7.88 AC	BAITING OF RODENT BAIT STATIONS	EACH
7.88 AD	WATERBUG BAIT APPLICATION	BLOCK

[Added 05-24-2013]

13. Refer to Page 366, **Subsection 6.40.2.(C)(c)(1)(m) Software Requirements**, as modified by Article 1 on page A1-2;
Delete the text under **Subsection (m)**, in its entirety;
Substitute the following revised text:

"(m) **Software Requirements:** Microsoft Windows 7 Professional SP1, 32 bit; Microsoft Office Professional 2010; Microsoft Project 2010; Adobe Acrobat reader; Anti-Virus software package with 2 year updates subscription; and, either Auto Cad LT or Microsoft Visio Standard Edition, as directed by the Engineer."

[Added 09-04-2013]

14. Refer to Page 384, the end of **Section 6.44 - White and Yellow Thermoplastic Reflectorized Pavement Markings**;
Insert new **SECTION 6.44 PO**, after **Section 6.44**, as contained on the following pages A1-2k through A1-2m.

[Added 02-10-2014]

15. Refer to Pages 393 and 394, **SECTION 6.52 - Uniformed Full-Time Flagperson**;
Delete **Section 6.52** on pages 393 and 394, but do not delete examples on pages 395 and 396;
Substitute **SECTION 6.52 CG**, as contained on the following pages A1-2n and A1-2o.

SECTION 6.44 PO
Lane Pavement Overlay

6.44PO.1. DESCRIPTION. This section describes the furnishing and application of an approved Green Asphalt Pavement Color Scheme along designated bicycle lanes and Brick-Red Asphalt Pavement Color Scheme matching Quest's StreetBondCL Terracotta color along designated Select Bus Service (SBS) lanes, as indicated in the Contract Drawings or as directed by the Engineer.

6.44PO.2. REFERENCES.

- A. ASTM D-4541 Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Tester.
- B. ASTM D-4060 Test Method for Abrasion Resistance of Organic Coatings by the Taber Abrasion.
- C. ASTM D-522-93A Standard Test Method for Mandrel Bend Test of Attached Organic Coatings.
- D. ASTM G-155 QUV Accelerated Weathering Environment. Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials.
- E. ASTM D-2486 MEK rub test for chemical resistance.
- F. ASTM D-570 Standard Test Method for water absorption of plastics.
- G. ASTM E-303 British Pendulum test for friction.
- H. EPA 24 ASTM D3960-05 Volatile Organic Compounds.

6.44PO.3. SUBMITTALS.

- A. A copy of the current year accreditation certificate available from the Contractor or subcontractor who will be performing this work, or written verification from the coating supplier that the Contractor or subcontractor is qualified to perform this Work.
- B. Written and published specification for the application of the selected asphalt pavement coating.
- C. Confirmation of coating color.
- D. Proof of coating performance through a Certificate of Analysis or equivalent document as provided by the Contractor or the coating supplier.

6.44PO.4. MATERIALS.

The following table outlines minimum performance properties of a typical asphalt pavement coating.

Characteristic	Test Specification	Measured result
Durability: Taber Abrasion resistance	ASTM D-4060 7 day cure, H-10 wheel (wet test)	< 5.0 g/1000
Water sensitivity	ASTM D-570 Water absorption after 9 days: Remaining absorption after 1 hour of recovery:	< 10% < 1.0%
Color stability	ASTM G-155 QUV 2,000 hours (CIE units)	New York City Bike Lane Green $\Delta E < 1.5$
Color stability	ASTM G-155 QUV 2,000 hours (CIE units)	Brick color $\Delta E < 1.5$

Flexibility: Mandrel Bend	ASTM D-522-93A Flexibility as measured by Mandrel bend 0.5mm thick sample passes 10 mm at 21°C 0.5mm thick sample passes 125mm at -18°C	
Chemical resistance	ASTM D-2486 Modified MEK scrubs 16 dry mils, number of scrubs until 50% substrate exposed	>5000
Adhesion to Asphalt	ASTM D-4541	Substrate Failure
Friction Wet	ASTM E-303 British Pendulum Tester	>55
Environmental Sensitivity	EPA 24 ASTM D-3960-05 Volatile Organic Compounds	VOC < 150

These properties shall be evidenced by Certificates of Analysis produced by an independent qualified testing facility.

Green Bicycle and Red Bus Lane Pavement Overlays furnished by the following manufacturers, or approved equivalent, are acceptable for use in this contract:

Ennis Paint, Inc.
1509 S. Kaufman Street
Ennis, TX 75119

Integrated Pavement Concepts, Inc.
102-17957 55th Avenue
Surrey, BC Canada V3S 6C4

Crafco, Inc.
420 N. Roosevelt Avenue
Chandler, AZ 85226

6.44PO.5. METHODS. The asphalt pavement coating system shall be applied to the pavement in accordance with the manufacturer's specification. In its hardened state the color shall be as specified, and as approved by the Engineer. The material shall present a marking whose color and chemical resistance will not degrade under normal exposure to calcium chloride, sodium chloride or automotive oils and fuels. Color pigments used shall remain stable under exposure to ultra violet light. A minimum of four (4) layers of coating material shall be applied to the pavement surface.

The Contractor shall be required to use the proper equipment in the application of the asphalt pavement coating, as per the recommendation of the coating supplier, and as approved by the Engineer.

Asphalt pavement must be stable, well compacted and generally in excellent condition for the application of the asphalt pavement coating to be successful. The Engineer shall make the final determination as to the suitability of the existing asphalt pavement.

The asphalt pavement surface shall be dry and free from all foreign matter, including but not limited to dirt, dust, de-icing materials, and chemical residue.

The asphalt pavement coating shall only be applied in the correct environmental conditions as instructed by the coating supplier, and as approved by the Engineer.

Refer to the instructions provided by the coating supplier regarding when the painted lane may be opened to traffic. Wait time is typically a function of the dry rate of the coating, and climate conditions.

The Engineer may, at his discretion, require the Contractor to remove all extraneous marks on the pavement made by the agents or employees of the Contractor, or made by others due to improper control or protection of the work area by the Contractor, his agents or employees. Any installation which, in the opinion of the Engineer, is not acceptable, whether by reason of poor workmanship, poor appearance, poor performance, poor materials, improper width or improper alignment, shall be reworked by the Contractor at no cost to the City. The Contractor shall replace rejected installation as directed by the Engineer, within fifteen (15) days after receiving written notification of the rejection of such completed work.

6.44PO.6. MEASUREMENT. The quantities to be measured for payment shall be the number of square yards of Lane Pavement Overlay, of each color, placed as specified to the satisfaction of the Engineer.

6.44PO.7. PRICES TO COVER. The unit prices bid per square yard of Green Bicycle Lane Pavement Overlay and Red Bus Lane Pavement Overlay shall cover the cost of all labor, materials, plant, equipment, insurance, and necessary incidentals required including, but not limited to, testing, cleaning, preparation of surfaces, and application of the lane pavement overlay materials, all in accordance with the contract plans and specifications, and as directed by the Engineer.

Payment will be made under:

Item No.	Item	Pay Unit
6.44 POG	GREEN BICYCLE LANE PAVEMENT OVERLAY	S.Y.
6.44 POR	RED BUS LANE PAVEMENT OVERLAY	S.Y.

SECTION 6.52 CG Crossing Guard

6.52CG.1. INTENT. This section describes the employment of full-time uniformed crossing guards to direct and detour traffic.

6.52CG.2. DESCRIPTION. The Contractor shall furnish an adequate number of competent crossing guards to control vehicular and pedestrian traffic when it is necessary to maintain alternating one-way traffic in one lane of a two-way roadway, and at all other locations where construction operations, construction vehicles and equipment, and temporary traffic patterns related to the construction operations require positive temporary traffic control for safe, efficient traffic operations.

6.52CG.3. METHODS. All crossing guards, whether paid for under this item or not, shall be proficient in speaking, writing and reading English and adequately trained, as approved by the Engineer, in controlling vehicular and pedestrian traffic at construction sites.

All crossing guards, whether paid for under this item or not, their apparel, hand-signaling devices, and active two-way radios shall be appropriate for use at roadway construction sites as approved by the Engineer.

Prior to the start of crossing guard operations, the Contractor shall provide to the Engineer a list of crossing guards to be used in the contract, identifying the source of crossing guard training for each individual. When requested by the Engineer, crossing guards shall demonstrate their competency in crossing guard procedures. Crossing guards not competent in controlling vehicular and pedestrian traffic procedures to the satisfaction of the Engineer shall be retrained or replaced at once. Each crossing guard paid under this item must be a full-time crossing guard. If any worker performing services under this item is also assigned the task of directing construction equipment (as per attached Example #2, worker acting as a flagperson 'A') or any laborer tasks, then such worker shall be deemed to be subject to the provisions of Labor Law §220 Prevailing Wage Schedule and will not be paid for under this item.

6.52CG.4. MEASUREMENT. The quantity to be measured for payment shall be the number of person-hours of uniformed crossing guard service actually performed, as authorized by the Engineer. Laborers who are not full-time crossing guard will not be measured for payment as crossing guards under this or any other item. Each uniformed crossing guard shall be required to work a minimum of eight (8) hours a day and the Contractor will be given a minimum of twelve (12) hours advanced notice by the Engineer as to when to furnish a crossing guard.

6.52CG.5. PRICE TO COVER. The contract price per person-hour shall cover the cost of all labor, materials, equipment, and insurance necessary to employ a uniformed full-time crossing guard, and equip him/her with safety vests, hard hats, and signaling devices, including all other incidental costs necessary to control and detour traffic, as shown on the Contract Drawings, the Examples #1 and #2 on pages 395 and 396 (excluding worker acting as a flagperson "A" in Example #2), or as directed by the Engineer.

Payment for flagperson "A" in Example #2, shall be deemed to be included under other items of work, as appropriate.

Where there is no scheduled item for Crossing Guard, the cost of furnishing Crossing Guards as required shall be deemed included in the unit price bid for the Maintenance and Protection of Traffic item.

Payment will be made under:

Item No.	Item	Pay Unit
6.52 CG	CROSSING GUARD	PERSON-HOUR (P/HR)

[Added 02-24-2014]

16. Refer to Pages 480 and 481, **Subsection 7.13.2. (B) MAINTENANCE OF STREETS**, 4th paragraph, beginning with the words "The Contractor shall maintain the traveled way . . . ;
Delete the 4th paragraph, in its entirety;
Substitute the following text:

"The Contractor shall maintain the traveled way in such a condition and conduct operations in such a manner that snow and ice may be readily removed by others as and when necessary, and in such a manner that proper drainage is provided for the melting of snow in the banks resulting from normal plowing. However, the Contractor will not be responsible for snow or ice removal on the pavement or traveled way opened for public usage, except within the limits of the work zone(s) which may include, but is not be limited to, stairways, promenades, esplanade areas, and sidewalk, including those fronting his office and the Engineer's field office all of which will be the responsibility of the Contractor."

ATTACH TO CONTRACT DOCUMENTS

**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
INFRASTRUCTURE DIVISION
BUREAU OF DESIGN**

PROJECT ID: MIBBNC001

FOR THE CONSTRUCTION OF STORM SEWERS AND APPURTENANCES IN:

KISWICK STREET BETWEEN HUNTER AVENUE AND BMP NC-7; NUGENT AVENUE BETWEEN HUNTER AVENUE AND BMP NC-7; JEFFERSON AVENUE BETWEEN NUGENT AVENUE AND BMP NC-7; GRIMSBY STREET BETWEEN A POINT APPROXIMATELY 150-FEET EAST OF GRAHAM BOULEVARD AND BMP NC-7; HUNTER AVENUE BETWEEN KISWICK STREET AND NUGENT AVENUE; FREEBORN STREET BETWEEN BMP NC-7 AND BMP NC-8; FREEBORN STREET BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; OLYMPIA BOULEVARD BETWEEN BMP NC-8 AND BMP NC-9; OLYMPIA BOULEVARD BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; GRAHAM BOULEVARD BETWEEN BMP NC-9 AND BMP NC-17; AND, GRAHAM BOULEVARD BETWEEN PATTERSON AVENUE AND BADEN PLACE

INCLUDING WATER MAIN WORK

Together With All Work Incidental Thereto

BOROUGH OF STATEN ISLAND

ADDENDUM NO. 2

DATED: March 31, 2014

This Addendum is issued for the purpose of amending the requirements of the contract documents and is hereby made part of said contract documents to the same extent as if it was originally included therein.

The Standard Sewer Specifications of the Department of Environmental Protection (dated August 1, 2009), Sewer Design Standards of the Department of Environmental Protection (dated (September 2007) Revised January 2009), Standard Water Main Specifications of the Department of Environmental Protection (dated August 1, 2009), Water Main Standard Drawings of the Department of Environmental Protection (latest revisions), and the Standard Highway Specifications (Volumes I and II) of the Department of Transportation (dated November 1, 2010) of The City of New York, shall be included as part of the contract documents. These said specifications and standard drawings are hereby revised under the following section headings:

- A. NOTICE TO BIDDERS
- B. AMENDMENTS TO THE STANDARD HIGHWAY SPECIFICATIONS
- C. AMENDMENTS TO THE STANDARD SEWER SPECIFICATIONS
- D. AMENDMENTS TO THE STANDARD WATER MAIN SPECIFICATIONS
- E. SPECIAL PROVISIONS

A. NOTICE TO BIDDERS

- (1) (A) The Contractor is advised that copies of the Standard Sewer Specifications (dated August 1, 2009), Sewer Design Standards (dated (September 2007) Revised January 2009), Standard Water Main Specifications (dated August 1, 2009), Specifications For Trunk Main Work (dated March 2012) and Water Main Standard Drawings (latest revisions) are available to all prospective bidders at no cost upon presentation of receipt of purchase of Bid Package at the following location:

Department of Design and Construction
Division of Infrastructure
Design Services, Specifications, 3rd Floor
30-30 Thomson Avenue
Long Island City, NY 11101

(B) The Contractor is advised that copies of the Standard Highway Specifications (Volume I and II) (dated November 1, 2010), Standard Highway Details of Construction (latest revisions), Division of Street Lighting Specifications (latest revisions), Division of Street Lighting Standard Drawings (latest revisions), Standard Specifications for Traffic Signals (latest revisions), and Standard Drawings for Traffic Signals (latest revisions) are available to all prospective bidders for a fee at the following location:

Department of Transportation
55 Water Street, Ground Floor
New York City, NY 10041

- (2) The Contractor is notified that it is the intent of this Agency to commence work promptly after registration of the contract and to order the Contractor to commence work within two (2) months after registration.
- (3) The Contractor shall furnish, install, maintain and subsequently remove temporary Protective Tree Barriers. Protective Tree Barriers shall be Type B, unless otherwise directed by the Engineer, and shall be constructed and installed as shown on the Protective Tree Barrier sketch in Department Of Transportation, Standard Highway Details Of Construction, Drawing No. H-1046A, as directed by the Engineer, and in accordance with Department of Parks and Recreation requirements.
- (4) All utility locations and invert elevations are not guaranteed, nor is there any guarantee that all existing utilities, whether functional or abandoned within the project area are shown.
- (5) All existing house connections shall be maintained and supported during construction. The Contractor shall replace any existing house connection damaged as a result of the Contractor's construction operations as ordered by the Engineer at no cost to the City.
- (6) The Contractor is advised that any City owned light poles, traffic signals, traffic signs and encumbrances including, but not limited, to underground conduit displaced as the result of the installation of the new sewers, water mains, catch basins, catch basin connections and appurtenances shall be replaced in kind and as directed by the Engineer. The cost of such work shall be deemed included in the prices bid for all items of work under this contract.
- (7) The Contractor is notified that Victaulic Style 77 Coupling is no longer acceptable for use in any steel water main work. All reference to Victaulic Style 77 Coupling within the Standard Water Main Specifications of the Department of Environmental Protection (dated August 1, 2009), the Water Main Standard Drawings of the Department of Environmental Protection (latest revisions), the Specifications For Trunk Main Work (dated March 2012), and the contract drawings, shall be replaced with Bolted Split-Sleeve Restrained Coupling.
- (8) The Contractor is notified that the fuel cost per gallon used in the formula under **Sub-Article 26.2.8** of the Standard Construction Contract for **Extra Work** will be derived from the fuel price index for the

United States East Coast published weekly by the United States Energy Information Administration ("USEIA"), and available on its website at <http://www.eia.gov/petroleum/gasdiesel/>. The USEIA published cost per gallon for the applicable fuel on the East Coast for the week in which the first day of each calendar quarter during the contract term occurs (i.e., January 1st, April 1st, July 1st and September 1st) will be used in the reimbursement formula for all **Extra Work** invoiced that was performed during that calendar quarter. Should the USEIA stop publishing this fuel price index, the fuel cost per gallon will be determined by reference to a substitute index to be agreed upon by the Contractor and the City.

- (9) The Contractor is responsible for any damage to the existing street and traffic signal equipment, including underground conduits and the safety of both pedestrian and vehicular traffic for the duration of the contract.

Should any conduits, cables or foundations need repair due to the Contractor's negligent operations during construction, all work shall be performed according to NYCDOT Bureau of Traffic's Standard Drawings and Specifications at the sole expense of the Contractor.

It is the Contractor's responsibility to secure an approved electrical contractor to perform all traffic signal work (if any). For list of approved electrical contractors, contact Mr. Michael R. LeFosse of New York City Department of Transportation at (718) 786-2236.

- (10) The Contractor is advised that where the existing roadway pavement is designated to be replaced from curb to curb, then no full depth saw cutting of pavement for sewer and water main trenches will be required, except at the limits of full width pavement restoration. No separate or additional payment will be made for any saw cutting.

- (11) At all locations where the Engineer determines that the existing subgrade material has an unsatisfactory soil bearing capacity, the Contractor shall excavate below subgrade to the depth required to remove the unsatisfactory soil (maximum five (5) foot depth below subgrade), and shall backfilled to subgrade with stone ballast as described in **Section 5.28**. Payment for this work shall be made under Item No. 73.31AE0 - ADDITIONAL EARTH EXCAVATION INCLUDING TEST PITS (ALL DEPTHS); and, Item No. 70.71SB - STONE BALLAST. The cost for any additional sheeting and bracing required for excavating below subgrade shall be deemed included in the price bid for Item No. 73.31AE0 - ADDITIONAL EARTH EXCAVATION INCLUDING TEST PITS (ALL DEPTHS).

- (12) The Contractor is notified that in order to perform the modification work to the existing outfall, the Contractor will have to provide for a temporary access way to the existing outfall. The Contractor is further notified that at the completion of the modification work to the existing outfall, the Contractor shall remove the temporary access way completely and restore the areas affected by the temporary access way and the Contractor's construction operations to their original condition, at the direction and to the satisfaction of the Engineer. The cost for all labor, materials, equipment, etc. required and necessary to provide for and remove the temporary access way and to restore the areas affected by the Contractor's construction operations shall be deemed included in the price bid for Item No. 51.71F00000 - MODIFICATION OF EXISTING OUTFALL. No additional of separate payment will be made for this work.

B. AMENDMENTS TO THE STANDARD HIGHWAY SPECIFICATIONS

(NO TEXT)

C. AMENDMENTS TO THE STANDARD SEWER SPECIFICATIONS**(1) Refer to Subsection 1.06.3 - Hours Of Work, Page I-4:**

Add the following to **Subsection 1.06.3**:

- (A) **HOLIDAY CONSTRUCTION EMBARGO** - A special Holiday Construction Embargo shall be in effect on the Friday of the week preceding Thanksgiving Day week from 6:00 AM to 11:59 PM and again from the Monday of Thanksgiving Day week from 6:00 AM through January 2, at 11:59 PM. Roadway and sidewalk construction activities will be restricted during the embargo period on the streets listed below*.

Any permits issued prior to the date of this notice, for work during this embargo period on the streets listed below which do not already have the permit stipulation "410" are hereby suspended for the period noted above. All permittees must comply with this embargo unless a special waiver is granted by OCMC. Waiver requests must be filed at least thirteen (13) days before Thanksgiving Day, in the Permit Office by filing a "Request for Roadway/Sidewalk Permits During Embargo Periods" and submitting supporting documentation. Waiver requests should only be submitted for critical reasons for a specific project. If a waiver is granted, the applicant will be notified so they can apply for the approved permits. Waivers **are not** required for ongoing Building Construction Activity Permits which already include the "410" permit stipulation. Waiver request forms may be obtained at any Permit Office or on the Department of Transportation's website at:

<http://www.nyc.gov/html/dot/downloads/pdf/holidayembapp.pdf>

Prior to this embargo period all necessary measures must be taken so that all roadways and sidewalks are in proper condition to allow for the expeditious and safe movement of vehicular, bicycle and pedestrian traffic. Tool carts, cable reels, containers, and material stored on roadways must be removed during the embargo period.

The opening of utility access covers is prohibited on any of the streets noted below between the hours of 6:00 AM and midnight unless the utility or contractor files for an Emergency Authorization Number as required by section 2-07 of the Department of Transportation's Highway Rules. The planned opening of utility access covers may occur during the hours of 12:01 AM and 5:59 AM where no authorization number is required.

Temporary restoration of the streets and sidewalks and removal thereof, if required for the Holiday Embargo period, will be paid for under the appropriate scheduled items.

No extension of time due to the shutdown period will be granted to the Contractor for completion of the work.

* Please note that this embargo only applies to NYCDOT construction permits. List of street and maps of the affected locations are available by borough on the Department of Transportation's website at: <http://www.nyc.gov/html/dot/html/motorist/trafairs.shtml>

(2) Refer to Subsection 1.06.14 - Notice To Utility Companies, Etc., To Remove Structures Occupying Place Of Sewers, Water Mains Or Appurtenances, Page I-10:

Add the following to **Subsection 1.06.14**:

- (1) CONSOLIDATED EDISON COMPANY OF NEW YORK (CON EDISON)

There are CON EDISON facilities in the area of construction. The Contractor shall notify CON EDISON at least seventy-two (72) hours prior to the start of construction by contacting Mr. Joseph Bedell at (718) 275-2458.

- (2) NATIONAL GRID

There are NATIONAL GRID facilities in the area of construction. The Contractor shall notify NATIONAL GRID at least seventy-two (72) hours prior to the start of construction by contacting Mr. Neville Jacobs Jr. at (718) 963-5612 or at NEVILLE.JACOBS@us.ngrid.com.

(3) VERIZON

There are VERIZON facilities in the area of construction. The Contractor shall notify VERIZON at least seventy-two (72) hours prior to the start of construction by contacting Mr. Anthony Foster at (718) 528-4836.

(4) TIME WARNER CABLE OF NEW YORK CITY

There are TIME WARNER CABLE facilities in the area of construction. The Contractor shall notify TIME WARNER CABLE at least seventy-two (72) hours prior to the start of construction by contacting Mr. John Piazza at (718) 888-4261.

(3) **Refer** to Subsection 1.06.20 - Contractor To Notify City Departments, Page I-12:
Add the following to Subsection 1.06.20:

(1) N.Y.C. D.E.P., BUREAU OF WATER AND SEWERS OPERATIONS

The Contractor shall notify Mr. James Garin, P.E., Assistant Commissioner, Engineering at the Department of Environmental Protection, 59-17 Junction Blvd., 3rd floor low rise, Corona N.Y. 11368, at least thirty (30) days prior to the start of construction.

(2) NEW YORK CITY FIRE DEPARTMENT

The Contractor shall notify the Bureau of Fire Communications at least thirty (30) days prior to the start of construction by contacting Mr. Nick Varone at (718) 624-4194.

(3) N.Y.C. DEPARTMENT OF TRANSPORTATION

The Contractor shall notify Mr. Steve Galgano, P.E. Chief of Signal/Street Lighting Operations, 34-02 Queens Blvd., Long Island City, N.Y. 11101 at (718) 786-3550, at least seventy-two (72) hours prior to the start of construction.

(4) N.Y.C. DEPARTMENT OF PARKS AND RECREATION

The Contractor shall notify the Parks Department at least seventy-two (72) hours prior to the start of construction by contacting Mr. Matthew Stephens at (718) 760-6809.

(5) N.Y.C. TRANSIT AUTHORITY

The Contractor is advised that bus routes as well as bus stops, within the scope of this project may be affected during construction operations. The Contractor shall notify the Transit Authority at least two (2) weeks prior to the start of construction, in order to make the necessary arrangements.

Arrangements shall be made through:

Ms. Sarah Wyss
Director Of Short Range, Bus Service Planning (SRB)
New York City Transit
2 Broadway, 17th Floor
New York, N.Y. 10004
Telephone No. (646) 252-5517

sarah.wyss@nyct.com

- (4) **Refer to Subsection 1.06.27 - Salvageable Materials, Page I-14:**
Delete the paragraph starting with the words, "No salvageable material...", and ending with the words, "... from the site.", in its entirety:

Substitute the following:

Except as specified below, no salvageable material shall be returned to the New York City Department of Environmental Protection regardless of condition. It shall become the property of the Contractor for removal and disposal, by the Contractor, away from the site.

The Contractor shall salvage and deliver to a designated NYCDEP yard all Metropolitan Valves (6" thru 20") removed during construction of the contract.

- (5) **Refer to Subsection 1.06.29 - Contractor To Provide For Traffic, Page I-15:**
Add the following to **Subsection 1.06.29**:

(1) Traffic Stipulations:

The Contractor shall refer to the Traffic Stipulations (two (2) pages) that are attached to the end of this addendum, and as directed by the Engineer.

- (6) **Refer to Section 1.08 - Miscellaneous Provisions, Page I-19:**
Delete Subsection 1.08.2 - Vendors in its entirety:
Substitute the following new **Subsection 1.08.2**:

1.08.2 VENDORS

Prior to starting work, the Contractor shall submit in writing to the Engineer the names of all vendors and manufacturers the Contractor intends to use. Unless otherwise specified in the contract documents or a written exception is granted by NYCDDC, the Contractor shall submit only one (1) vendor or manufacturer for each product that is to be incorporated in the contract. The use of multiple vendors or manufacturers to supply the same product will be prohibited, unless otherwise specified in the contract documents or a written exception is granted by NYCDDC. If the vendor or manufacturer is not approved, the Contractor will be notified to either submit another vendor or manufacturer, or have their proposed vendor or manufacturer submit a request for approval from NYCDDC. The Contractor will be prohibited from using the vendor or manufacturer until approval of the vendor or manufacturer has been acquired from NYCDDC.

- (7) **Refer to Section 1.08 - Miscellaneous Provisions, Page I-20:**
Add the following new **Subsection 1.08.7**:

1.08.7 SUBMITTAL OF SCHEDULE LOG

The Contractor's attention is directed to **Article 9 - Progress Schedule** of the Contract. The Contractor shall submit along with the proposed progress schedule the following: A schedule log in Excel Format (tied to the proposed progress schedule) indicating a description of and the schedule submission dates for all required submittals, shop drawings, approval requests, design mixes, reports, samples, etc., as required by the specifications and the terms of the contract.

- (8) **Refer to Section 2.05 - Precast Reinforced Concrete Pipe, Subsection 2.05.4 - Materials, Workmanship And Finish, Page II-10:**
Delete from **Subsection 2.05.4**, paragraph (A) CONCRETE in its entirety:

Substitute the following:

(A) CONCRETE - The Concrete shall comply with the requirements of **General Specification 11 - Concrete, as modified in Section 2.15**, and be a homogeneous mixture of such proportions and quality that the pipe will conform to the design and test requirements of these specifications.

(9) Refer to **Section 2.15 - Concrete, Subsection 2.15.3 - Modifications**, Page II-23:

Delete from **Subsection 2.15.3, Reference Number D 3.2.1** together with its paragraphs in their entirety:

Substitute the following:

D 3.2.1 DELETE 3.2.1 to 3.2.9 of GS11 and SUBSTITUTE the following:

All concrete mix designs shall be subject to approval by DDC's Quality Assurance and Construction Safety (QACS) Bureau and in accordance with their "MIX DESIGN, LABORATORY AND PLANT APPROVAL PROTOCOL". Copies of this protocol may be obtained at the preconstruction meeting or from the Engineer. Before the Contractor begins to manufacture concrete, the Contractor shall secure DDC's QACS approval of the mix design the Contractor proposes to use.

The Contractor shall submit for this purpose a statement, in writing, of the sources of all ingredient materials, the type and brand of the cement and the number of pounds of each of the materials in a saturated surface-dry condition making up one (1) cubic yard of concrete. The range of water-cement ratios within which the concrete will be manufactured and the method of mixing to be employed shall also be stated. The mix design submittal shall include gradation of aggregates, specific gravities of ingredients, unit weight, mix proportion for each batch (a minimum of four (4) batches except in case of precast plants where one specific mix may be proposed), compressive strength test results for each mix at 7-days, 28-days (high-early strength mixes may require 6-hours, 24-hours, 3-days and shrinkage test as per the requirements), and graphical representation of strength vs. W/C projected in hours/days.

The Contractor may submit for approval concrete mixes that (within one (1) year of the contract) have been previously approved and used on other jobs with any Bureau of the Department of Environmental Protection or the Department of Design and Construction. Such submittals shall contain evidence that the concrete mix was approved within one (1) year of this contract and shall show that the concrete will be produced at the same mix plant, that the cement and admixtures are the same type (though not necessarily the same brand), that the water/cement ratio is the same and that adjustments have been made in the mix for air content, specific gravity and gradation of the aggregates.

If the Contractor elects to submit a concrete mix that was not previously approved, the Contractor shall submit the new concrete mix in accordance with Chapters 2 and 3 of General Specification 11 as modified herein.

(10) Refer to **Section 2.15 - Concrete, Subsection 2.15.3 - Modifications**, Page II-26:

Add to **Subsection 2.15.3**, before **Reference Number D 8.2** the following:

D 7.3.3 ADD the following to Subsection 7.3.3 of GS11:

Each Portland cement concrete batching plant shall be subject to approval by DDC's Quality Assurance and Construction Safety (QACS) Bureau and in accordance with their "MIX DESIGN, LABORATORY AND PLANT APPROVAL PROTOCOL". Copies of this protocol may be obtained at the preconstruction meeting or from the Engineer. The minimum requirement for approval is that the proposed Portland cement concrete

batching plant must be on the New York State Department of Transportation (NYSDOT) approved list for the current construction season.

The minimum requirement for approval of a precast concrete plant is that the proposed plant must be on the NYSDOT approved list. A waiver for this requirement may be granted by the DDC's Quality Assurance and Construction Safety (QACS) Director for special products that no NYSDOT approved plant is capable of producing.

Each Portland cement concrete batching plant shall also be subject to auditing and approval of the DDC's Director of Quality Assurance and Construction Safety (QACS). The Director of QACS may at any time discontinue the use of any previously approved equipment if nonconformance with the specifications results during the progress of the work. When the Director of QACS discontinues the use of the plant, production will not be acceptable for Department work until corrective measures satisfactory to the Director are carried out.

(11) Refer to Section 2.15 - Concrete, Subsection 2.15.3 - Modifications, Page II-26:

Delete from **Subsection 2.15.3, Reference Number D 16.3** together with its paragraphs in their entirety:

Substitute the following:

D 16.3 Testing Service - ADD the following:

The Contractor shall retain the services of an independent testing laboratory to provide for the services outlined in 16.3.1.4 to 16.3.1.11 of GS11, with the exception of those tests specified herein to be performed by the Engineer and the City Retained Laboratory.

All laboratories shall be subject to approval by DDC's Quality Assurance and Construction Safety (QACS) Bureau and in accordance with their "MIX DESIGN, LABORATORY AND PLANT APPROVAL PROTOCOL". Copies of this protocol may be obtained at the pre-construction meeting or from the Engineer. The minimum requirement for approval is that the laboratory must have the current AMRL/AASHTO R-18 accreditation in the category of service proposed and must be currently licensed by the NYC Department of Buildings (DOB).

(12) Refer to Section 2.15 - Concrete, Subsection 2.15.3 - Modifications, Page II-26:

Delete from **Subsection 2.15.3, Reference Number D 16.8** together with its paragraphs in their entirety:

Substitute the following:

D 16.8 Responsibilities and Duties of Contractor - ADD the following:

The Contractor may, if the Contractor so desires, take cylinders corresponding to those taken by the Engineer for the City Retained Laboratory. However, determination of payment will be based solely on the cylinders taken by the Engineer for the City Retained Laboratory.

CONCRETE TEST CYLINDERS

The Contractor will be responsible for safe delivery of concrete cylinders to the Department of Design and Construction Laboratory, within two (2) days after molding, where they will be properly stored and cured until the date of test, and tested by others, upon removal from the curing room. The Department of Design and Construction testing laboratory will provide the services for the curing and breaking of the test cylinders.

The Contractor shall provide empty cylinder molds and facilities for the proper care of these cylinders while on the site, and shall safeguard them against injury and protect them from the elements.

The Engineer will be responsible for the preparation, documentation and labeling of the cylinders and for notifying the Contractor, at least twenty-four (24) hours in advance, when a shipment of cylinders is ready for delivery, so that cylinders can be tested for the standard twenty-eight (28) day and seven (7) day tests. Cylinders are to be delivered by the Contractor to a designated area near 30-30 Thomson Avenue, Long Island City, New York, or where otherwise directed within the City of New York.

The Contractor shall make arrangements to protect all cylinders from damage during loading, transport to, and unloading at a Department of Design and Construction designated testing laboratory, and shall obtain a receipt for delivered cylinders, which shall be submitted to the Engineer.

(13) Refer to Section 4.06 - Backfilling, Subsection 4.06.3 - Method Of Depositing All Backfill, Page IV-18:

(A) Add the following paragraph to beginning of **Subsection 4.06.3:**

At the preconstruction meeting, the Contractor shall submit for approval a full description of the Contractor's proposed methods to be used for all backfilling operations including, but not limited to, equipment, backfill material, depth of compaction layers, and trench locations where each is to be employed. In the field, the Contractor shall be required to demonstrate that the Contractor's methods of backfilling and compaction shall obtain a minimum of ninety-five (95) percent of Standard Proctor Maximum Dry Density.

(B) Delete from **Subsection 4.06.3**, the fourth paragraph in its entirety:
Substitute the following:

Unless otherwise approved in writing by the Engineer, backfilling of the remainder of the trenches and excavations from a point not less than two (2) feet above the top of the sewer conduit (i.e. sewer pipes on cradles or encasements, reinforced concrete sewers, basin and house connections, culverts, etc.) to the underside of the pavement shall be progressively deposited in uniform and successive horizontal layers not exceeding twelve (12) inches in depth for the entire width of the trench or excavation and each successive layer shall be solidly compacted by mechanical tamping or other approved means so as to achieve the required density. In deep trenches defined as those requiring sheeting, the Contractor may submit to the Engineer, for approval, an alternate backfill method (i.e. jetting, deeper deposited layers not exceeding twenty-four (24) inches, etc.) for depositing and compacting the backfill from two (2) feet above the top of the sewer conduit to a plane five (5) feet below final surface elevation. However, approval of any alternate backfill method shall not relieve the Contractor from obtaining a minimum of ninety-five (95) percent of Standard Proctor Maximum Dry Density. Should the Engineer determine that the specified density is not being obtained, the area must be re-excavated and backfilled at the Contractor's own cost until the required compaction density is achieved.

(C) Delete from **Subsection 4.06.3**, the seventh paragraph in its entirety:
Substitute the following:

Backfill shall proceed simultaneously with the withdrawal of sheeting but at no time shall the withdrawal of sheeting exceed a height of six (6) inches above the deposited backfill. Withdrawal of sheeting below levels previously backfilled and compacted is prohibited.

(14) Refer to Section 5.01 - Reinforced Concrete Sewers, Subsection 5.01.4 - Precast Reinforced Concrete Sewer, Paragraph (C) - Details, second paragraph, first line, Page V-4:

Change the words "C789 or C850 (as required)", to "C1433":

(15) Refer to **Section 5.05C - Reconstruction Of Existing Sewers Using D.E.P. Approved Cured-In-Place-Pipe (CIPP) Lining Method, Subsection 5.05C.6 - Separate Payment**, third paragraph, second line, Page V-49

Change the word, "nine", to "eleven":

(16) Refer to **Section 5.11 - Outfall Structures, Subsection 5.11.2 - Materials**, Page V-95:

Delete from **Subsection 5.11.2**, paragraph (A) in its entirety:

Substitute the following:

(A) Concrete used for outfall structure (including headwalls, reinforced concrete sewer outfalls, cradles and encasements, chambers, manholes and catch basins) shall comply with the requirements of **General Specification 11 - Concrete, as modified in Section 2.15**; and, shall contain entrained air of six percent (6%), and a corrosion inhibitor. The corrosion inhibitor shall consist of a calcium nitrite solution, containing 30 ±2% calcium nitrite solids by weight and having a specific gravity of 1.27 ±0.02. The corrosion inhibitor when used in the manufacturing process shall not produce a significant amount of chloride ions in the final product (less than 1,000-ppm). The ph shall be greater than 8. The admixture shall not contain chemicals that produce a condition injurious to the quality and durability of the concrete or reinforcing steel. Calcium nitrite, which acts as an accelerator, may be used in conjunction with compatible retarding admixtures to control setting time and workability of the concrete, consult the manufacturer of the product. The corrosion inhibitor must be added to the mix immediately after air entraining and retarding admixtures have been introduced into the batch. Acceptance of calcium nitrite based corrosion inhibitor shall be based upon it being listed in the most current New York State Department of Transportation's "Approved List Of Calcium Nitrite Based Corrosion Inhibitors".

(17) Refer to **Section 5.12 - Modification Of Existing Structures**, Page V-97:

Delete **Section 5.12**, in its entirety:

Substitute the following new **Section 5.12**:

SECTION 5.12 MODIFICATION OF EXISTING STRUCTURES

5.12.1 DESCRIPTION

Existing chambers, siphon chambers, manholes, drop-pipe manholes, catch basins, outfalls and other kinds of existing structures shall be modified in accordance with the contract drawings within the limits and to the sizes, shapes and dimensions and to the elevations shown, complete.

5.12.2 MATERIALS

(A) Concrete shall comply with the requirements of **General Specification 11 - Concrete, as modified in Section 2.15**. Concrete used in existing outfall structures shall comply with **Subsection 5.11.2 (A)** as amended in this addendum.

(B) Brick and brick masonry shall comply with the requirements of **Section 2.16**.

(C) Frames, covers, gratings and hoods shall be of cast iron, unless otherwise shown on the contract plans, complying with the requirements of **Section 2.08**, Type 1. Malleable iron or cast steel covers and gratings, when required, shall comply with the requirements of **Section 2.08** and **Section 2.12**.

(D) Steps shall be cast iron and shall comply with the requirements of **Section 2.08**, Type 1, or shall be copolymer polypropylene plastic manhole steps with one-half (1/2) inch Grade 60 steel reinforcement and shall comply with the Sewer Design Standards.

- (E) Hooks shall be of stainless steel one-half (1/2) inch square bar stock, and shall be 18-8 stainless steel Type 303, complying with the requirements of ASTM A582. All other approved hangers together with fasteners shall be 18-8 stainless steel Type 303, complying with the requirements of ASTM A582.
- (F) Cement mortar shall comply with the requirements of **Section 2.17**. Cement used in existing outfall structures shall comply with **Subsection 5.11.2 (D)**.
- (G) Reinforcement shall comply with the requirements of **General Specification 11 - Concrete, as modified in Section 2.15**.
- (H) Structural steel shall comply with the requirements of **Section 2.19**.
- (I) Cast iron pipe shall comply with the requirements of **Section 2.03**.
- (J) Vitrified clay pipe shall comply with the requirements of **Section 2.02**.
- (K) Ductile iron pipe shall comply with the requirements of **Section 2.06**.
- (L) Bluestone shall be tough, sound, durable, fine graded sandstone or quartzite, free from injurious seams and other imperfections and saw cut to the required dimensions. It shall be set in a full bed of fresh mortar in compliance with the requirements of **Section 2.17**.
- (M) Granite slabs shall comply with the requirements of **Section 2.11**.
- (N) Aluminum floor gratings shall comply with the requirements of **Section 2.14**.
- (O) Timber and lumber shall comply with the requirements of **Section 2.20**. Timber columns for supports shall have a minimum (Extreme Fiber in Bending) $F_b = 1,700$ -psi and a minimum (Compression Parallel to Grain) $F_c = 1,400$ -psi.
- (P) All materials to be used in existing outfall structures shall comply with the materials specified in **Subsection 5.11.2 - Materials**.
- (Q) (a) Steel sheet piling for use in construction applications other than those specified in **Paragraph (b)** below shall comply with the requirements of ASTM A328.
- (b) Permanent steel sheet piling for use in construction of dock walls, sea walls, bulkheads, excavations and like applications that are exposed to marine environments shall comply with the requirements of ASTM A690.
- (R) Composite Sheet Piling shall be manufactured entirely from a glass fiber reinforced polymer composite that meets or exceeds the characteristics listed in this specification. All sheet piling shall be wholly and completely manufactured in an ISO certified production facility, and shall conform dimensionally to ASTM D3917; and conform to ASTM D4385, Level I for all criteria except for the following, which shall conform to Level II:
- (a) Die Parting Line
 - (b) Exposed Underlayer
 - (c) Fiber Prominence
 - (d) Grooving
 - (e) Inclusion
 - (f) Internal Shrinkage Cracks
 - (g) Saw Burn
 - (h) Stop Marks

5.12.3 CONSTRUCTION METHODS

(A) GENERAL - The existing chambers, siphon chambers, manholes, drop-pipe manholes, catch basins, outfalls and other kinds of existing structures shall be modified in accordance with the sizes, shapes and dimensions, and to the elevations as shown on the plans or as ordered by the Engineer. All work shall be performed "in the dry".

The Contractor's means and methods of construction for the modification of existing structures shall be submitted, prior to the start of work, to the Engineer for written approval.

The Contractor shall be required to submit plans, details and other substantiating data as necessary to establish the adequacy of the Contractor's proposed means and methods of construction. These documents shall be prepared under the direction of and be signed and sealed by a Professional Engineer licensed to practice in the State of New York.

(B) GENERAL CONSTRUCTION PROVISIONS - The requirements of **DIVISION IV - GENERAL CONSTRUCTION PROVISIONS** shall apply to the work to be done hereunder.

(C) DEMOLITION WORK ON EXISTING STRUCTURES - Portion(s) of the existing structure that are specified to be demolished shall be removed within the limits shown, specified or ordered. Removal of portion(s) of structure beyond the limits shown, specified or ordered shall not be permitted unless approved in writing by the Engineer.

The Contractor shall temporarily support the existing structure with adequate shoring and bracing prior to demolition of any portion of the existing structure so as to prevent collapse to portions of the structure required to remain and to provide for safe working conditions. Prior to placing temporary shoring and bracing the Contractor shall submit to the Engineer for approval drawings together with computations signed and sealed by a New York State Licensed Professional Engineer detailing the method of temporary shoring and bracing the Contractor will utilize. The Contractor shall also include on these drawings and computations recommendations for removal of earth and other loads so as to relieve all stresses that will cause overburden to the areas of the structure that are to be demolished and rebuilt. All supports shall be placed close to the area(s) to be demolished and shall be secure and evenly spaced. (These drawing and computation requirements can be waived by written approval of the Engineer.)

All existing reinforcing bars shall be incorporated into the new modified portion of the structure(s) and shall be cut to lengths as directed in the field by the Engineer to meet minimum lap requirements and to maintain continuity of the structure. Dowelling shall be provided as shown, specified or ordered.

(D) INVERTS - Inverts of chambers, manholes, etc. 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. Inverts shall be carefully protected from all injury during the progress of the work. The inverts shall be troweled smooth.

(E) SIDE WALLS - Concrete in the side walls of chambers, manholes, etc. shall be deposited continuously to the height and to the thickness approved and for their entire length.

(F) ROOF - Concrete in the roof of chambers, manholes, etc. 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.

(G) STEPS AND LADDERS - The Contractor shall furnish and install in the chambers, manholes, etc. steps and ladders of the size, shape and spacing shown on the plans and on the Sewer Design Standards.

(H) SETTING FRAMES AND COVERS - The brick masonry or concrete for the chambers, manholes, etc. 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.

(I) **REINFORCEMENT AND STRUCTURAL STEEL** - The steel reinforcement shall be of the dimensions and shapes shown, and installed in the manner specified in **General Specification 11 - Concrete, as modified in Section 2.15**. Structural steel shall be of the shapes and sizes shown, and installed as directed.

(J) **REMOVAL OF FORMS** - Forms shall be removed in accordance with **General Specification 11 - Concrete, as modified in Section 2.15**.

(K) **BULKHEADS** - Approved construction joint bulkheads with provisions for keying and doweling for future sewers shall be provided, where shown or required.

(L) **CONNECTIONS** - All connections to chambers, manholes, etc. of existing, new or future sewers and catch basin 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.

(M) **WATERSTOPS** - Waterstops shall be provided between each successive pour in accordance with **Section 2.13**. Details shall be submitted for waterstops as part of the shop drawings.

(N) **FOOTINGS, CRADLES, ENCASEMENTS, ETC** - The concrete for the footings, cradles, encasements, etc. shall be deposited continuously for the entire cross section and for such longitudinal distances as approved.

(O) **WALLS, HEADWALLS, ETC.** - The concrete for the walls, headwalls, etc. shall be deposited continuously to the height, to the thickness and for such longitudinal distances as approved.

(P) **BOULDER PROTECTION PLACEMENT** - Boulders are placed to prevent scour and erosion at sewer outfalls. The Contractor shall remove all debris and clean and prepare the tidal flat/existing ground, and shall excavate the existing surface to the depth required in order to install the boulder protection where shown, specified or as ordered. Boulder aprons and protections shall be placed in compliance with all permits and as shown, specified or ordered. The layer of boulders shall be placed in order to obtain a minimum of voids between stones. Dropping of boulders into place will not be permitted.

(R) **STEEL SHEET PILING AND COMPOSITE SHEET PILING** - Steel Sheet Piling and Composite Sheet Piling shall be tested and installed in accordance with the manufacturer's recommendations, as directed by the Engineer, and with the applicable sections of **Section 5.22 - Piles** as determined by the Engineer.

5.12.4 PRICE TO COVER

The contract price for "MODIFICATION OF EXISTING STRUCTURES" shall be the unit price bid per each modification of existing structure and shall cover the cost of all labor, materials, plant, equipment, samples, tests and insurance required and necessary to modify the existing structure within the limits and of the sizes, dimensions and to the elevations shown, including the earth excavation of all materials of whatever nature encountered (See **Section 40.03 - Earth Excavation**); temporary shoring and bracing; temporary steel or composite sheet piling; demolition of existing structure within limits shown, specified or ordered; additional excavation required to relieve overburden; reinforcement and structural steel; all sheeting and bracing; pumping; fluming; bridging; breaking down and filling in of abandoned sewer appurtenances; connections; maintaining flow in sewers; backfilling; fill for grade; preparation of all shop drawings; obtaining of necessary permits and special construction requirements for constructing "in the dry"; 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. Included in the price hereunder shall be the cost for all labor and materials required to install granite slabs, manhole frames and covers, manhole steps; catch basin frames and gratings and all other hardware in accordance with the plans, specifications and standards, or as directed by the Engineer.

The contract price hereunder shall also include the cost of all labor and materials required to connect at the chambers, manholes, etc. all existing and new sewers and basin connections; and all required structural steel, reinforcement and bulkheads for future sewer connections, as shown on the plans or as directed by the Engineer.

In addition, included in the price hereunder shall be the cost of all labor and materials necessary to remove all specified or ordered existing sewers, manholes, bulkheads, structures, debris and appurtenances that may be in the line of the work and do all work incidental thereto, all in accordance with **Subsections 10.13 and 10.28** of the specifications and as directed by the Engineer.

Also, included in the bid price for the modification of existing outfall structure shall be the cost of all labor, materials and equipment necessary and required, within the limits of payment shown on the contract drawings, to construct permanent steel or composite sheet piling bulkheads; sewers with encasements and foundations; chambers, manholes and catch basins with foundations; headwalls and foundations; retaining walls; tide gates; bar screens (trash racks); permanent fencing; boulders for aprons and protections; all dredging required for placement of stone ballast, riprap, slope pavement aprons, boulder aprons, boulder protections, etc. No separate payment will be made for the above work.

Also, included in the bid price for the modification of existing outfall structure shall be the cost of all labor, materials and equipment necessary and required, within the limits of payment shown on the contract drawings, to furnish, deliver and place Stone Ballast; Riprap; Slope Pavements; Grouted Stone Pavements; Decking; and Hand Railing. No separate payment will be made for the above work.

5.12.5 SEPARATE PAYMENT

The Contractor is notified that payment for the cost of furnishing, delivering and placing of Timber Piles; Structural Steel H-Piles; Concrete Filled Steel Pipe Piles; Continuous Flight Auger Piles; and, Mini-Piles; within modification of existing outfall limits shall be made under the unit price bid for the respective bid items.

Payment for the cost of furnishing and placing concrete and steel reinforcing bars required to construct Concrete Pile Caps atop Steel or Composite Sheet Piling Bulkheads shall be made under Item No. 73.21AC - ADDITIONAL CONCRETE, and Item No. 73.51AS - ADDITIONAL STEEL REINFORCING BARS.

Payment for Modification Of Existing Structures will be made under the Item Number as calculated below:

The Item Numbers for Modification Of Existing Structures have eleven characters. (The decimal point is considered a character, the third character.)

- (1) The first five characters shall define Modification Of Existing Structures:

51.71

- (2) The sixth character shall define the Kind of Existing Structure being modified:

C - Chamber
 M - Manhole
 D - Drop-Pipe Manhole
 S - Siphon Chamber
 T - Interceptor Sewer Manhole
 L - Culvert Chamber
 B - Catch Basin
 N - Double Catch Basin
 F - Outfall

(3) The seventh and eighth characters shall define the Type of Structure to which the Existing Structure will be modified to (if applicable). See examples below:

- 00 - No Type
- 01 - Type 1 or Type I
- C2 - Type C-2
- 0M - Manhole
- W3 - Type 3 With Curb Piece
- X3 - Type 3 Without Curb Piece
- W0 - No Type With Curb Piece
- X0 - No Type Without Curb Piece

(4) The ninth, tenth and eleventh characters shall define either the Type of Existing Structure to be modified or the Number of the Existing Structure to be modified. See examples below:

- 000 - No Number/No Type
- 003 - No. 3
- 012 - No. 12
- 28A - No. 28A
- 001 - Type 1 or Type I
- 002 - Type 2 or Type II
- 0B2 - Type B-2
- 0W3 - Type 3 With Curb Piece
- 0X3 - Type 3 Without Curb Piece
- 0W0 - No Type With Curb Piece
- 0X0 - No Type Without Curb Piece

(5) Examples of Item Numbers together with Description and Pay Unit as provided in the Bid Schedule are provided below:

Item No.	Description	Pay Unit
51.71C00000	MODIFICATION OF EXISTING CHAMBER	EACH
51.71C00001	MODIFICATION OF EXISTING CHAMBER NO.1	EACH
51.71C00002	MODIFICATION OF EXISTING CHAMBER NO.2	EACH
51.71M00000	MODIFICATION OF EXISTING MANHOLE	EACH
51.71M00001	MODIFICATION OF EXISTING MANHOLE NO. 1	EACH
51.71M00002	MODIFICATION OF EXISTING MANHOLE NO. 2	EACH
51.71M0033A	MODIFICATION OF EXISTING MANHOLE NO. 33A	EACH
51.71M000B1	MODIFICATION OF EXISTING MANHOLE TYPE B-1	EACH
51.71D00000	MODIFICATION OF EXISTING DROP-PIPE MANHOLE	EACH
51.71D00001	MODIFICATION OF EXISTING DROP-PIPE MANHOLE NO. 1	EACH
51.71D00028	MODIFICATION OF EXISTING DROP-PIPE MANHOLE NO. 28	EACH
51.71S00000	MODIFICATION OF EXISTING SIPHON CHAMBER	EACH
51.71T00000	MODIFICATION OF EXISTING INTERCEPTOR SEWER MANHOLE	EACH
51.71L00000	MODIFICATION OF EXISTING CULVERT CHAMBER	EACH
51.71B00000	MODIFICATION OF EXISTING CATCH BASIN	EACH
51.71F00000	MODIFICATION OF EXISTING OUTFALL	EACH
51.71F00001	MODIFICATION OF EXISTING OUTFALL NO. 1	EACH
51.71F00002	MODIFICATION OF EXISTING OUTFALL NO. 2	EACH
51.71B00001	MODIFICATION OF EXISTING TYPE 1 CATCH BASIN	EACH
51.71B00002	MODIFICATION OF EXISTING TYPE 2 CATCH BASIN	EACH
51.71B02001	MODIFICATION OF EXISTING TYPE 1 CATCH BASIN TO TYPE 2	EACH
51.71B01002	MODIFICATION OF EXISTING TYPE 2 CATCH BASIN TO TYPE 1	EACH
51.71BW30X3	MODIFICATION OF EXISTING TYPE 3 CATCH BASIN WITHOUT CURB PIECE TO TYPE 3 WITH CURB PIECE	EACH
51.71BX30W3	MODIFICATION OF EXISTING TYPE 3 CATCH BASIN WITH CURB PIECE TO TYPE 3 WITHOUT CURB PIECE	EACH
51.71B0M000	MODIFICATION OF EXISTING CATCH BASIN TO MANHOLE	EACH
51.71NW00X0	MODIFICATION OF EXISTING DOUBLE CATCH BASIN WITHOUT	EACH

CURB PIECE TO DOUBLE CATCH BASIN WITH CURB PIECE

(18) **Refer to Section 5.18A - Sewer Cleaning, Subsection 5.18A.3 - Disposal, Page V-124:**

Delete from **Subsection 5.18A.3**, the first paragraph in its entirety:

Substitute the following:

All material removed from the sewers and sewer portions through the manholes under this contract shall become the property of the Contractor and shall be properly disposed of away from the site, at the Contractor's expense.

(19) **Refer to Section 5.23 - Decking, Subsection 5.23.1 - Description, Page V-161:**

Delete from **Subsection 5.23.1**, the third paragraph in its entirety:

Substitute the following:

Steel plates that are resting on pavement, that are not part of a decking system, and are used to temporarily span trenches and excavations for vehicular traffic and for pedestrian crossings and walkways shall not be included for payment under this decking section. The cost of all labor, materials, equipment, insurance and incidentals necessary to furnish, place, anchor and ramp these temporary steel plates, when and where directed, in order to comply with the requirements of the NYCDOT Office of Construction Mitigation and Coordination (OCMC) traffic stipulations, the directions of the Engineer, and the Contractor's construction operations shall be deemed included in the prices bid for all contract items of work.

(20) **Refer to Section 5.23 - Decking, Subsection 5.23.4 - Design Criteria, Page V-162:**

Add the following to **Subsection 5.23.4**:

(C) The Contractor may substitute skid resistant steel plates (Non-Skid Textured Plates) for timber mats, subject to approval in accordance with **Subsection 4.05.5**. These steel plates shall be placed flush with the existing roadway and shall be installed in compliance with the requirements of **Subsection 4.05.6(G)**.

(21) **Refer to Subsection 5.32.4 - Specific Pavement Restoration Provisions, Page V-185:**

Add the following to **Subsection 5.32.4**:

(E) Specific Pavement Restoration Provisions:

(1) In the intersection of Hunter Avenue and Kiswick Street; intersection of Hunter Avenue and Nugent Avenue; intersection of Nugent Avenue and Jefferson Avenue; Freeborn Street between culvert limits between Jefferson Avenue and Graham Boulevard; Olympia Boulevard between culvert limits between Jefferson Avenue and Graham Boulevard; and, Graham Boulevard between Patterson Avenue and Baden Place, the restoration shall be as follows:

(a) The entire width of existing roadway and six (6) inches of existing roadway subgrade shall be removed from **curb to curb** or **edge to edge** and the permanent restoration over the **entire width of roadway** shall consist of six (6) inches of Asphaltic Macadam Pavement on a sub-base course of six (6) inches of Select Granular Material (Material D only) on Plastic Filter Fabric. The above areas are approximate the actual final areas of restoration shall be determined by the Engineer.

(2) In Hunter Avenue between Kiswick Street and Nugent Avenue; Grimsby Street from proposed manhole to the stone faced concrete collar; and, Freeborn Street between Hunter Avenue and Jefferson Avenue, the restoration shall be as follows:

- (a) The permanent restoration over the **trench width and cutbacks only** shall consist of a top course of one and one-half (1-1/2) inches of binder mixture on a base course of a minimum of four and one-half (4-1/2) inches of binder mixture, to match the existing pavement as directed by the Engineer.
- (b) Finally an overlay of two (2) inches of asphaltic concrete wearing course shall be installed over the entire width of the roadway from **curb to curb** or **edge to edge** of existing roadway.
- (3) In unpaved roadways and undeveloped areas, the restoration shall be as follows:
 - (a) The Contractor shall restore the areas/roadway in kind to match final grade, as shown, specified or ordered. The cost of such restoration work shall be deemed included in the prices bid for all contract items of work. No additional or separate payment will be made for this restoration work. This restoration work shall be done to the complete satisfaction of the Engineer.
- (4) The following requirements apply:
 - (a) Before the top course is installed, an additional width of asphalt beyond the edge of new base course shall be saw-cut and removed from all edges of trenches to a depth to accommodate the specified top course and the entire area restored. This additional removal shall be in accordance with paragraph (b) below.
 - (b) Pavement excavation along with saw cutting of pavements for sewer and water main trenches shall be in accordance with **Section 5.30 - Pavement Excavation** of both the Standard Sewer Specifications and the Standard Water Main Specification.
 - (c) At locations requiring the installation of a concrete base course, a reflective cracking membrane shall be installed over joints prior to restoration, the cost of which shall be deemed included in the prices bid for all pavement restoration items. Additionally, appropriate pavement keys as described below shall be used.
 - (d) Pavement keys **Type B-1** shall be used to insure a desired four (4) inch curb reveal (two and one-half (2-1/2) inch absolute minimum). Pavement key **Type A** shall be used in all intersections. Both keys are to be per Bureau of Highways Operations Specifications and Standard Details of Construction.
 - (e) Unless otherwise specified, the cost for Proctor analyses, in-place soil density tests, tack coating, eradication of temporary roadway markings, stripping or milling of pavement keys and adjustment of city-owned castings for all roadway work shall be deemed included in the prices bid for all pavement restoration items.
 - (f) Payment for placement of temporary pavement marking shall be made under Item No. 6.49 - TEMPORARY PAVEMENT MARKINGS (4" WIDE).
 - (g) Payment for removal of existing pavement markings shall be made under Item No. 6.53 - REMOVE EXISTING LANE MARKINGS (4"WIDE).
 - (h) Payment for placement of permanent pavement marking with thermoplastic reflectorized pavement markings (crosswalk and lane dividers) shall be made under Item No. 6.44 - THERMOPLASTIC REFLECTORIZED PAVEMENT MARKINGS (4" WIDE).
 - (i) Payment for pavement restoration shall be made under the following items:

<u>Item No.</u>	<u>Item</u>	<u>Payment Description</u>
4.01 RAG	Asphaltic Macadam Pavement,	(For entire width of roadway restoration.)

	6" Thick	
4.02 AF-R	Asphaltic Concrete Wearing Course, 2" Thick	(For 2" asphaltic concrete wearing course overlay from curb to curb or edge to edge.)
4.02 CA	Binder Mixture	(For binder mixture base course over trenches and cutbacks; binder mixture top course when overlay is required; binder mixture in Type A and B Keys; and binder mixture to fill in roadway depressions and to provide a leveling course prior to overlay where ordered.)
6.67	Subbase Course, Select Granular Material	(For 6" sub-base course under entire width of roadway restoration.)
6.68	Plastic Filter Fabric	(For placement under subbase course.)

(22) **Refer to Section 5.36 - Additional Earth Excavation Including Test Pits, Subsection 5.36.4 - Price To Cover, Paragraph (3), fifth line, Page V-195:**
Change 16", to 16'.

(23) **Refer to Section 5.43 - Construction Report, Subsection 5.43.1 - Intent, Page V-201:**

(A) **Add** the following to the end of **Subsection 5.43.3(D)**:

"Movements which shall be considered include, but are not limited to, vibration-related settlements, differential settlements, settlements from dewatering, and building movement and/or rotation due to excavation or construction-related work."

(B) **Change** in **Subsection 5.43.3(F)** the words, "of construction.", to the following:

"of construction, as well as means and methods the Contractor, at the Contractor's own expense, will employ should any limits be exceeded."

(C) **Add** the following new paragraphs after **paragraph (G) of Subsection 5.43.3**:

"(H) A geotechnical data summary including assumed values for the physical and strength characteristics of the soils shown on the Record(s) of Borings, developed from, but not limited to available soil and/or rock descriptions, blow counts, and available geotechnical laboratory testing. Such physical and strength characteristics include, but are not limited to, a soil's unit weight, friction angle, cohesion, consolidation properties, and permeability/drainage properties.

(I) Engineering computations to substantiate any values stated, recommended, or defined in (C), (D) and (E), using the appropriate data from (G) and (H)."

(24) **Refer to Section 5.43A - Monitoring And Post-Construction Report, Subsection 5.43A.3 - Submissions, paragraph (A) - Monitoring Settlement, Page V-203:**

Delete from fifth paragraph of **paragraph (A)**, the first sentence in their entirety:

Substitute the following:

"Should the limit of horizontal and/or vertical movement, as set forth in the Preconstruction Report, of any building and/or structure be exceeded, the Contractor shall immediately and concurrently notify the Engineer and, at the Contractor's own expense, follow the steps included in the Preconstruction Report outlined in **Subsection 5.43.3(F)** to rectify the situation and prevent any further settlement of such building and/or structure."

D. AMENDMENTS TO THE STANDARD WATER MAIN SPECIFICATIONS

(1) **Refer to Subsection 1.06.3 - Hours Of Work, Page I-4:**

Add the following to **Subsection 1.06.3:**

- (A) **HOLIDAY CONSTRUCTION EMBARGO** - A special Holiday Construction Embargo shall be in effect on the Friday of the week preceding Thanksgiving Day week from 6:00 AM to 11:59 PM and again from the Monday of Thanksgiving Day week from 6:00 AM through January 2, at 11:59 PM. Roadway and sidewalk construction activities will be restricted during the embargo period on the streets listed below*.

Any permits issued prior to the date of this notice, for work during this embargo period on the streets listed below which do not already have the permit stipulation "410" are hereby suspended for the period noted above. All permittees must comply with this embargo unless a special waiver is granted by OCMC. Waiver requests must be filed at least thirteen (13) days before Thanksgiving Day, in the Permit Office by filing a "Request for Roadway/Sidewalk Permits During Embargo Periods" and submitting supporting documentation. Waiver requests should only be submitted for critical reasons for a specific project. If a waiver is granted, the applicant will be notified so they can apply for the approved permits. Waivers **are not** required for ongoing Building Construction Activity Permits which already include the "410" permit stipulation. Waiver request forms may be obtained at any Permit Office or on the Department of Transportation's website at:

<http://www.nyc.gov/html/dot/downloads/pdf/holidayembapp.pdf>

Prior to this embargo period all necessary measures must be taken so that all roadways and sidewalks are in proper condition to allow for the expeditious and safe movement of vehicular, bicycle and pedestrian traffic. Tool carts, cable reels, containers, and material stored on roadways must be removed during the embargo period.

The opening of utility access covers is prohibited on any of the streets noted below between the hours of 6:00 AM and midnight unless the utility or contractor files for an Emergency Authorization Number as required by section 2-07 of the Department of Transportation's Highway Rules. The planned opening of utility access covers may occur during the hours of 12:01 AM and 5:59 AM where no authorization number is required.

Temporary restoration of the streets and sidewalks and removal thereof, if required for the Holiday Embargo period, will be paid for under the appropriate scheduled items.

No extension of time due to the shutdown period will be granted to the Contractor for completion of the work.

* **Please note that this embargo only applies to NYCDOT construction permits. List of street and maps of the affected locations are available by borough on the Department of Transportation's website at: <http://www.nyc.gov/html/dot/html/motorist/trafalrt.shtml>**

(2) **Refer to Subsection 1.06.27 - Salvageable Materials, Page I-14:**

Delete the paragraph starting with the words, "No salvageable material...", and ending with the words, "...from the site.", in its entirety:

Substitute the following:

Except as specified below, no salvageable material shall be returned to the New York City Department of Environmental Protection regardless of condition. It shall become the property of the Contractor for removal and disposal, by the Contractor, away from the site.

The Contractor shall salvage and deliver to a designated NYCDEP yard all Metropolitan Valves (6" thru 20") removed during construction of the contract.

- (3) **Refer** to Standard Water Main Specifications (August 1, 2009), **Subsection 1.06.29 - Contractor To Provide For Traffic**, Page I-15:
Add the following to **Subsection 1.06.29**:

See amended Standard Sewer Specifications (August 1, 2009) **Subsection 1.06.29 - Contractor To Provide For Traffic** of this addendum.

- (4) **Refer** to **Section 1.08 - Miscellaneous Provisions**, Page I-19:
Delete Subsection 1.08.2 - Vendors in its entirety:
Substitute the following new **Subsection 1.08.2**:

1.08.2 VENDORS

Prior to starting work, the Contractor shall submit in writing to the Engineer the names of all vendors and manufacturers the Contractor intends to use. Unless otherwise specified in the contract documents or a written exception is granted by NYCDDC, the Contractor shall submit only one (1) vendor or manufacturer for each product that is to be incorporated in the contract. The use of multiple vendors or manufacturers to supply the same product will be prohibited, unless otherwise specified in the contract documents or a written exception is granted by NYCDDC. If the vendor or manufacturer is not approved, the Contractor will be notified to either submit another vendor or manufacturer, or have their proposed vendor or manufacturer submit a request for approval from NYCDDC. The Contractor will be prohibited from using the vendor or manufacturer until approval of the vendor or manufacturer has been acquired from NYCDDC.

- (5) **Refer** to **Section 1.08 - Miscellaneous Provisions**, Page I-20:
Add the following new **Subsection 1.08.7**:

1.08.7 SUBMITTAL OF SCHEDULE LOG

The Contractor's attention is directed to **Article 9 - Progress Schedule** of the Contract. The Contractor shall submit along with the proposed progress schedule the following: A schedule log in Excel Format (tied to the proposed progress schedule) indicating a description of and the schedule submission dates for all required submittals, shop drawings, approval requests, design mixes, reports, samples, etc., as required by the specifications and the terms of the contract.

- (6) **Refer** to **Section 2.15 - Concrete, Subsection 2.15.3 - Modifications**, Page II-11:
Delete from **Subsection 2.15.3, Reference Number D 3.2.1** together with its paragraphs in their entirety:
Substitute the following:

D 3.2.1 **DELETE** 3.2.1 to 3.2.9 of GS11 and **SUBSTITUTE** the following:

All concrete mix designs shall be subject to approval by DDC's Quality Assurance and Construction Safety (QACS) Bureau and in accordance with their "MIX DESIGN, LABORATORY AND PLANT APPROVAL PROTOCOL". Copies of this protocol may be obtained at the preconstruction meeting or from the Engineer. Before the Contractor begins to manufacture concrete, the Contractor shall secure DDC's QACS approval of the mix design the Contractor proposes to use.

The Contractor shall submit for this purpose a statement, in writing, of the sources of all ingredient materials, the type and brand of the cement and the number of pounds of each of the materials in a saturated surface-dry condition making up one (1) cubic yard of concrete. The range of water-cement ratios within which the concrete will be

manufactured and the method of mixing to be employed shall also be stated. The mix design submittal shall include gradation of aggregates, specific gravities of ingredients, unit weight, mix proportion for each batch (a minimum of four (4) batches except in case of precast plants where one specific mix may be proposed), compressive strength test results for each mix at 7-days, 28-days (high-early strength mixes may require 6-hours, 24-hours, 3-days and shrinkage test as per the requirements), and graphical representation of strength vs. W/C projected in hours/days.

The Contractor may submit for approval concrete mixes that (within one (1) year of the contract) have been previously approved and used on other jobs with any Bureau of the Department of Environmental Protection or the Department of Design and Construction. Such submittals shall contain evidence that the concrete mix was approved within one (1) year of this contract and shall show that the concrete will be produced at the same mix plant, that the cement and admixtures are the same type (though not necessarily the same brand), that the water/cement ratio is the same and that adjustments have been made in the mix for air content, specific gravity and gradation of the aggregates.

If the Contractor elects to submit a concrete mix that was not previously approved, the Contractor shall submit the new concrete mix in accordance with Chapters 2 and 3 of General Specification 11 as modified herein.

- (7) **Refer** to Section 2.15 - Concrete, Subsection 2.15.3 - Modifications, Page II-13:
Add to Subsection 2.15.3, before Reference Number D 8.2 the following:

D 7.3.3 **ADD** the following to Subsection 7.3.3 of GS11:

Each Portland cement concrete batching plant shall be subject to approval by DDC's Quality Assurance and Construction Safety (QACS) Bureau and in accordance with their "MIX DESIGN; LABORATORY AND PLANT APPROVAL PROTOCOL". Copies of this protocol may be obtained at the preconstruction meeting or from the Engineer. The minimum requirement for approval is that the proposed Portland cement concrete batching plant must be on the New York State Department of Transportation (NYSDOT) approved list for the current construction season.

The minimum requirement for approval of a precast concrete plant is that the proposed plant must be on the NYSDOT approved list. A waiver for this requirement may be granted by the DDC's Quality Assurance and Construction Safety (QACS) Director for special products that no NYSDOT approved plant is capable of producing.

Each Portland cement concrete batching plant shall also be subject to auditing and approval of the DDC's Director of Quality Assurance and Construction Safety (QACS). The Director of QACS may at any time discontinue the use of any previously approved equipment if nonconformance with the specifications results during the progress of the work. When the Director of QACS discontinues the use of the plant, production will not be acceptable for Department work until corrective measures satisfactory to the Director are carried out.

- (8) **Refer** to Section 2.15 - Concrete, Subsection 2.15.3 - Modifications, Page II-14:
Delete from Subsection 2.15.3, Reference Number D 16.3 together with its paragraphs in their entirety:
Substitute the following:

D 16.3 Testing Service - **ADD** the following:

The Contractor shall retain the services of an independent testing laboratory to provide for the services outlined in 16.3.1.4 to 16.3.1.11 of GS11, with the exception of those tests specified herein to be performed by the Engineer and the City Retained Laboratory.

All laboratories shall be subject to approval by DDC's Quality Assurance and Construction Safety (QACS) Bureau and in accordance with their "MIX DESIGN, LABORATORY AND PLANT APPROVAL PROTOCOL". Copies of this protocol may be obtained at the pre-construction meeting or from the Engineer. The minimum requirement for approval is that the laboratory must have the current AMRL/AASHTO R-18 accreditation in the category of service proposed and must be currently licensed by the NYC Department of Buildings (DOB).

(9) Refer to Section 2.15 - Concrete, Subsection 2.15.3 - Modifications, Page II-14:

Delete from **Subsection 2.15.3, Reference Number D 16.8** together with its paragraphs in their entirety:

Substitute the following:

D 16.8 Responsibilities and Duties of Contractor - **ADD** the following:

The Contractor may, if the Contractor so desires, take cylinders corresponding to those taken by the Engineer for the City Retained Laboratory. However, determination of payment will be based solely on the cylinders taken by the Engineer for the City Retained Laboratory.

CONCRETE TEST CYLINDERS

The Contractor will be responsible for safe delivery of concrete cylinders to the Department of Design and Construction Laboratory, within two (2) days after molding, where they will be properly stored and cured until the date of test, and tested by others, upon removal from the curing room. The Department of Design and Construction testing laboratory will provide the services for the curing and breaking of the test cylinders.

The Contractor shall provide empty cylinder molds and facilities for the proper care of these cylinders while on the site, and shall safeguard them against injury and protect them from the elements.

The Engineer will be responsible for the preparation, documentation and labeling of the cylinders and for notifying the Contractor, at least twenty-four (24) hours in advance, when a shipment of cylinders is ready for delivery, so that cylinders can be tested for the standard twenty-eight (28) day and seven (7) day tests. Cylinders are to be delivered by the Contractor to a designated area near 30-30 Thomson Avenue, Long Island City, New York, or where otherwise directed within the City of New York.

The Contractor shall make arrangements to protect all cylinders from damage during loading, transport to, and unloading at a Department of Design and Construction designated testing laboratory, and shall obtain a receipt for delivered cylinders, which shall be submitted to the Engineer.

(10) Refer to Section 4.06 - Backfilling, Subsection 4.06.3 - Method Of Depositing All Backfill, Page IV-18:

(A) Add the following paragraph to beginning of **Subsection 4.06.3:**

At the preconstruction meeting, the Contractor shall submit for approval a full description of the Contractor's proposed methods to be used for all backfilling operations including, but not limited to, equipment, backfill material, depth of compaction layers, and trench locations where each is to be

employed. In the field, the Contractor shall be required to demonstrate that the Contractor's methods of backfilling and compaction shall obtain a minimum of ninety-five (95) percent of Standard Proctor Maximum Dry Density.

(B) Delete from **Subsection 4.06.3**, the fourth paragraph in its entirety:
Substitute the following:

Unless otherwise approved in writing by the Engineer, backfilling of the remainder of the trenches and excavations from a point not less than twelve (12) inches above the top of the barrel of the water main pipe to the underside of the pavement shall be progressively deposited in uniform and successive horizontal layers not exceeding twelve (12) inches in depth for the entire width of the trench or excavation and each successive layer shall be solidly compacted by mechanical tamping or other approved means so as to achieve the required density. In deep trenches defined as those requiring sheeting, the Contractor may submit to the Engineer, for approval, an alternate backfill method (i.e. jetting, deeper deposited layers not exceeding twenty-four (24) inches, etc.) for depositing and compacting the backfill from twelve (12) inches above the top of the barrel of the water main pipe to a plane five (5) feet below final surface elevation. However, approval of any alternate backfill method shall not relieve the Contractor from obtaining a minimum of ninety-five (95) percent of Standard Proctor Maximum Dry Density. Should the Engineer determine that the specified density is not being obtained, the area must be re-excavated and backfilled at the Contractor's own cost until the required compaction density is achieved.

(C) Delete from **Subsection 4.06.3**, the seventh paragraph in its entirety:
Substitute the following:

Backfill shall proceed simultaneously with the withdrawal of sheeting but at no time shall the withdrawal of sheeting exceed a height of six (6) inches above the deposited backfill. Withdrawal of sheeting below levels previously backfilled and compacted is prohibited.

(11) Refer to **Section 5.02 - Laying Ductile Iron Pipe And Fittings, Subsection 5.02.3(F) - Bedding And Foundation Of Pipes, Page V-8:**

Delete from **Subsection 5.02.3(F)**, Paragraph (5) - Pier And Plate, in its entirety:
Substitute the following new Paragraph (5):

(5) Shallow Cover: Where mains 24-inches and smaller are laid with covers of 2'-0" or less, the Contractor shall provide protection in accordance with **Standard Drawing No. 42063-Y** or as directed by the Engineer.

Where mains 24-inches and smaller are laid with covers between 2'-6" and 2'-0", the Contractor shall provide steel plates only over the main with dimensions as shown on **Standard Drawing No. 46464-Z** or as directed by the Engineer.

Where mains 30-inches and larger are laid with covers of 2'-6" or less, the Contractor shall provide protection in accordance with **Standard Drawing No. 46464-Z** or as directed by the Engineer.

Covers over the new mains shall not be less than 1'-6".

(12) Refer to **Section 5.02 - Laying Ductile Iron Pipe And Fittings, Subsection 5.02.3 - Construction Methods, Paragraph (M) - Laying Temporary Connections, Page V-12:**

Delete Paragraph (M), in its entirety:
Substitute the following:

(M) LAYING TEMPORARY CONNECTIONS AND INSTALLING TEMPORARY CAP ASSEMBLIES AND/OR BULKHEADS

- (1) When new water mains are laid and it becomes necessary to provide a temporary connection between the existing main and new mains laid under this contract (regardless of whether the new and existing water mains are in the same trench or are offset in two different trenches), the Contractor shall, if ordered, provide all labor, equipment and facilities for laying, maintaining and removing when directed, temporary connections and appurtenances. If City forces do laying of temporary connections, the Contractor shall make all required equipment and facilities available to them. No payment will be made for providing temporary house services which may be required when making a temporary connection between the existing and new main.
 - (2)
 - (a) Temporary cap assemblies on distribution water mains (20" and less in diameter) shall consist of a 2-foot long spigot/spigot ductile iron pipe with a mechanical joint cap restrained to the pipe with a "wedge-type" retainer gland and a minimum 2-inch tap on the pipe section.
 - (b) Temporary cap assemblies on distribution water mains (20" and less in diameter) shall be restrained and braced in a manner sufficient to support system working pressures, and thrust forces.
 - (c) The 2-inch tap required as part of the temporary cap assembly is to be utilized to allow air to escape while filling the main in addition to allow for proper flushing of the main.
 - (d) Restraint and bracing as well as temporary cap assemblies/bulkheads for water mains greater than 20" in diameter shall be submitted for approval by the Engineer prior to being utilized.
- (13) **Refer to Section 5.02 - Laying Ductile Iron Pipe And Fittings, Subsection 5.02.5 - Price To Cover, Paragraph (10), Page V-16:**
Delete Paragraph (10), in its entirety:
Substitute the following:
- (10)(a) No separate or additional payment will be made to the Contractor for furnishing, delivering, installing, restraining, bracing and removing temporary cap assemblies/bulkheads for water mains as ordered by the Engineer. The costs thereof shall be deemed included in the unit prices bid for all items of the contract.
 - (b) Payment for temporary valves (i.e. construction valves) and its associated fittings ordered by the Engineer during the course of the work to be installed will be paid for at the same rates as for valves and fittings permanently installed.
 - (c) If ordered by the Engineer, removal of valves (i.e. construction valves) and its associated fittings, including their transfer and disposal shall be deemed included in the prices bid for all items of the contract. No separate or additional payment will be made for this work.
 - (d) Payment For Temporary Connections: When new mains are laid and it becomes necessary to provide a temporary connection between the existing and new mains the following method of payment shall apply: The Contractor shall be paid once for furnishing and delivering pipes and fittings used in temporary connections. The Contractor shall also be paid for laying the temporary pipe connection and fitting using the appropriate pipe laying item for each time that the Contractor is directed to use them throughout the project as directed by the Engineer.
- (14) **Refer to Subsection 5.04.4 - Furnishing, Delivering And Installing Steel Tee, Paragraph (5), Item Numbers list, Page V-23:**
Delete Item No. "60.23ST20T48", together with Description "FURNISHING, DELIVERING AND INSTALLING 48-INCH X 20-INCH STEEL TEE", and Pay Unit "EACH":

- (15) **Refer to Section 5.05 - Furnishing And Delivering Gate Valves, Page V-35:**

(A) Delete from **Subsection 5.05.1 - Description**, the first paragraph in its entirety:
Substitute the following:

This specification describes furnishing and delivering of double disc 3-inch to 20-inch gate valves, resilient seated 3-inch to 20-inch gate valves and resilient seated 3-inch to 12-inch tapping valves.

Unless otherwise specified in the contract documents or ordered in writing by the Engineer, only resilient seated gate valves and tapping valves shall be furnished and delivered by the Contractor on the contract.

(B) Delete from **Subsection 5.05.2 - Materials**, second paragraph, first line, the words, "6-inch hydrant":
Substitute the following words, "3-inch to 20-inch":

(16) Refer to **Section 5.06 - Setting Gate Valves**, Page V-38:

(A) Delete from **Subsection 5.06.1 - Description**, the first paragraph in its entirety:
Substitute the following:

This specification describes the installation of double disc 3-inch to 20-inch gate valves, resilient seated 3-inch to 20-inch gate valves and resilient seated 3-inch to 12-inch tapping valves. It also describes the installing of manhole frames (skirts and heads) and covers.

Unless otherwise specified in the contract documents or ordered in writing by the Engineer, only resilient seated gate valves and tapping valves shall be installed by the Contractor on the contract.

(B) Delete from **Subsection 5.06.2 - Materials**, second paragraph, first line, the words, "6-inch hydrant":
Substitute the following words, "3-inch to 20-inch":

(17) Refer to **Section 5.23 - Decking, Subsection 5.23.1 - Description**, Page V-73:

Delete from **Subsection 5.23.1**, the third paragraph in its entirety:
Substitute the following:

Steel plates that are resting on pavement, that are not part of a decking system, and are used to temporarily span trenches and excavations for vehicular traffic and for pedestrian crossings and walkways shall not be included for payment under this decking section. The cost of all labor, materials, equipment, insurance and incidentals necessary to furnish, place, anchor and ramp these temporary steel plates, when and where directed, in order to comply with the requirements of the NYCDOT Office of Construction Mitigation and Coordination (OCMC) traffic stipulations, the directions of the Engineer, and the Contractor's construction operations shall be deemed included in the prices bid for all contract items of work.

(18) Refer to **Section 5.23 - Decking, Subsection 5.23.4 - Design Criteria**, Page V-74:

Add the following to **Subsection 5.23.4**:

(C) The Contractor may substitute skid resistant steel plates (Non-Skid Textured Plates) for timber mats, subject to approval in accordance with **Subsection 4.05.5**. These steel plates shall be placed flush with the existing roadway and shall be installed in compliance with the requirements of **Subsection 4.05.6(G)**.

(19) Refer to Standard Water Main Specifications (August 1, 2009), **Section 5.32 - Final Restoration Of Pavements**, Page V-99:

Add the following to **Subsection 5.32.4 - Specific Pavement Restoration Provisions**:

See amended Standard Sewer Specifications (August 1, 2009) **Subsection 5.32.4 - Specific Pavement Restoration Provisions** of this addendum.

**(20)Refer to Section 5.36 - Additional Earth Excavation Including Test Pits, Subsection 5.36.4 - Price To Cover, Paragraph (3), fifth line, Page V-114:
Change 16", to 16'.**

E. SPECIAL PROVISIONS

The following shall become a part of and apply to the contract:

- (A) VEHICLES. The Contractor shall be required to furnish two (2) vehicle to be used by New York City Department of Design and Construction (DDC) personnel as assigned by the Deputy Commissioner of the Department, during the life of the Contract. No direct payment will be made for the vehicle(s), or associated costs. All costs shall be deemed to be included in all scheduled items.

The Contracted vehicle(s) shall be a new small SUV hybrid vehicle as approved by DDC's Director of Fleet Administration; and shall be equipped with a standard equipment package, and meet the following minimum specification:

- (1) Engine: Manufacturer's Standard 4 cylinder.
- (2) Transmission: Automatic.
- (3) Drive: Manufacturer's Standard 4 wheel drive.
- (4) Steering: Power.
- (5) Air Conditioning.
- (6) Body: 4 Doors.
- (7) Color: Manufacturer's Standard White.
- (8) Mirror: Left and Right.
- (9) Radio: AM/FM.
- (10) Electric Rear Defogger.
- (11) Brakes: Anti-Lock.
- (12) Air Bag: Dual
- (13) Anti-theft device (optional).
- (14) Power Windows and Locks.
- (15) Two sets of keys.
- (16) GPS navigation.
- (17) Hands-free telecommunication technology.
- (18) Fire Extinguisher.
- (19) First Aid Kit.
- (20) Any additional equipment will not be accepted by DDC.

The Contractor shall provide fuel, oil, proper maintenance, tires and replacement parts, to keep the vehicle(s) in a safe operating condition, and shall undertake all repairs, including repairs arising from vandalism, accidents, or other damages. A Gas Company Card shall be furnished with each vehicle for fueling purposes. In the event that any vehicle requires maintenance or repairs which cannot be completed the same day, a comparable replacement vehicle shall be provided while the vehicle is out of service. If the vehicle is lost or stolen, the Contractor shall replace the vehicle within five (5) business days with a comparable vehicle.

The vehicle(s) shall be provided for the entire duration of this Contract, and shall be returned to the Contractor within thirty (30) days after final acceptance of work or twelve (12) months after substantial completion, whichever comes first. Contractor owned/leased vehicle(s) provided pursuant to this contract shall remain the property of the Contractor/Leaser throughout the contract period, and shall be registered in the City's name. If leased vehicles are provided, the Contractor shall obtain from the leasing company the necessary documents allowing the vehicle(s) to be registered as an official City of New York vehicle(s). The Contractor shall provide insurance for vehicle(s) as set forth in Schedule "A".

Within five (5) business days of receipt of notice to provide specified vehicle(s), the Contractor shall make the vehicle(s) available for inspection by Fleet Administration. Upon determination by Fleet Administration that the vehicle(s) satisfy requirements, the Contractor shall make arrangements through DDC's Fleet Administration for delivery to the DDC. The Contractor shall submit to Fleet Administration a signed MV-82 Part 10 authorizing registration in the City's name together with, in the

case of a previously unregistered vehicle, the manufacturer's certification of origin or, in the case of a currently registered vehicle, a copy of the title.

All required transmittals to Fleet Administration shall be made as follows:

Agency Fleet Administrator
NYC Department of Design and Construction
30 - 30 Thomson Avenue, 4th Floor
Long Island City, New York 11101
Telephone No.: (718) 391-1852

When vehicles are no longer required under this contract, as described above, they shall be de-registered by the City and promptly returned to the Contractor.

- (B) **PRICES TO INCLUDE:** No direct payment will be made for costs incurred in complying with the foregoing Special Provisions, unless otherwise provided. Said costs will be deemed to have been included in the prices bid for all the scheduled contract items.

END OF ADDENDUM NO. 2

This Addendum consists of twenty-nine (29) pages plus two (2) pages of attachments.

NO TEXT ON THIS PAGE



Department of Transportation

JANETTE SADIK-KHAN, Commissioner

OCMC TRAFFIC STIPULATIONS

11.08.13

OCMC FILE NO: REC-13-412
 CONTRACT NO: SE200R
 PROJECT: THE CONSTRUCTION OF STORM, SANITARY SEWERS, WATER MAIN AND APPURTENANCES
 LOCATION(S): SEVERAL LOCATIONS STATEN ISLAND

PERMISSION IS HEREBY GRANTED TO THE NEW YORK CITY DEPARTMENT OF DESIGN AND CONSTRUCTION, AND ITS DULY AUTHORIZED AGENT, TO ENTER UPON AND RESTRICT THE FLOW OF TRAFFIC AT THE ABOVE LOCATION AND ITS LOCAL ADJACENT STREETS FOR THE PURPOSE OF CARRYING OUT THE ABOVE NOTED PROJECT, SUBJECT TO THE STIPULATIONS, AS NOTED BELOW:

A. SPECIAL STIPULATIONS

1. **BIKE LANES** – IF WORK IS IN OR AFFECTING A BIKE LANE, THE CONTRACTOR MUST POST ADVANCE WARNING SIGNS 350 FEET AND 200 FEET PRIOR TO THE WORK ZONE STATING "CONSTRUCTION IN BIKE LANE AHEAD PROCEED WITH CAUTION", AND ALSO POST A SIGN AT THE WORK ZONE STATING "CONSTRUCTION IN BIKE LANE PROCEED WITH CAUTION". SUCH SIGNS SHALL BE ORANGE, 3' X 3', DIAMOND-SHAPED WITH 4" BLACK LETTERING. SIGNS SHALL BE POSTED IN ACCORDANCE WITH THE FEDERAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. **BUS STOPS** – THE CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO NYC DOT OCMC AND NEW YORK CITY TRANSIT (NYCT) A MINIMUM OF FIVE (5) WEEKS IN ADVANCE FOR LANE/STREET CLOSURES THAT AFFECT BUS ROUTES/BUS STOPS.
3. **ACCESS TO ABUTTING PROPERTIES** – THE CONTRACTOR SHALL COORDINATE ALL ACTIVITIES WITH ABUTTING PROPERTY OWNERS TO ENSURE ACCESS IS PROVIDED TO/FROM ENTRANCES/DRIVEWAYS AT ALL TIMES.
4. **AUTHORIZED PARKING** – PRIOR TO PERFORMING WORK WHICH IMPACTS AUTHORIZED PARKING, THE CONTRACTOR SHALL SUBMIT IN WRITING, AND COPY OCMC-STREETS, A REQUEST TO OCCUPY SPACE CURRENTLY USED BY AUTHORIZED VEHICLES. APPROVAL MUST BE RECEIVED FROM AUTHORIZED PARKING PRIOR TO OCCUPYING THESE AREAS.
5. **NOTIFICATION** – THE CONTRACTOR MUST AT LEAST TWO (2) WORKING DAYS BEFORE THE START OF CONSTRUCTION NOTIFY THE NYC FIRE DEPARTMENT, NYC POLICE DEPARTMENT, NYCEMS, LOCAL COMMUNITY BOARD, BOROUGH PRESIDENT'S OFFICE-CHIEF ENGINEER, NYCDOT OCMC OFFICE, AND ALL ABUTTING PROPERTY OWNERS.
6. **ENHANCED MITIGATIONS**
 - o "NO STANDING ANYTIME-TEMPORARY CONSTRUCTION" SIGNS AND TEMPORARY PAVEMENT MARKINGS SHALL BE INSTALLED AND MAINTAINED AS WARRANTED BY THE MAINTENANCE AND PROTECTION OF TRAFFIC (MPT) REQUIRED TO FACILITATE TRAFFIC MOVEMENTS THROUGH THE WORK ZONE. ALL TEMPORARY SIGNS AND PAVEMENT MARKINGS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
 - o COMMUNITY OUTREACH SHALL BE PROVIDED FOR THE DURATION OF THE PROJECT.

B. MAINTENANCE AND PROTECTION OF TRAFFIC

1. **HUNTER AVENUE BETWEEN KISWICK STREET AND NUGENT AVENUE**
 2. **KISWICK STREET BETWEEN HUNTER AVENUE AND BEDFORD AVENUE**
 3. **NUGENT AVENUE BETWEEN HUNTER AVENUE AND BEDFORD AVENUE**
 4. **INTERSECTION JEFFERSON AVENUE AND NUGENT AVENUE**
 5. **INTERSECTION JEFFERSON AVENUE AND FREEBORN STREET**
 6. **INTERSECTION JEFFERSON AVENUE AND OLYMPIA BLVD**
 7. **GRAHAM BLVD BETWEEN BADEN PLACE AND PATTERSON AVENUE**
- Work hours shall be as follows: 7:00 AM to 6:00 PM Monday to Friday.
 - The Contractor shall maintain one 11 foot lane on one-way streets and two 11 foot lanes on two-way streets.

C. GENERAL NOTES


1. **THIS IS NOT A PERMIT.** THIS STIPULATION SHEET MUST BE SUBMITTED WITH ALL REQUESTS FOR PERMITS PERTAINING TO THE ABOVE CONTRACT AND PRESENT AT THE WORK SITE ALONG WITH ALL ACTIVE CONSTRUCTION PERMITS WHEN THE APPROVED WORK IS BEING PERFORMED.

1 of 2

2. ALL RELOCATION WORK BY THE UTILITIES SUCH AS; CON EDISON, TELEPHONE, GAS AND CABLE COMPANIES SHALL PRECEDE THE CONTRACTORS' START OF WORK ON ALL AFFECTED ROADWAYS IN THE IMPACTED CONTRACT AREA.
3. THE CONTRACTOR IS ADVISED THAT OTHER CONTRACTORS MAY BE WORKING IN THE GENERAL AREA DURING THE TERM OF THIS STIPULATION. IN WHICH EVENT, THE CONTRACTOR MAY REQUIRE MODIFICATIONS BY THE OCMC-STREETS.
4. THE PERMITEE IS NOT AUTHORIZED TO ENTER, OCCUPY OR USE ANY PUBLICLY-OWNED OR PRIVATELY OWNED, NON-PAVED, LANDSCAPE OR NON-LANDSCAPED LOCATION WITHOUT SPECIFIC WRITTEN PERMISSION. WHEN THE LOCATION IS WITHIN THE RIGHT-OF-WAY OF A LIMITED-ACCESS ARTERIAL HIGHWAY, WRITTEN APPROVAL FROM THE NYCDOT OCMC-HIGHWAYS IS REQUIRED. WHEN THE LOCATION IS WITHIN THE RIGHT-OF-WAY OF A PUBLIC STREET OR PUBLIC PARK, WRITTEN APPROVAL FROM THE NEW YORK CITY DEPARTMENT OF TRANSPORTATION OR NEW YORK CITY DEPARTMENT OF PARKS AND RECREATION IS REQUIRED. WHEN THE LOCATION IS WITHIN THE RIGHT-OF-WAY OF ANY OTHER JURISDICTION SUCH AS PRIVATE PROPERTY, STATE, FEDERAL ETC., IT IS THE PERMITEE'S RESPONSIBILITY TO DETERMINE THE PROPERTY OWNER AND OBTAIN THE WRITTEN APPROVAL.
5. THE PERMITEE SHALL ADHERE TO THE NYCDOT BUREAU OF BRIDGES' SPECIAL PROVISIONS FOR LANDSCAPE PROTECTION, MAINTENANCE AND RESTORATION, ITEMS 1.18.15 THROUGH 1.18.19, WHENEVER AND WHEREVER ANY OF THE PERMITEE'S ACTIVITIES OCCUR WITHIN A LIMITED ACCESS ARTERIAL HIGHWAY RIGHT - OF - WAY.
6. NO DEVIATION OR DEPARTURE FROM THESE STIPULATIONS WILL BE PERMITTED WITHOUT THE PRIOR WRITTEN APPROVAL FROM THE OCMC-STREETS. REQUEST FOR SUCH MODIFICATIONS SHALL BE SUBMITTED TO THE OFFICE OF THE OCMC-STREETS, NEW YORK CITY DEPARTMENT OF TRANSPORTATION, A MINIMUM OF TWENTY (20) DAYS IN ADVANCE FOR CONSIDERATION.
7. FOR THIS PROJECT THE CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN ALL NECESSARY ADVANCE WARNING AND DETOUR SIGNS, TEMPORARY CONTROL DEVICES, BARRICADES, LIGHTS AND FLASHING ARROW BOARDS IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," THE TYPICAL SCHEMES INCLUDED IN THIS SPECIFICATION; AND AS ORDERED BY THE ENGINEER-IN-CHARGE AND THE OCMC-STREETS.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING HIS CONSTRUCTION SIGNAGE. THE IDENTIFICATION SHALL INCLUDE THE CONTRACTOR'S NAME, SPONSORING AGENCY NAME AND THE CONTRACT NUMBER. THE IDENTIFICATION SHALL BE PLACED ON THE BACK OF THE SIGN. THE LETTERING SHALL BE THREE (3) INCHES HIGH.
9. THE OCMC-STREETS RESERVES THE RIGHT TO VOID OR MODIFY THESE STIPULATIONS SHOULD CONSTRUCTION FAIL TO COMMENCE WITHIN TWO (2) YEARS OF THE SIGNED DATE OF THESE STIPULATIONS.
10. THE CONTRACTOR MUST COMPLY WITH ALL CONSTRUCTION EMBARGOS ISSUED BY THE NYCDOT INCLUDING THE HOLIDAY EMBARGO.



JOSEPH P. NOTO
EXECUTIVE DIRECTOR
OCMC-STREETS



IRMA TIAGUNSKY
PROJECT MANAGER
OCMC-STREETS

ATTACH TO CONTRACT DOCUMENTS

**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
INFRASTRUCTURE DIVISION
BUREAU OF DESIGN**

PROJECT ID: MIBBNC001

FOR THE CONSTRUCTION OF STORM SEWERS AND APPURTENANCES IN:

KISWICK STREET BETWEEN HUNTER AVENUE AND BMP NC-7; NUGENT AVENUE BETWEEN HUNTER AVENUE AND BMP NC-7; JEFFERSON AVENUE BETWEEN NUGENT AVENUE AND BMP NC-7; GRIMSBY STREET BETWEEN A POINT APPROXIMATELY 150-FEET EAST OF GRAHAM BOULEVARD AND BMP NC-7; HUNTER AVENUE BETWEEN KISWICK STREET AND NUGENT AVENUE; FREEBORN STREET BETWEEN BMP NC-7 AND BMP NC-8; FREEBORN STREET BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; OLYMPIA BOULEVARD BETWEEN BMP NC-8 AND BMP NC-9; OLYMPIA BOULEVARD BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; GRAHAM BOULEVARD BETWEEN BMP NC-9 AND BMP NC-17; AND, GRAHAM BOULEVARD BETWEEN PATTERSON AVENUE AND BADEN PLACE

INCLUDING WATER MAIN WORK

**Together With All Work Incidental Thereto
BOROUGH OF STATEN ISLAND**

ADDENDUM NO. 3

DATED: April 4, 2014

This Addendum is issued for the purpose of amending the requirements of the Contract Documents and is hereby made part of said Contract Documents to the same extent as if it was originally included therein.

GAS COST SHARING (EP-7) STANDARD SPECIFICATIONS

**EP-7 GAS COST SHARING
STANDARD SPECIFICATIONS**

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V - PRELIMINARY GAS WORK TO BE PERFORMED BY FACILITY OPERATOR

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I - NOTICE TO ALL BIDDERS; GAS COST SHARING WORK

All prospective bidders are hereby advised that, pursuant to the "Gas Facility Cost Allocation Act", ("the Act"), the City of New York has entered into an agreement ("the Agreement") with the gas companies (Con Edison or National Grid (formerly KeySpan Energy Delivery)) operating in their respective areas of the City to "share" the cost of facility relocation and/or support and protection of facilities disturbed by proposed water and/or sewer and related City work specified in this contract. Therefore, bid items, specifications and estimated quantities for the incremental costs of support and protection of certain gas facilities have been included in this contract. The low bid for this contract shall be determined by examining each bid for all work to be performed under this contract including any work of support and protection of gas facilities to be performed. The Contractor shall not seek additional compensation from gas companies except as specifically set forth in its contract.

II - GENERAL PROVISIONS; GAS COST SHARING WORK

1. General:

The Contractor shall perform City work with interferences from existing live and abandoned gas facilities. This shall be defined as utility work. Therefore, this contract includes bid items, specifications and estimated quantities designed to fully compensate him/her for the incremental costs of supporting, protecting, providing accommodations and, avoiding disturbing gas facilities located in the streets shown on the contract drawings. In the event that any other provisions of this contract related to gas facilities (or private utilities) conflict with these provisions, these provisions shall supersede and govern all work related to gas facilities owned by the companies operating in the project area. All utility work, as defined in these specifications, including changes and additions thereto shall be paid solely by the City except when specified otherwise in this contract. Contractor hereby agrees that the facility operator shall not be liable to pay him/her for any work performed including extra utility work. Contractor agrees that its bid prices include all compensation for loss of productivity and efficiency, idle time, delays (including any delays occasioned by negotiation of a contract change), change in operations, mobilization, demobilization, remobilization, added cost or expense, lost of profit, other damages or impact costs that may be suffered by or because of utility work, or the presence of gas facilities in the proximity of City work and that it will not seek additional compensation for these items. All disputes shall be resolved as specified in the contract.

Pursuant to the Act, Agreement, and the New York City Administrative Code, the gas company(ies) has been directed by the Commissioner and is required to perform all maintenance, repairs, replacement, shifting, alteration, relocation, and/or removal work that are not part of this contract. By having bid on this contract, the Contractor understands and agrees that the Commissioner has preasserted any right the City has to require, including the issuance of any directives or so called "order outs" under the New York City Administrative Code, any or all gas companies to maintain, repair, replace, protect, support, shift, alter, relocate, and/or remove all gas facilities that are about to be disturbed by the City contract work. The issuance of additional such directives during the performance of the contract work, where necessary in the sole judgment of the Commissioner, shall be initiated by such Commissioner as set forth in the relevant sections of the Act and Agreement. Contractor further agrees to insert such requirements as set forth herein above into any contracts with its approved subcontractors so that its subcontractors also understand and agree to such contract requirements.

2. Gas Interferences And Accommodations:

During the performance of sewer and water main work funded by the New York City Department of Environmental Protection (NYCDEP), as instructed by the Engineer, the use of any applicable contract bid item is allowed in order to resolve and accommodate all gas facilities interferences with such City work, including the removal of contaminated soil in associated trench excavation. This is in addition to the specified EP-7 bid items in the contract. Payment for such accommodation shall be funded by EP-7 bid item "UTL-GCS-2WS - GAS INTERFERENCES AND ACCOMMODATIONS" (F.S. Fixed Sum). The value of such accommodation shall be computed by multiplying the appropriate unit prices bid to the quantity of work performed, as determined by the Engineer, and applying the total amount thus to be paid

to EP-7 bid item "UTL-GCS-2WS - GAS INTERFERENCES AND ACCOMMODATIONS". When EP-7 bid item "UTL-GCS-2WS - GAS INTERFERENCES AND ACCOMMODATIONS" does not exist, such additional accommodation work shall be at no cost to the City but shall be a matter of adjustment between gas facility operator and Contractor. Private facilities, other than gas, that become in interference due to gas interferences accommodations shall also be accommodated, if so directed by the Resident Engineer, at no additional cost to the City and, provided that its owner agrees to be responsible for all additional costs to Contractor, otherwise, such facility shall be ordered by the City to be maintained, shifted, relocated or replaced by its owner at his/her expenses.

2a. Water Main Accommodations:

When water main construction is to be performed in this contract, Contractor shall be required, if warranted by field conditions, and at locations designated by the Resident or Borough Engineer, to change the vertical or horizontal alignment of water mains including but not limited to all additional labor, material, work method accommodations, furnishing, delivering and laying offset fittings and pipes, etc., necessary in order to complete water main installation and, avoid gas interferences in the project area, including street intersections. Typical work method accommodations shall include, but not be limited to, pier and plate, installation of filter fabric and select fill, etc. Such work shall be performed as directed by the Engineer and in accordance with contract specifications and latest edition of water mains standards and specifications.

2b. Sewer Accommodations:

When sewer construction is to be performed in this contract, Contractor shall be required, if warranted by field conditions, and at locations designated by the Resident or Borough Engineer, to change the horizontal alignment of sewer facilities (if possible) including but not limited to all additional labor, material, work method accommodations, furnishing, delivering and construction of additional manholes or modification of manholes/catch basins, extending chute connections, house connections, using alternate materials and methods, poured-in-place structures, etc., necessary in order to complete sewer installation and, avoid gas interferences in the project area, including street intersections. The term sewer facility shall include, but not be limited to, all sewer pipe and appurtenances, manholes, catch basins, catch basin chutes, etc. Such work shall be performed as directed by the Engineer and in accordance with contract specifications and latest edition of sewer standards and specifications.

3. Quantity Overruns, EP-7 Funded Bid Items:

~~No quantity overrun in excess of one hundred twenty five (125) percent, shall be permitted for EP-7 funded bid items (gas) included in this contract, except~~ when Resident Engineer determines that such overruns are caused by field modifications to planned City work, or approved construction methods, or contract scope changes. Overruns not paid by City shall be negotiated and paid to Contractor by gas facility operator who then shall be entitled to reimbursement by NYCDEP under established cost sharing procedures.

4. Changes And Extra Work:

This section is not applicable to work defined under "Emergency Reconstruction Contracts" or so-called "Where and When Contracts" since these projects, by definition, inherently encounter unanticipated gas facilities and cannot be pre-engineered. In all other cases, any contract changes proposed for City work shall also cover and include all associated changes to support and protection of gas facilities affected by such changes to City work. In all other cases where the Contractor finds that City work cannot be performed as planned and specified and/or, as approved because of a need to support, protect and/or alleviate interferences from gas facilities that were not listed and/or shown, or incorrectly shown in contract plans and specifications, he shall immediately notify the Resident Engineer and the facility operators' representative of his findings. Resident Engineer shall promptly examine such claims and determine whether or not such work is covered by contract bid items and /or specifications (contract bid items and specifications shall include city contract items as well as EP-7 items). The Resident Engineer shall also examine the claim to determine if the application of EP-7 bid item "UTL-GCS-2WS - GAS INTERFERENCES AND ACCOMMODATIONS" is appropriate to resolve the claim. If upon examination, the Engineer determines that such field conditions were unanticipated (not shown and/or listed, or incorrectly shown in contract documents) and are not covered by bid items and contract specifications, he shall then direct the Contractor and the affected facility operator to negotiate the cost of supporting and

protecting, and/or alleviating the impact on City work caused by such unanticipated gas facilities with each other with the understanding that the performance of City work shall continue during negotiations. If a cost agreement is reached, the Contractor and facility operator shall adjust such costs between themselves at no additional costs to the City contract. If the Contractor and affected facility operator do not reach an agreement concerning the price to be paid for the extra work within five (5) business days of the Engineer's directive to engage into such negotiations and, after considering: public safety and inconvenience, requirements of laws and regulations applicable to private utilities, integrity of all utility systems, including but not limited to sewer and water, gas, electric, telephone and, cable TV facilities, sound engineering practices, cost (long and short term) to all affected parties, and potential City work delays, then the Resident Engineer, depending on nature and severity of interferences with City work, shall either, direct the facility operator to relocate or replace its facilities at its own discretion and cost, reimbursable by NYCDEP under established gas cost sharing procedures or, direct the Contractor to perform the utility work on actual time, material and equipment costs basis pursuant to relevant contract requirements and amendments. Contract bid prices for any applicable items of work involved shall be applied, or converted to an allowance for time and material charges. Changes shall be for affected portions of utility work and, shall be processed with EP-7 funds.

5. Excavation:

All excavators shall notify the NYC/LI One Call Center at 1-800-272-4480 at least two (2) working days, not including the day of the call, but not more than ten (10) working days in advance of the start of any excavation work. The gas company(ies) will mark out its facilities within the project limits and provide Construction Inspector(s) during all excavation work in close proximity (within twelve (12) inches) to gas facilities. The Contractor shall exercise extreme caution when excavating in the vicinity of any gas facilities. Hand excavation shall be performed within twelve (12) inches of gas facilities. The Contractor prior to excavating underneath these facilities shall adequately support all gas facilities. Standard support details for gas facilities have been included in the specifications. Any damage to gas facilities shall be reported immediately to the gas company(ies). The Contractor shall be responsible for all cost associated with repairs made necessary by damages caused by his operations.

6. Backfilling And Street Restoration:

Backfilling operations and street restorations shall be in accordance with contract requirements.

7. Non-Responsive Bids:

Every gas (EP-7) bid item has a suggested "Not less than" value per unit indicated on contract bid sheet. Bids resulting in cost of less than suggested for EP-7 items are hereby prohibited and if submitted shall be considered NON-RESPONSIVE.

8. Minimum Clearances:

Clearance requirements for City work shall govern and supersede any clearance requirement of gas facility operator. Therefore, a minimum of twelve (12) inches clearance between private utilities and City water mains, sewers or related structures to be installed in this contract shall be maintained. When this clearance is not attainable, the Resident Engineer may allow a minimum of four (4) inches clearance. With less than twelve (12) inches clearance a neoprene/polyethylene shield (to be provided by facility operator) shall be installed as part of all work item specifications. However, if Resident Engineer determines that City work cannot be performed within allowable clearance and no reasonable City accommodation (no-cost change to City work) is possible, the City shall direct the facility operator to remove, relocate, shift, or alter their facility(ies) pursuant to the New York City Administrative Code.

9. Work By Facility Operator:

The facility operator may find it necessary to perform the following types of work during performance of City work: accommodating a contractor's request for gas facilities modifications (in order to facilitate City contractor's proposed construction method) or, remedial and emergency work on gas facilities proper with their own resources and materials if an approved method of construction for City work causes unanticipated disturbances to gas facilities or, replacing defective gas facilities when they are exposed by the Contractor and their actual conditions are observable by the facility operator. Also included in the above category of defective gas facilities are: the presence of environmental contaminants attributable to

the gas facility in or around gas facilities. If such work is deemed required by the facility operator or if facility operator is directed by the City to address such deficiencies at any time during the course of construction, the Contractor shall modify the construction schedule at no cost to the City and allow the facility operator five (5) business days to perform such work without interferences. Additional costs to the facility operator (in cases of accommodations) or, Contractor (in cases of defective gas facilities) due to such gas work, if any, shall be the responsibility of the parties involved and not of the City. Such costs shall be a matter of adjustment between the Contractor and the facility operator.

10. Materials Furnished By Facility Operator:

It shall be the Contractor's responsibility to inspect material to be installed by him immediately upon delivery and advise the facility operator through its authorized representative, of all damaged materials. The Contractor at no additional costs to the City or the facility operator shall replace any material that is damaged or lost after the Contractor's inspection.

11. Liability And Insurance:

Notwithstanding the provisions of this contract, the existing division of liabilities to third parties shall remain the same as between the City and the company. Therefore, it is specifically agreed by the City, company and Contractor (by bidding on this contract) that for the purpose of any liabilities to third parties, that the City contractor performing work directly and physically relating to gas company facilities in this project, shall be deemed an agent of the company and not an agent of the City, the New York City Municipal Water Finance Authority, or the New York City Water Board. Contractor shall include the company as an additional insured on all insurance policies maintained to comply with the City's insurance requirements.

12. Width And Depth Of Excavation:

Contractor shall not be authorized to deliberately change trench or excavation widths and/or depth specified without Engineer's approval. Enlargement of any side of excavation up to eighteen (18) inches beyond pay limits (or inside face of sheeting) requested by the Contractor for the installation of certain types of sheeting may be granted. However, such enlargements or those greater than allowable shall not be approved when, in the sole judgment of the City, field conditions allow the water mains and sewer work to be performed within the limits specified and, the sole purpose of such enlargement request is to impact adjacent utilities (public or private) whose support and protection are part of this contract. Any approval shall be given at no additional cost to the City contract, including EP-7 funding, and all costs associated with unauthorized enlargements shall be the sole responsibility of the Contractor.

13. Depth And Crossing Angles Of Gas Facilities:

Where gas facilities are shown (or specified as) crossing proposed alignment of sewers, water mains, catch basins and chute connections or any other proposed excavations at specific angles (as measured off plans or sketches or specified in contract), it shall be understood that actual field measurements may deviate (plus or minus) forty-five (45) degrees from those shown or specified. The cover, or depth from street surface to top of facilities, shall be as shown or specified in contract documents, no deviation is to be assumed. Where gas facilities are not shown on contract documents, but their support and protection are otherwise included in this contract then, all references to facilities crossing at "various angles and depth" in the gas sections shall mean that such facilities are crossing sewer, water, catch basin and, catch basin chute, and other excavations at a ninety (90) degree angle to the proposed sheeting line or side of excavation (for unsheeted trenches) with an allowable deviation of forty-five (45) degrees in any direction, except for catch basin chute excavation where the allowable deviation shall be sixty (60) degrees. Where the cover is not noted or specified, the bottom face of such facilities shall be assumed to be crossing catch basin chutes at a depth of three (3) foot eight (8) inches or less from the street surface. Paragraph No. 2 above shall apply in cases of distribution water main construction. Appropriate bid items and specifications are provided for cases where angle and depth are greater than stated above. This section also applies to work defined in "Emergency Reconstruction Contracts" or so-called "Where and When Contracts". These contracts are not pre-engineered and consequently have no drawings, sketches or determined locations and so, gas facilities encountered will be crossing existing and proposed sewer, water, catch basin/catch basin chutes and all appurtenances at various angles and depths.

14. Maintenance Of Traffic For Gas Work:

All work pertaining to gas bid items and specifications shall be performed within the contract maintenance of traffic plan as specified in the contract document. The bid price for the Maintenance and Protection of Traffic shall cover all work pertaining to gas items. The City shall make compensation for additional maintenance and protection of traffic items in connection with gas item of work only when such additional work is deemed reasonable and necessary by the Resident Engineer and is approved by him prior to its performance.

15. Relocated Gas And Temporary Systems Installation:

In cases where the Contractor is allowed to select the location for temporary construction such as, installation of dewatering headers, wells, well points, etc., he shall not disturb any gas facilities shown on sketches provided in this section. The only exception shall be, if the affected gas company agrees to such relocation and provided that the cost of such relocation is a matter of adjustment between the company and Contractor, and at no cost to the City.

16. Role Of Company Inspector:

In any case in which the City elects to perform some or all support and protection work with its own employees, personnel or contractors, the facility operator shall provide onsite inspectors to approve and certify such support and protection work (exclusive of City accommodations) performed by the City's own employees, personnel, and contractors. Facility operator's inspectors are not authorized to direct City contractor during the performance of contract work. They shall act through the City Resident Engineer and provide him/her required approvals and certifications, prior to preparing partial payments of EP-7 items, in a format and frequency to be prescribed by the appropriate City Head of Construction.

17. Coordination With Gas Company:

The Contractor shall be required to notify the gas company(ies), in writing, at least two (2) weeks prior to the start of final paving in order to allow companies to complete any unfinished gas work located within the area to be paved. Every effort shall be made to maintain gas service with minimum inconvenience to the public.

III - TECHNICAL SECTION

SECTION 6.01 - Trench Crossings; Support And Protection Of Gas Facilities And Services.

1. Description:

Under this section, the Contractor shall provide all labor, materials, equipment, and incidentals required to support and/or protect the integrity of gas mains, services and appurtenances of any sizes, configurations, and operating pressures crossing trench excavations above subgrade for planned construction of sewers and water mains facilities. A gas service shall be defined as a gas pipe of three (3) inches in diameter or less branching from the main to a customer pick up point or property valve box. A gas main may be any size pipe that is part of a distribution or transmission network other than services described above. Crossings shall be defined as gas facilities spanning the width of excavation (one side to the other side). These crossings may be at various angles and depth as shown on "Gas Cost Sharing Work Standard Sketches Nos. 1 and 1A", and as specified in "General Provisions; Gas Cost Sharing Work Paragraph No. 13" and, at the locations shown or listed in contract documents. The gas company operating in the area, (facility operator), owns these facilities. The work shall be performed in accordance with contract specifications, plans, and at the directions of the Resident Engineer in consultation with the authorized representatives of the facility operator.

2. Method Of Construction:

- A. Protection: In general, the gas facilities shall be protected as required by New York State Industrial Code 753. In particular, the Contractor shall use hand excavation methods (pick and shovel or hand held power tools) directly below the pavement base to expose the gas facilities (marked out by facility operators) and to ascertain the clearances and cover of the facilities with respect to the proposed excavation. Upon exposing the affected facilities sufficiently, at the discretion of the Resident Engineer, to ascertain the foregoing, Contractor shall be permitted to proceed with a combination of hand and machine excavation, as appropriate, outside a zone of protection whose limit shall be defined as a perimeter located twelve (12) inches from the outside face of each gas facility crossings (See "Gas Cost Sharing Work Standard Sketch No. 2"). If the facilities are in direct interference with City work, meaning that "Minimum Clearances" described in "General Provisions; Gas Cost Sharing Work Paragraph No. 8" cannot be maintained, and excavation has to be temporarily or permanently abandoned then this particular location shall become a test pit and dealt with as specified in Section 6.07, and "General Provisions; Gas Cost Sharing Work Paragraphs Nos. 2 and 8".
- B. Support: Gas mains or services crossing excavations equal or less than four (4) feet wide are generally self supporting, unless field conditions as determined by the Resident Engineer require otherwise. The support requirements for gas mains and services crossing excavations greater than four (4) feet wide shall be as shown on the attached "Gas Cost Sharing Work Standard Sketch No. 1" and Contractor shall use sheeting methods that permit the maintenance of gas facilities in their existing locations and configurations. Alternate methods equivalent to those shown on the sketch or accommodations by the facility operator proposed by the Contractor in order to facilitate the execution of the specified work shall be allowable, provided that prior approval is obtained by the Contractor from the Engineer and the facility operator. The support and protection of gas facilities crossings shown on plans, drawings, listings or otherwise identified in this contract shall not be circumvented with the issuance of so called "order outs".

3. Method Of Measurement:

The Contractor shall be paid for supporting and/or protecting gas facilities crossing trench excavations under the appropriate bid items covered by this section. The Contractor shall be directly responsible to the facility operator for the total cost of using any alternate method requiring the use of resources owned by the facility operator. Regardless of the method used, the City shall pay the bid price for the appropriate support and/or protect item of work. The average rate charged by the facility operator for alternate support and protection work such as, disconnecting and reconnecting gas services is listed in attached "Schedule GCS-A".

4. Payment Restrictions:

These items shall not be paid for: gas services crossing unsheeted water main trench excavation; abandoned gas main/services identified by facility operator; gas mains/services crossing trench excavations for fire hydrant branch connections pipes, catch basins and/or chutes (sewer drain pipe), house sewer and/or water services; gas facilities encroaching any face of excavation for sewer and/or water construction, all of which are covered under other contract sections. Also this item shall not be paid for new gas mains and services crossing water trenches when trenching for such new facilities has been performed by the Contractor in common with trench excavation for City work (overlapping trench limits). The cost of supporting and protecting such gas facilities crossings shall be deemed included in the cost of trench excavation for the new gas facilities. This payment restriction shall apply even if such common trench gas excavation is not part of the contract. The prices bid for items covered by this section represent full compensation to Contractor to completely perform the work described. No other bid items shall be combined with these items in order to pay for gas main and/or services crossing excavations specified herein.

5. Method Of Payment:

Each (Ea.) gas facility crossing trench excavation as described in these specifications shall be counted for payment.

6. Price To Cover:

The cost of timber/steel supports installed for gas facilities shall be included in the bid price. The bid price for each crossing shall also cover all additional supervision, labor, material (except those provided by the facility operator), equipment and insurance necessary to completely maintain the gas facilities without disruption of service to the customers and in accordance with contract plans, specifications and facility operator standards. The price shall also include: changes of method of operations; sheeting modifications where necessary to accommodate the gas facilities crossings; installation and removal of water pipe under gas facilities (so called "snaking"); extra care during excavation (including hand excavation under existing single and multiple gas facilities); extra backfilling and compaction around, over and under gas facilities; installation and removal of sheeting around gas facilities; associated maintenance and protection of traffic; barricades; and traffic plates that may be required to temporarily close and/or complete the work.

SECTION 6.02 - Extra Excavation For The Installation Of Catch Basin Sewer Drain Pipes With Gas Interferences.

1. Description:

Under this item, the Contractor shall provide all labor, materials, equipment, insurance, and incidentals for the extra excavation associated with the installation of catch basin sewer drain pipes (chute) under gas facilities of various sizes crossing the trench excavation at various angles and depth at the locations shown in the contract documents and also, for the support and protection of these facilities during associated excavation and backfill operations. The gas company operating in the area, (facility operator), owns these facilities.

2. Method Of Measurement:

The bid price shall be per location (Each) where extra excavation is required when catch basin sewer drain pipes are installed at an upstream invert depth lower than four (4) feet (up to a maximum of six (6) feet) from the proposed pavement grade because the bottom faces of interfering gas mains and appurtenances are located at a depth greater than three (3) foot eight (8) inches from proposed pavement surface (See "Gas Cost Sharing Work Standard Sketch No. 4").

3. Method Of Construction:

Incremental cost responsibility for chute excavation is determined by the first private facility encountered starting from catch basin structure proper and that prevents the installation of the chute connection at an upstream cover less than or equal to three (3) feet or any other minimum cover required to avoid City facilities (e.g. water, sewer, etc.) as directed by the Resident Engineer.

4. Payment Restrictions:

This item shall not apply and related bid item shall not be paid in cases where:

- A. Upstream invert chute is more than six (6) feet deep because of gas facilities.
- B. Chute cannot be installed above existing gas facilities because of interferences with other private facilities that are not otherwise covered under this contract, regardless of upstream invert depth.

The above cases shall be at no cost to the City, but shall be a matter of adjustment between the Contractor and the facility operator(s).

5. Price To Cover:

The bid price shall cover the additional cost of all additional supervision, labor, materials, equipment and insurance, to complete the installation of catch basins and associated sewer connections in accordance with the contract plans and specifications. The price shall include: excavation by hand around and under single and multiple gas facilities; locating, supporting and protecting gas facilities; backfilling and all other items necessary to perform all work incidental thereto including: installation and removal of drain pipe under gas facilities ("snaking"); widening of trenches to facilitate the above work; subsequent additional

backfill and pavement restoration; modifying precast catch basin window to accommodate connection; changing sheeting method and configuration to accommodate gas facility crossings; maintenance and protection of traffic; barricades; and installation of traffic plates that may be required to temporarily close and/or complete the work. The price shall not include removal of ledge rock and/or excavation of boulders in open cut.

SECTION 6.02.1 - Extra Excavation For The Installation Of Catch Basin Sewer Drain Pipes With Upstream Inverts Greater Than Six (6) Feet.

1. Description:

Under this item, the Contractor shall provide all labor, materials, equipment, insurance and incidentals for the extra excavation of catch basin chutes where the upstream invert is greater than six (6) feet under gas facilities of various sizes crossing the trench excavation at various angles and depth at the locations shown in the contract documents or as determined by field conditions and also, for the support and protection of these facilities during the associated excavation, sheeting and backfilling operations.

2. Method Of Measurement:

The bid price shall be per location (Each) where extra excavation and sheeting is required when the catch basin chute installed at an upstream invert depth lower than six (6) feet from the proposed pavement grade because the bottom faces of the interfering gas mains and appurtenances are located at a greater depth than three foot eight inches from the proposed pavement surface only.

3. Method Of Construction:

Incremental cost responsibility for chute excavation is determined by the first private facility encountered during such excavation when initiated from catch basin structure and that prevents the installation of the chute at an upstream cover less than or equal to three (3) feet or any other cover required to avoid City facilities as directed by the Resident Engineer.

4. Payment Restriction:

This item shall not apply and related bid item shall not be paid in cases where:

Upstream invert chute is less than or equal to six (6) feet deep because of gas facilities. Section 6.02 shall be paid.

5. Price To Cover:

The bid price shall cover the additional cost of all supervision, labor, materials, equipment and insurance to complete the installation of catch basin and associated sewer connections in accordance with the contract plans and specifications. The price shall include: excavation by hand around and under single and multiple gas facilities; locating, supporting and protecting gas facilities incidental thereto; widening of trenches to facilitate the above work; subsequent additional backfilling and pavement restoration; modifying pre-cast basin window to accommodate connection; the installation of catch basin with deeper sumps as specified; additional sheeting and changes in sheeting method and configuration to accommodate gas facility crossings; maintenance and protection of traffic; barricades; and installation of traffic plates that may be required to temporarily close and/or complete the work.

SECTION 6.03 - Removal Of Abandoned Gas Facilities. All Sizes.

1. Description:

Under this section the Contractor shall provide all labor, materials, equipment, insurance and incidentals required for the removal of abandoned gas mains, services, or appurtenances thereof, located within the street shown on the contract plans, owned by gas company operating in the project area (facility operator), used or to be used for or in connection with or to facilitate the conveying, transportation, distribution or

furnishing of gas (natural or manufactured or mixture of both) for light, heat, or power, but does not include property used solely for or in connection with business of selling, distributing or furnishing of gas in enclosed containers. Such removal shall include only abandoned gas facilities that interfere with (i.e. cause additional work) City work.

2. Determination Of Operating Status Of Gas Facilities:

The Contractor shall notify facility operator, as required by New York State Industrial Code 753. Gas facilities shall not be removed without the approval of the facility operator whose authorized representative shall certify in writing (specific facility or area wide facilities certification) and in a timely manner acceptable to the Resident Engineer that abandoned facilities are free of combustible gas and any other environmental contaminants prior to removal. The Resident Engineer shall rely on facility operator's certification. The facility operator may request the excavation of test pits (See Section 6.07) for this determination ahead of City work and, Contractor shall provide safe access, facilitate and permit facility operator to enter test pit excavations for the purpose of testing gas facilities to be removed by the Contractor. However, facility operator may prefer to make this test during performance of City work, in order to issue the above certification. This shall be permitted provided that it is agreed that additional costs, if any resulting from this choice shall be a matter of adjustment between the Contractor and facility operator only, and at no cost to the City.

3. Restrictions:

The facility operator shall be solely responsible for its contaminated gas facilities, surrounding contaminated soil and their disposal and abatement procedures, unless contract bid items are applicable and provided for such work. In such cases, the quantity removed shall be charged to EP-7 bid item "UTL-GCS-2WS - GAS INTERFERENCES AND ACCOMMODATIONS" at the City bid prices.

4. Method Of Measurement:

Abandoned gas pipeline removal shall be measured for payment per linear foot of pipe and appurtenances removed.

5. Price To Cover:

The price shall cover all additional cost of supervision, labor, materials, equipment, and insurance necessary to complete this work in accordance with the contract plans and specifications, including excavation by hand around and under other City and facility operator owned properties and, where necessary, support and protection of such properties. The price shall also cover breaking, cutting, and/or burning of abandoned gas pipes and their disposal from the site; sealing open ends remaining in the excavation with concrete or caps (caps to be provided by the facility operator) and backfilling of the area where the pipeline has been removed with clean backfill. The price shall also include any required dump charges. This item does not include any type of extra excavation, backfilling, compaction, pavement removal and restoration associated with abandoned gas facilities removal, all of which are covered under Section 6.06.

SECTION 6.03.1 - Removal Of Abandoned Gas Facilities With Possible Coal Tar Wrap. All Sizes. (For National Grid Work Only)

1. Description:

Under this section the Contractor shall provide all labor, materials, equipment, insurance and, incidentals required for the removal of abandoned gas mains, services or appurtenances thereof, located within the street shown on the contract plans, owned by the gas company operating in the project area (facility operator), used or to be used for or in connection with or to facilitate the conveying, transportation, distribution or furnishing of gas (natural or manufactured or mixture of both) for light, heat, or power, but does not include property used solely for or in connection with business of selling, distributing or furnishing of gas in enclosed containers. Such removal shall include only abandoned gas facilities that interfere with (i.e. cause additional work) City work. These gas facilities may be coated with Coal Tar Wrap and so, may require special handling and disposal methods as specified in National Grid Standard Operating Procedure 12-2, Coal Tar Wrap Handling and 12NYCRR56.

2. Determination Of Operating Status Of Gas Facilities:

The Contractor shall notify facility operator, as required by New York State Industrial Code 753. Gas facilities shall not be removed without the approval of the facility operator whose authorized representative shall certify in writing (specific facility or area wide facilities certification) and in a timely manner acceptable to the Resident Engineer that abandoned facilities are free of combustible gas and any other environmental contaminants prior to removal. The Resident Engineer shall rely on the facility operator's certification. The facility operator may request the excavation of test pits (See Section 6.07) for this determination ahead of City work and, the Contractor shall provide safe access, facilitate and permit facility operator to enter test pit excavations for the purpose of testing gas facilities to be removed by the Contractor. However, the facility operator may prefer to make this test during performance of City work, in order to issue the above certification. This shall be permitted provided that it is agreed that additional costs, if any, resulting from this choice shall be a matter of adjustment between the Contractor and the facility operator only, and at no cost to the City contract. Should such investigation result in the determination that the abandoned gas facilities do not contain Coal Tar Wrap then the removal of said facilities shall be covered under separate item (See Section 6.03).

3. Requirements:

The City Contractor shall excavate abandoned gas facility sufficiently, either in its entirety, or at locations determined by Contractor to allow the removal of Coal Tar Wrap (if present on the abandoned gas facility) and to facilitate the safe extraction of manageable lengths of abandoned pipe without damage to adjacent facilities, utilities or City structures either parallel to or crossing above or below abandoned gas facility. The Contractor is to allow access to the designated cutting points within the Contractor's trench by authorized National Grid personnel who will remove the Coal Tar Wrap as per National Grid procedures. This work by National Grid personnel shall be performed in a timely fashion and shall not unduly impede the Contractor's progress and/or productivity. Upon completion of the coating removal, the Contractor shall be allowed to cut, burn or grind the gas facility and remove the section of abandoned pipe. The Contractor at a site designated by the Contractor shall stockpile the removed pipe. The facility operator will be responsible to provide trucking and disposal services with its own personnel and shall remove the stockpiled pipes during off hours or during such time as agreed to by the Contractor. Since the pipe removed will remain the property of the facility operator and is to be disposed of by the facility operator, the facility operator shall be responsible for any required notifications, filings, dump charges and incidentals associated with the disposal of abandoned gas facilities found to contain Coal Tar Wrap.

4. Method Of Measurement:

Abandoned gas pipeline removal shall be measured for payment per linear foot of pipe and appurtenances removed.

5. Price To Cover:

The price shall cover all additional cost of supervision, labor, materials, equipment and insurance necessary to complete this work in accordance with the contract plans and specifications, including excavation by hand around and under other City and facility operator owned properties and, where necessary, the support and protection of such properties. The cost shall also include hand excavation in the area(s) of proposed abandoned pipe cut(s), cutting and/or burning of abandoned gas pipes and stockpile of removed sections of abandoned pipe and associated maintenance and protection of traffic, blocking and temporary fencing if required. The unit price shall also cover sealing open ends remaining in the excavation with concrete or end caps (end caps to be provided by the facility operator) and backfilling of the area where the abandoned pipeline has been removed with clean backfill material. This item does not include any type of extra excavation, backfilling, compaction, pavement removal and/or restoration (temporary and permanent) associated with abandoned pipe removal ("lost trench"), all of which are covered under separate Section 6.06. The price shall also include allowance for any loss of productivity by the Contractor due to required facility operator work to remove pipe coating and prepare pipe for cutting as well as any change in Contractor's excavation method, additional trucking and/or stockpiling costs.

**SECTION 6.03.1a - Removal Of Abandoned Gas Facilities With Possible Coal Tar Wrap.
All Sizes. (For Con Edison Work Only)**

1. Description:

Under this section the Contractor shall provide all labor, material, equipment, insurance and, incidentals required to prepare abandoned gas mains, services and appurtenances thereof located within the street shown on contract plans, owned by the gas company operating in the project area (facility operator), for removal due to interference with proposed City work. These abandoned gas facilities were, at one time, used for or in connection with or to facilitate the conveying, transportation, distribution or furnishing of gas (natural, manufactured or a combination of both) for light, heat, or power, but does not include property used solely for or in connection with business of selling, distribution or furnishing of gas in enclosed containers. Such preparation for removal shall include only abandoned gas facilities that interfere with (i.e. cause additional work) City work. These gas facilities may be coated with Coal Tar Wrap which may contain asbestos or PCB's and so, may require special handling and disposal methods as specified in Con Edison - ASBESTOS MANAGEMENT MANUAL, CHAPTER 6 - ASBESTOS WORK PROCEDURES, SECTION 06.04 - COAL TAR WRAP REMOVAL. For under 25' (feet) in length and an approved NYC-DEP variance for over 25' (feet).

2. Determination Of Operating Status Of Gas Facilities:

The Contractor shall notify facility operator, as required by New York State Industrial Code 753. Gas Facilities shall not be removed without the approval of the facility operator whose authorized representative shall certify in writing (specific facility or area wide facilities certification) and in a timely manner acceptable to the Resident Engineer that abandoned facilities are free of combustible gas and any other environmental contaminants prior to removal. The Resident Engineer shall rely on the facility operator's certification. The facility operator may request the excavation of test pits (See Section 6.07) for this determination ahead of City work and Contractor shall provide safe access, facilitate and permit facility operator to enter test pit excavations for the purpose of testing gas facilities. However, the facility operator may prefer to make this test during performance of City work in order to issue the above certification. This shall be permitted provided that it is agreed that additional costs, if any, resulting from this choice shall be a matter of adjustment between the Contractor and the facility operator only, and at no cost the City contract. Should such investigation result in the determination that the abandoned gas facilities do not contain Coal Tar Warp then the removal of said facilities shall be covered under separate item (See Section 6.03).

3. Requirements:

The Contractor shall excavate abandoned gas facility sufficiently, either in it's entirety, or at locations determined by Contractor to allow the removal of Coal Tar Wrap (if present on the abandoned gas facility) and to facilitate the safe extraction of manageable lengths of abandoned pipe without damage to adjacent facilities, utilities or city structures either parallel to or crossing above or below abandoned gas facility. The Contractor is to allow access to the designated cutting points within the Contractors trench by authorized Con Edison personnel who will remove the Coal Tar Wrap as per Con Edison and/or NYC-DEP approved procedures. This access shall conform to all applicable codes, rules & regulations. This work by Con Edison personnel shall be performed in a timely fashion and shall not unduly impede the Contractors progress and/or productivity. Upon completion of the coating removal, the Contractor shall be allowed to cut, burn or grind the gas facility and remove the section of abandoned pipe. Contractor shall designate a specific site to stockpile those removed pipes. The facility operator will be responsible to provide trucking and disposal services with its own personnel and shall remove the stockpiled pipes during off hours or during such time as agreed to by the Contractor. Since the pipe removed will remain the property of the facility operator and is to be disposed of by the facility operator, the facility operator shall be responsible for any required notifications, filings, dump charges and incidentals associated with the disposal of abandoned gas facilities found to contain Coal Tar Wrap.

4. Method Of Measurement:

Abandoned gas facility removal shall be measured for payment per linear foot of pipe and appurtenances removed.

5. Price To Cover:

The price shall cover all additional cost of supervision, labor, materials, equipment and insurance necessary to complete this work in accordance with the plans and specifications, including, but not limited to, excavation by hand around and under other City and facility operator owned properties and, where necessary, the support and protection of such properties. The cost shall also include hand excavation in the area(s) of proposed abandoned pipe cut(s), cutting and/or burning of abandoned gas pipes and stockpile of removed sections of abandoned pipe and associated maintenance of traffic, blocking and temporary fencing if required. The unit price shall also cover sealing open ends remaining in the excavation with concrete or end caps (end caps to be supplied by facility operator) and backfilling of the area where the abandoned pipeline has been removed with clean backfill material. This item does not include any type of extra excavation, backfilling, compaction, pavement removal and/or restoration (temporary and permanent) associated with abandoned pipe removal ("lost trench"), all of which are covered under separate Section 6.06. The price shall also include allowance for any loss of productivity by the Contractor due to required facility operator work to remove pipe coating and prepare pipe for cutting as well as any change in Contractor excavation method, additional trucking and/or stockpiling costs.

SECTION 6.04 - Adjust Hardware To Grade Using Spacer Rings/Adaptors. (Street Repaving.)

1. Description:

Under this section, the Contractor shall provide all labor, supervision, materials, equipment, insurance and incidentals required to adjust to final grade gas street surface hardware located within the contract area boundaries shown on the plans. The gas company operating in the area, (facility operator), owns these facilities. The work shall be performed in accordance with the contract plans, specifications and at the directions of the Resident Engineer in concurrence with authorized representative of the facility operator.

2. Materials:

The facility operator shall furnish and deliver all prefabricated hardware parts required. These include adaptors for the grade adjustment proper and new street hardware if existing ones are found to be defective, all in accordance with the facility operator standards and City rules and regulations. The Contractor shall notify the facility operator of the installation schedule at least three (3) business days before materials are required on the site. Should the facility operator fail to deliver the necessary material according to any schedule mutually agreed upon by the Contractor and facility operator, the City shall not be responsible for any delays attributable thereto, nor for the failure of delivery of such materials. On project where material storage is not permitted on site, the facility operator shall deliver the required material to the Contractor's yard and it shall be the Contractor's responsibility to transport the material to the work site when needed for installation. It shall also be the Contractor's responsibility to inspect the materials to be installed by him immediately upon delivery and advise the facility operator through its authorized representative, of all damaged materials. The Contractor at no additional expense to the City or the facility operator shall replace any material that is damaged or lost after the Contractor's inspection.

3. Method Of Measurement:

The Contractor shall be paid for each six (6) inch round box and/or nine (9) inch square box adjusted to grade regardless of adjustment height requirements.

4. Price To Cover:

The unit price bid for this item shall include all additional labor, supervision, insurance, equipment and, material (except those to be provided by the facility operator), required to adjust each box to grade as required in the contract plans and specifications. The bid price shall also include the removal of existing frames and covers from existing facilities to be salvaged and returned to the facility operator and, all material transportation from the Contractor's material storage yard to the work site. In addition the bid price shall include "chipping" around existing box using appropriate means and methods where grinding is required.

SECTION 6.05 - Adjust Hardware To Grade By Resetting. (Road Reconstruction.)

1. Description:

Under this item, the Contractor shall provide all labor, supervision, materials, equipment, insurance and incidentals required to adjust to the proposed grade gas street surface hardware located within the contract area boundaries shown on the plans. The gas company operating in the area, (facility operator), owns these facilities. The work shall consist of either building up or lowering or resetting the casting by removing the existing frame and cover building up or decreasing the existing installation, replacing the frame and/or cover if damaged or worn out, as determined by the Resident Engineer, with a new frame and/or cover furnished by the owner, and setting the frame and cover to new elevation. The work shall be performed in accordance with the contract plans, specifications and at the directions of the Resident Engineer.

2. Materials:

The facility operator shall furnish and deliver all new hardware parts required. The Contractor shall furnish materials such as mortar, bricks and concrete in compliance with contract requirements. At locations where high-early strength concrete is required under this contract to be placed adjacent to gas facilities, then the requirement for concrete shall be high-early strength complying with the current New York State Department of Transportation, Standard Specifications for Class F concrete. Existing castings may be replaced as required and deemed necessary by the Engineer and by City rules and regulations. The Contractor shall install the new castings of various sizes furnished by the facility operator. The Contractor shall notify the facility operator of the installation schedule at least three (3) business days before materials are required on the site and, shall provide off-loading services to the facility operator. Should the facility operator fail to deliver the necessary material according to any schedule mutually agreed upon by the Contractor and facility operator, the City shall not be responsible for any delays attributable thereto, nor for the failure of delivery of such materials. Such delays shall be a matter of adjustment between the Contractor and the facility operator. On project where material storage is not permitted on site, the facility operator shall deliver the required material to the Contractor's yard and it shall be the Contractor's responsibility to transport the material to the work site when needed for installation. It shall also be the Contractor's responsibility to inspect the materials to be installed by him, immediately upon delivery and advise the facility operator through its authorized representative, of all damaged materials. The Contractor at no additional expense to the City or the facility operator shall replace any material that is damaged or lost after the Contractor's inspection.

3. Methods Of Construction:

The Contractor shall remove and reinstall existing castings or install new castings to the proposed grade. Setting and resetting the castings shall be done with mortar and brick according to the standards of the facility operator. Work shall be performed in a workmanlike manner. Castings that are deemed unacceptable for resetting shall remain the property of the facility operator and he shall be responsible for their removal and proper disposal from site. No traffic shall be allowed on adjusted street hardware until permitted by the Engineer.

4. Method Of Measurement:

The Contractor shall be paid for each gas hardware adjusted to grade regardless of size or adjustment height requirements (up or down).

5. Price To Cover:

The unit price bid for this item shall include all additional labor, supervision, insurance, equipment and material (except those to be provided by the facility operator), required to adjust each gas hardware to grade as required in the contract plans and specifications. The bid price shall also include the removal of existing frames and covers from existing facilities; building up the existing installations with bricks and mortar, or lowering the existing installation by removing bricks and mortar; replacing damaged frames and/or covers with new frames and/or covers furnished by the facility operator; setting the frames and covers to the new elevations; protect existing installations; repair minor structural damages to existing installations prior to resetting frames; unloading of furnished castings at the Contractor's yard and transporting castings from the Contractor's yard to the job site as required; completing the work in

accordance with the contract plans, specifications and, at the directions of the Engineer. In addition the bid price shall include "chipping" around existing gas facilities using appropriate means and methods where grinding is required.

SECTION 6.06 - Special Care Excavation And Backfilling.

1. Description:

Under this section, the Contractor shall provide all labor, materials, equipment, insurance and incidentals required to support and protect the integrity of live gas facilities including mains, services, related structures and appurtenances during excavations. The gas company operating in the area, (facility operator), owns these facilities. The work shall be performed in accordance with the contract plans, specifications and at the directions of the Resident Engineer in consultation with authorized representatives of the facility operator.

2. Applicability Of Section:

This section shall apply to live gas facilities of various sizes located within two (2) feet of any face of unsheeted excavation, (unsheeted excavation refers to any excavation performed for city work and includes excavations performed that are to be subsequently sheeted using approved methods) and paralleling or, encroaching any face of excavation. Also, for crossings greater than forty-five (45) degrees and/or located at a cover depth greater than five (5) feet from existing street surface. Parallel facilities are not exposed at any time during excavation (See "Gas Cost Sharing Work Standard Sketch No. 5"). Encroaching facilities are partially exposed inside the limit of excavation (See "Gas Cost Sharing Work Standard Sketch No. 5"). This section shall also apply to gas facilities crossing catch basins excavation, and catch basins sewer connections (chutes) trench excavation only when extra depth (covered in other section), is not required for chutes installations because of such utilities interferences (See "Gas Cost Sharing Work Standard Sketch No. 3"). This section shall also apply to gas services (if shown or otherwise listed in contract documents) crossing unsheeted excavations for water mains, gas facilities crossing fire hydrant branch connections, house sewer and/or water service connections excavations. This section shall also apply for so called "loss trench", as described further, and for additional excavation (pavement and/or soil), backfilling, compaction, roadway base and pavement restoration due to abandoned gas facilities, only if removed by Contractor. If operating status of gas facilities cannot be determined prior to excavation then such facilities shall be considered live and this section shall fully apply. The excavation around fully exposed live gas facilities along and within limits of excavation (not crossings) shall be covered by this section also (not shown on "Gas Cost Sharing Work Standard Sketch No. 5"), however the support requirement, if any is required, of such facilities is beyond the scope of these specifications and therefore shall be the responsibility of facility operator to determine and prescribe, at no cost to the City contract, but shall be a matter of adjustment between the Contractor and facility operator.

3. Payment Restriction:

No special care excavation shall be paid for abandoned gas facilities paralleling and/or encroaching excavation and therefore are not in direct interference with City work. Except as allowed in this section, the bid item specified under this section shall not be used in combination with items covered under other sections for work done due to a particular gas facility. This item shall not be paid for new gas facilities when trenching for such new facilities has been performed by the Contractor of record in common with trench excavation for City Work (overlapping trench limits). The cost of excavating with care as defined in this section shall be deemed included in the cost of trench excavation for the new gas facilities. This restriction shall apply even if such gas common trench excavation is not part of the contract. If facilities are in direct interference with City work, meaning that "Minimum Clearances" described in "General Provisions; Gas Cost Sharing Work Paragraph No. 8" cannot be maintained and excavation has to be temporarily or permanently abandoned then this particular location shall become a test pit and dealt with as specified in Section 6.07 and "General Provisions; Gas Cost Sharing Work Paragraphs Nos. 2 and 8".

4. Method Of Construction:

All excavation in the vicinity of gas facilities shall be as required by NYS Industrial Code 753. Where these facilities are paralleling and located two (2) feet or less from the limits of the proposed excavation, the Contractor shall use hand excavation methods (pick and shovel or hand held power tools) to ascertain

the clearances of these facilities with respect to the proposed excavation. Once the location of these facilities with respect to the proposed excavation is verified to the satisfaction of the Resident Engineer, the Contractor shall then proceed with a combination of hand and machine excavation as required preserving the integrity of the facilities. The installation of timber supports or underpinning, when soil foundation cannot fully support partially exposed pipes, may be required to prevent pipe movement as directed by the Resident Engineer.

5. Method Of Payment:

The unit price for this work item shall be based on cubic yard (CY) of average excavation with care and, is to be considered as an incremental cost for performing City work with gas facilities interferences.

6. Method Of Measurement:

- A. For Paralleling Facilities: Volume calculated as: Depth as measured from existing street surface to the bottom of unsheeted trench excavation allowable by OSHA regulations, multiplied by, the width measured as one (1) foot from the face of excavation toward the center of excavation, multiplied by the length of parallel facility, divided by twenty-seven (27) cubic feet per cubic yard (See "Gas Cost Sharing Work Standard Sketch No. 5"). The gas facility is no longer considered to be in interference once sheeting has been installed, therefore no further compensation for paralleling facilities as described above will be made.
- B. For Encroaching Facilities: Volume calculated as: Depth of trench excavation multiplied by, the width of partially exposed pipe plus one (1) foot, multiplied by the length of facility encroachment, divided by twenty-seven (27) cubic feet per cubic yard (See "Gas Cost Sharing Work Standard Sketch No. 5").
- C. Fully Exposed Gas Facilities: (Not shown on "Gas Cost Sharing Work Standard Sketch No. 5") along and inside trench and/or crossing trench at an angle greater than forty-five (45) degrees and/or a cover depth greater than five (5) feet from the existing street surface. The volume shall be measured as the depth of trench excavation multiplied by the distance measured along the sheeting line between two (2) points of intersections of the gas facilities and the sides of trench excavation, multiplied by the width of trench excavation.
- D. For Additional Excavation And Restoration Due To So Called "Loss Trench", When The Integrity Of Pavement And Soil Above And Around Existing Live Gas Facilities Cannot Be Maintained Due To Its Lack Of Cohesiveness: Volume shall be calculated as: Depth of unsheeted trench excavation multiplied by width measured as distance of facility from closest edge of unsheeted excavation plus, width of facility proper plus, one (1) foot or a maximum width of three (3) feet multiplied by length of facility fully exposed divided by, twenty-seven (27) cubic feet per cubic yard (not shown on "Gas Cost Sharing Work Standard Sketch No. 5").
- E. For Facilities Crossing Excavation For Catch Basins, Or Chutes Installations (When NYCDEP Funded) Or Fire Hydrant Branch Connections, Or Unsheeted Water Main Trench, Or House Sewer And/Or Water Services: Volume calculated as: Depth as defined above multiplied by, the width taken as the outside diameter of pipe or the width of structure plus one (1) foot on either side (two (2) feet), multiplied by, the length of exposed facility crossing the trench, divided by twenty-seven (27) cubic feet per cubic yard (not shown on "Gas Cost Sharing Work Standard Sketch No. 5").

Overlapping volume dimensions measured as described above may occur when multiple facilities are paralleling excavations, encroaching excavations or crossing catch basins and catch basin chute installations. In such cases, all such facilities shall be counted as one limited by the extreme pipes, faces (See "Gas Cost Sharing Work Standard Sketch No. 2"). The volume shall then be calculated as described above.

7. Price To Cover:

The bid price shall also cover all additional supervision, labor, material, equipment and insurance necessary to excavate while protecting and maintaining (excluding supports for fully exposed live gas) gas facilities without disruption of service to the public and in accordance with contract specifications. The price shall also include, changes of sheeting method and excavation width configuration where necessary to accommodate gas facilities in their existing locations; difficulties during the installation of catch basins,

chute connections, hydrant branch, and house sewer and water connections under or over gas facilities; loss of productivity due to slower rate of excavation (special care) during excavation, including the use of such methods as: hand excavation around existing single and multiple facilities, extra excavation and backfilling due to lost trench because of existing and adjacent gas facilities, compaction, removal of sheeting from the facilities, extra roadway base restoration and temporary pavement, associated maintenance and protection of traffic, barricades, and traffic plates that may be required to temporarily close and/or complete the work.

SECTION 6.07 - Test Pits For Gas Facilities.

1. Description:

Under this section, the Contractor shall furnish all labor, materials, insurance, equipment and appliances necessary to excavate, sheet and, maintain test pits at locations approved by the Resident Engineer in consultation with the facility operator. Test pits shall be dug in order to ascertain exact locations, cover and invert elevations, clearances, alignment and operating status (live or dead) of existing gas facilities. The Contractor shall inspect jointly with the Resident Engineer and facility operator, gas facilities and other structures uncovered, take all relevant measurements and elevations as directed by the Resident Engineer. Tests to determine operating status of gas facilities shall be performed by facility operator. The pits shall be covered with steel plates during daytime nonworking hours, and uncovered, as required, until the inspection work is completed. Testing of gas facilities may require a maximum of four (4) hours. Then, the pits shall be backfilled with clean fill, and resurfaced with temporary pavement. All traffic shall be maintained and all safety measures as stipulated shall be complied with.

2. Methods Of Construction:

- A. Excavation:** Existing pavement to be removed shall be neatly cut along lines of removal with a saw or other approved equipment which leaves a neat straight joint line along the juncture with subsequently replaced pavement. Excavation in the vicinity of utilities and other structures shall be performed using hand tools. Use of hand operated pneumatic and electric jackhammers will be permitted only for breaking pavement and removal of masonry, concrete and boulders, or as otherwise directed by the Resident Engineer. The Contractor shall properly dispose of all materials excavated from test pits away from site. Test pits shall be excavated at locations shown on the contract drawings or as directed by the Resident Engineer. Additional test pits may be required and shall be excavated where required, as ordered by the Resident Engineer. All test pits shall be excavated to a depth and size necessary to locate the existing facilities. ~~Sheeting shall be used when depth of excavation exceeds five (5) feet.~~ The sheeting required shall be furnished and installed in full compliance with the State of New York and Federal Safety Codes requirements and as specified in contract, whichever is more stringent. Care shall be taken that no existing gas facilities or other structures are broken or damaged. All broken or damaged facilities shall be reported immediately to facility operator who shall decide whether such facilities shall be repaired or replaced by company forces or by City contractor and in conformance with "General Provisions; Gas Cost Sharing Work Paragraph No. 9". Contractor shall excavate all material encountered, including large masses of concrete, cemented masonry and boulders, as directed by the Resident Engineer. Any type of excavation protection used, shall satisfy the following:

- (a) Industrial Code Rule 753.**
- (b) Prevent injury to workers and the public, and avoid damage to existing water, sewer, and gas pipes or other structures, and to pavements and their foundations, through caving or sliding of the banks of the excavation.**

Should it become necessary, as determined by the Resident Engineer, to enlarge any test pit in any dimension after sheeting has been placed, the Contractor shall remove portions of the sheeting, as necessary, enlarge the test pits as directed, and replace the sheeting without additional compensation for this work other than for the additional volume of material excavated.

- B. Maintenance Of Test Pits:** Excavated test pits shall be maintained free of debris and kept dry by the Contractor in order to permit the inspection and measurements and to determine the locations of facilities. In order to accomplish this, Contractor shall, upon completion of excavation and placement of sheeting (if depth greater than five (5) feet), furnish and install adequate steel plates and posting

over the excavated pits and shall temporarily remove all equipment debris and workers, and relocate barricades in order to open the full width of street to traffic during nonworking hours. The Contractor shall then, at no additional cost, relocate such barricades, barrels, cones and other warning devices and remove steel plates, as and when directed by the Resident Engineer to facilitate the inspection of exposed facilities. When work is being performed and the pits are not covered with steel plates, the Contractor shall provide complete and safe access to the test pits as may be required, and he shall provide construction barricades and maintain traffic at all times as shown or as directed by the Resident Engineer. Upon completion of test pit inspection by the Resident Engineer, the pit shall be backfilled by the Contractor as specified in contract, except that backfill material shall conform to contract specifications for such purpose.

- C. Pavement And Sidewalk Restoration: After backfilling is completed, the Contractor shall construct a temporary pavement consisting of a minimum of four (4) inches thick asphaltic concrete mixture in roadway areas or a two (2) inches thick asphaltic concrete mixture in sidewalk areas in order to maintain existing pedestrian and vehicular traffic. This temporary pavement shall be maintained until permanent pavement and sidewalk replacement is constructed as specified in contract.

3. Measurements:

The quantity to be measured for payment shall be the number of cubic yards of material removed from within the limits of the pit dimensions as directed by the Resident Engineer. The volume occupied by existing pipes or other structures remaining within the maximum payment lines will not be deducted from the total volume measured except, where the cross sectional area of these facilities exceeds four (4) square feet. As determined by the Resident Engineer, the quantity measured for payment may be proportionate to a fair and reasonable estimate of gas responsibility in the total volume excavated.

4. Price To Cover:

The contract price bid per cubic yard for test pits shall cover all additional costs of labor, material, insurance, equipment, appliances and incidentals required to excavate test pits, including removal and disposal of excavated materials, sheeting, steel plating, backfill, compaction and temporary pavement and sidewalk restoration all in accordance with the specifications and as directed by the Resident Engineer. The price shall also include the cost of providing safe access to the excavation by facility operator for the performance of certain test to determine operating status of gas facilities prior to City work. The price shall also include support and protection of all gas facilities crossing excavation, paralleling and/or encroaching any face of excavation.

GAS COST SHARING STANDARD SPECIFICATIONS
SCHEDULE GCS-A

Average rate charged by utility companies to Disconnect and Reconnect Gas Services:

1. National Grid - \$586.90 per Service/and Visit
2. Con Edison - \$524.00 per Service/and Visit

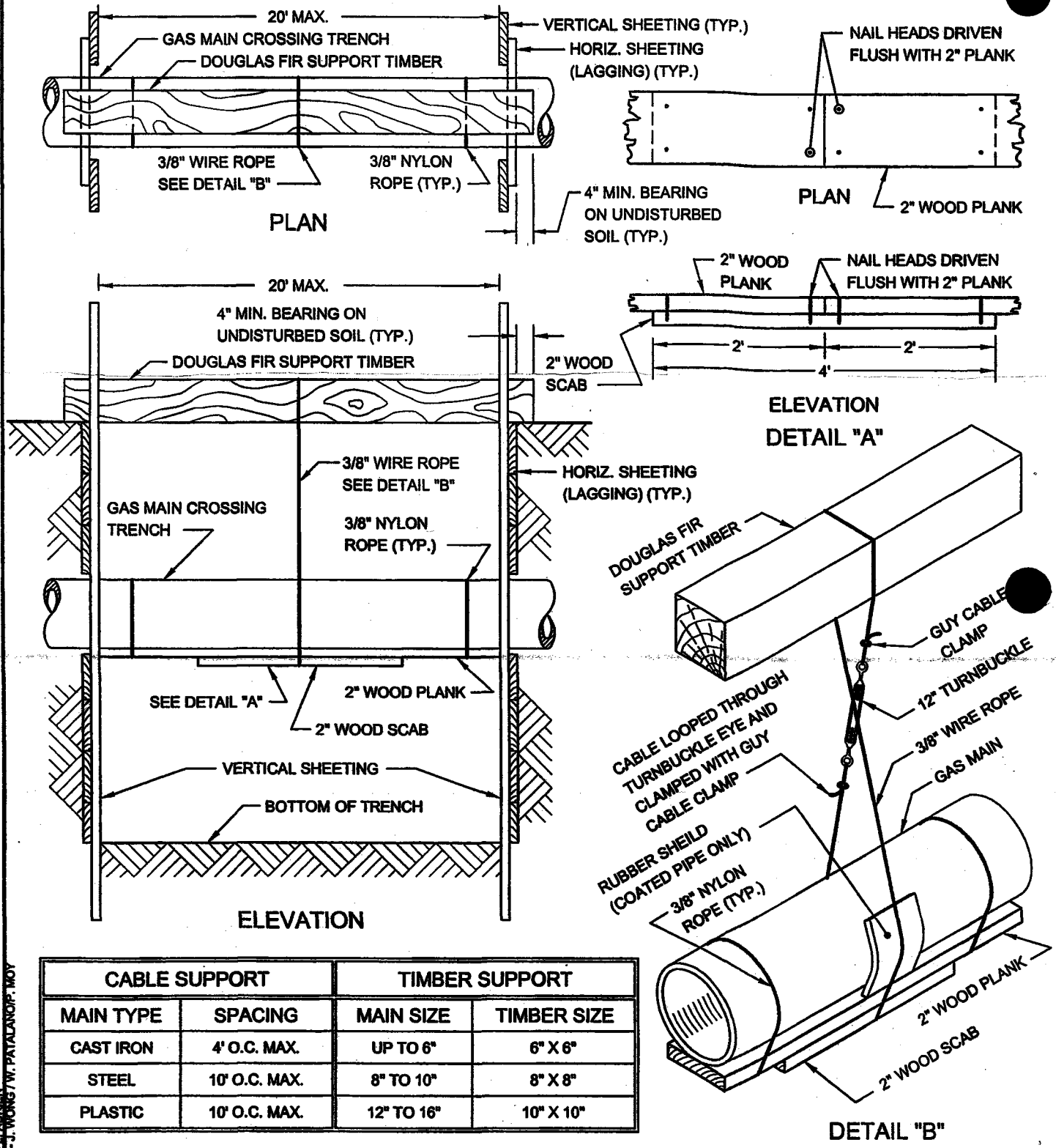
IV - STANDARD SKETCHES; GAS COST SHARING WORK

Hereinafter attached are the following Standard Sketches for Gas Cost Sharing Work:

- Sketch No. 1 - Support Requirements For Gas Mains And Services Crossing Excavation Greater Than 4' - 0" Wide At Any Angle
- Sketch No. 1A - Support Requirements For Gas Mains Over 16" Diameter Up To And Including 48" Diameter Crossing Excavation At Any Angle
- Sketch No. 2 - Typical Methods Of Measurement For Gas Crossings
- Sketch No. 3 - Utility Crossings During Catch Basin Chute Connection Pipe Installation
- Sketch No. 4 - Utility Crossings During Catch Basin Chute Connection Pipe Installation (Extra Depth)
- Sketch No. 5 - Gas Main Encroachment On And/Or Parallel To Excavation Of Unsheeted Trench

GAS COST SHARING WORK (SKETCH NO. 1)

SUPPORT REQUIREMENTS FOR GAS MAINS AND SERVICES CROSSING EXCAVATION GREATER THAN 4'-0" WIDE AT ANY ANGLE

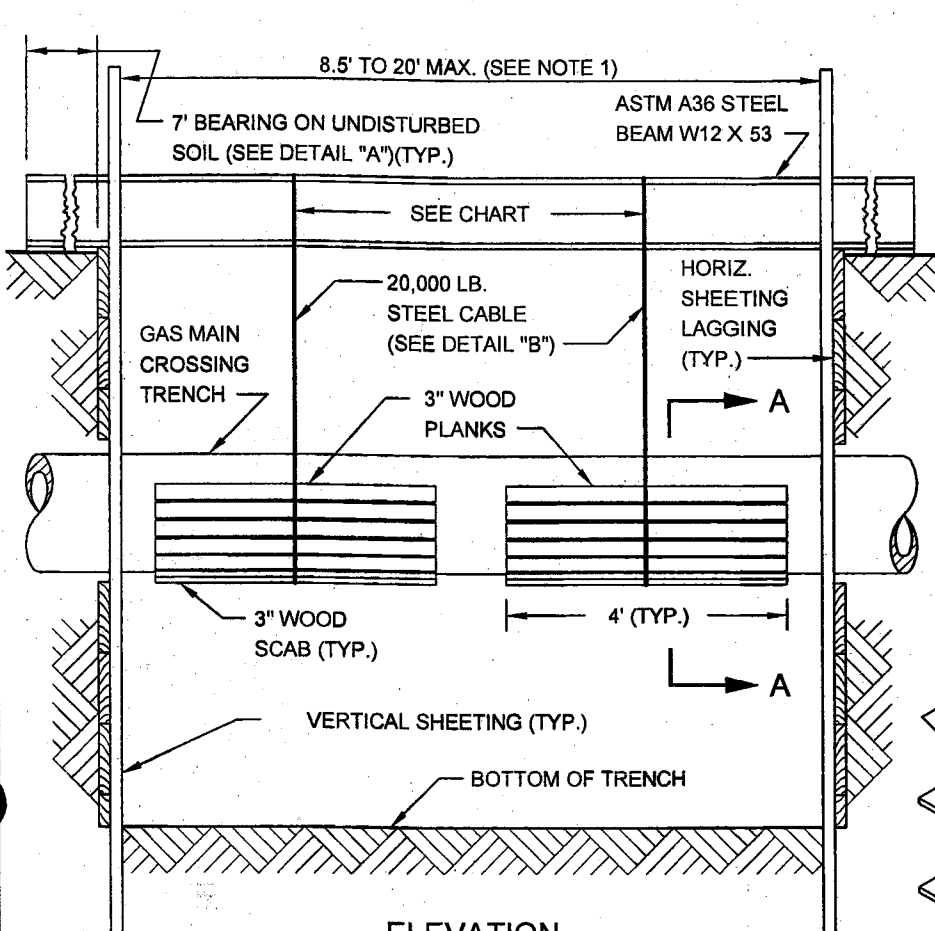


CABLE SUPPORT		TIMBER SUPPORT	
MAIN TYPE	SPACING	MAIN SIZE	TIMBER SIZE
CAST IRON	4' O.C. MAX.	UP TO 6"	6" X 6"
STEEL	10' O.C. MAX.	8" TO 10"	8" X 8"
PLASTIC	10' O.C. MAX.	12" TO 16"	10" X 10"

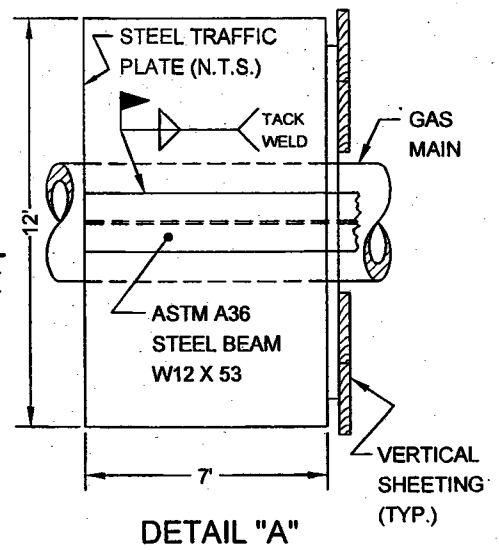
REVISED OCT. 2004 - L. ADRIEN
 REVISED JUNE 1986 - J. WONG / W. PATALANOP, MOY

GAS COST SHARING WORK (SKETCH NO. 1A)

SUPPORT REQUIREMENTS FOR GAS MAINS OVER 16" DIAMETER UP TO AND INCLUDING 48" DIAMETER CROSSING EXCAVATION AT ANY ANGLE

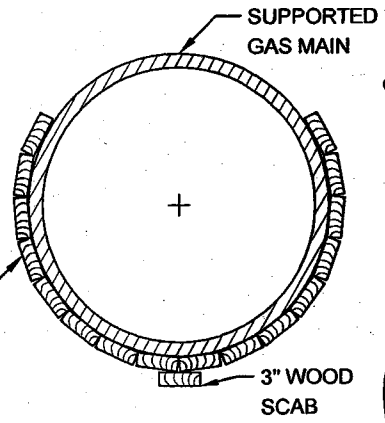


ELEVATION

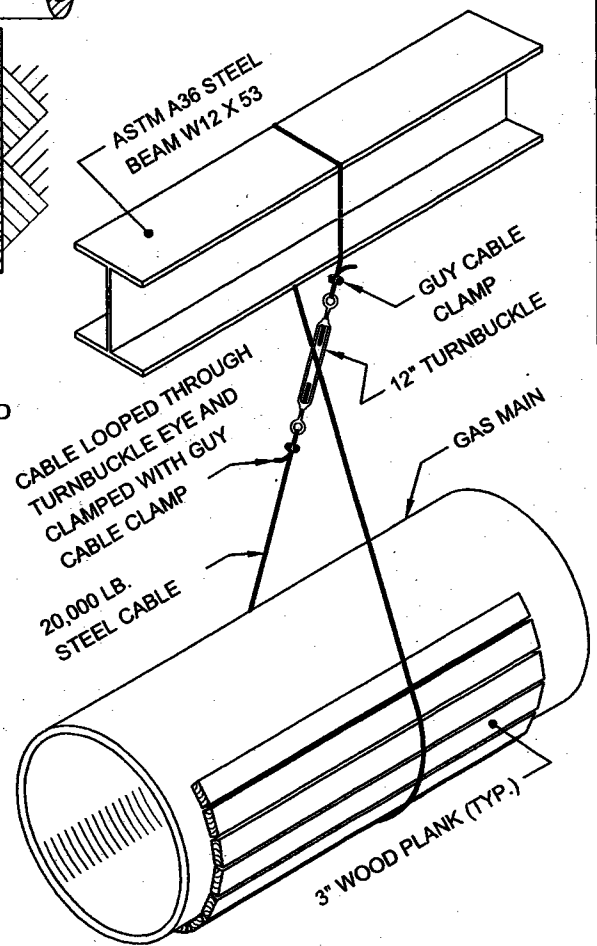


DETAIL "A"

CABLE SUPPORT	
MAIN TYPE	SPACING
CAST IRON	4' O.C. MAX.
STEEL	10' O.C. MAX.



SECTION A-A



DETAIL "B"

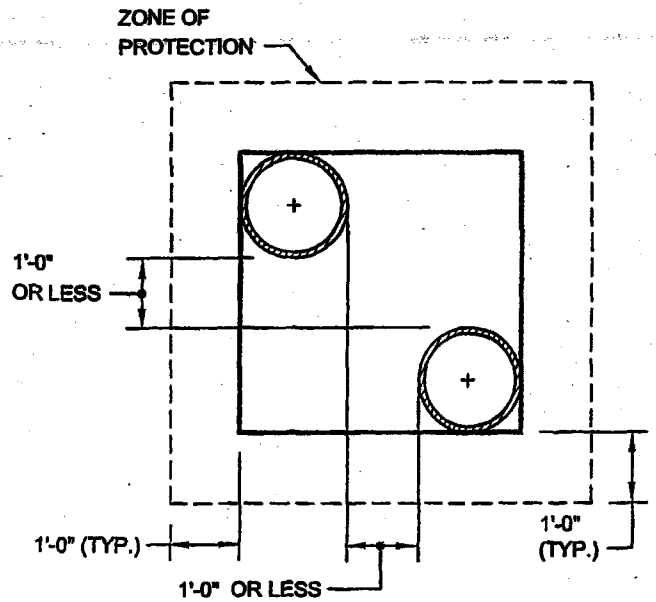
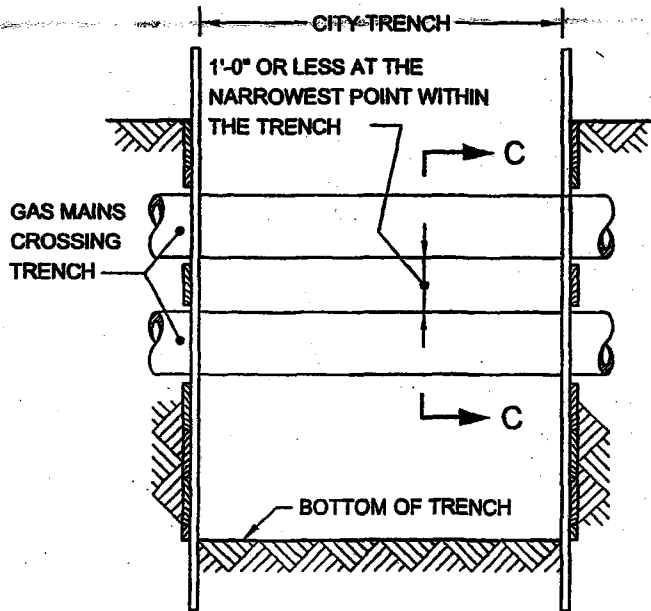
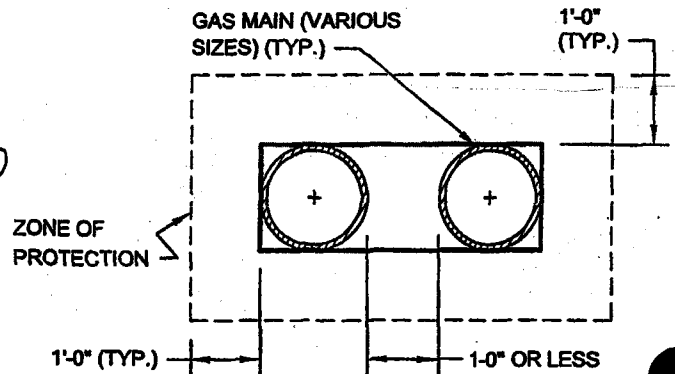
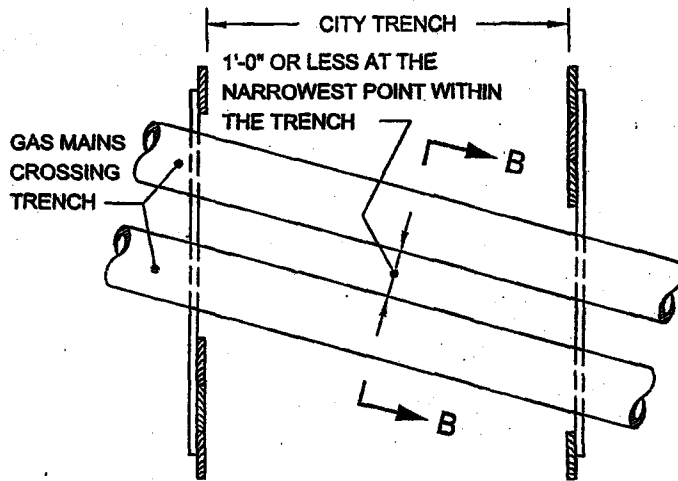
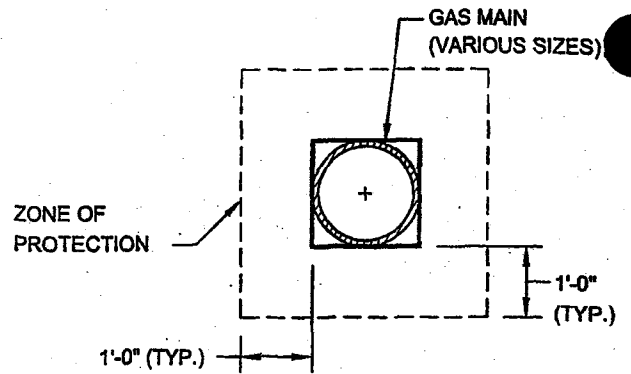
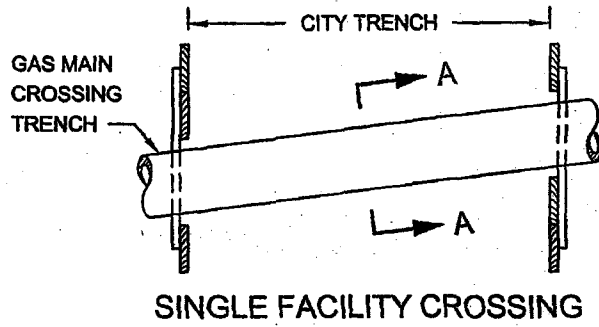
NOTES:

- (1) NO SUPPORT IS REQUIRED FOR GAS MAINS OVER 16" DIA. UP TO AND INCLUDING 48" DIA. CROSSING TRENCHES LESS THAN 8.5' WIDE.
- (2) UNDERMINE A MAXIMUM OF 8.5' L.F. OF CAST IRON GAS MAIN AT A TIME.
- (3) SET STEEL CABLE OVER 3" WOOD PROTECTIVE PLANKS AND PLACE AN ADDITIONAL 3" SCAB ON THE BOTTOM OF THE GAS MAIN.
- (4) ADJUST STEEL CABLE UNTIL DEAD WEIGHT OF THE UNDERMINED GAS MAIN HAS BEEN TAKEN UP BY THE OVERHEAD STEEL BEAM SUPPORT.
- (5) ALL SUPPORTS AND STEEL CABLES CAN BE REMOVED ONLY AFTER THE REQUIRED BACKFILL (AROUND AND BELOW GAS MAIN) HAS BEEN COMPACTED IN ACCORDANCE WITH NEW YORK CITY STANDARDS AND AT THE DIRECTIONS OF THE ENGINEER.

REVISIONS: 04-11-ADRIEN
 REVISED JUNE-1998 - J. WONG / W. PATALANORP. MOY

GAS COST SHARING WORK (SKETCH NO. 2)

TYPICAL METHODS OF MEASUREMENT FOR GAS CROSSINGS



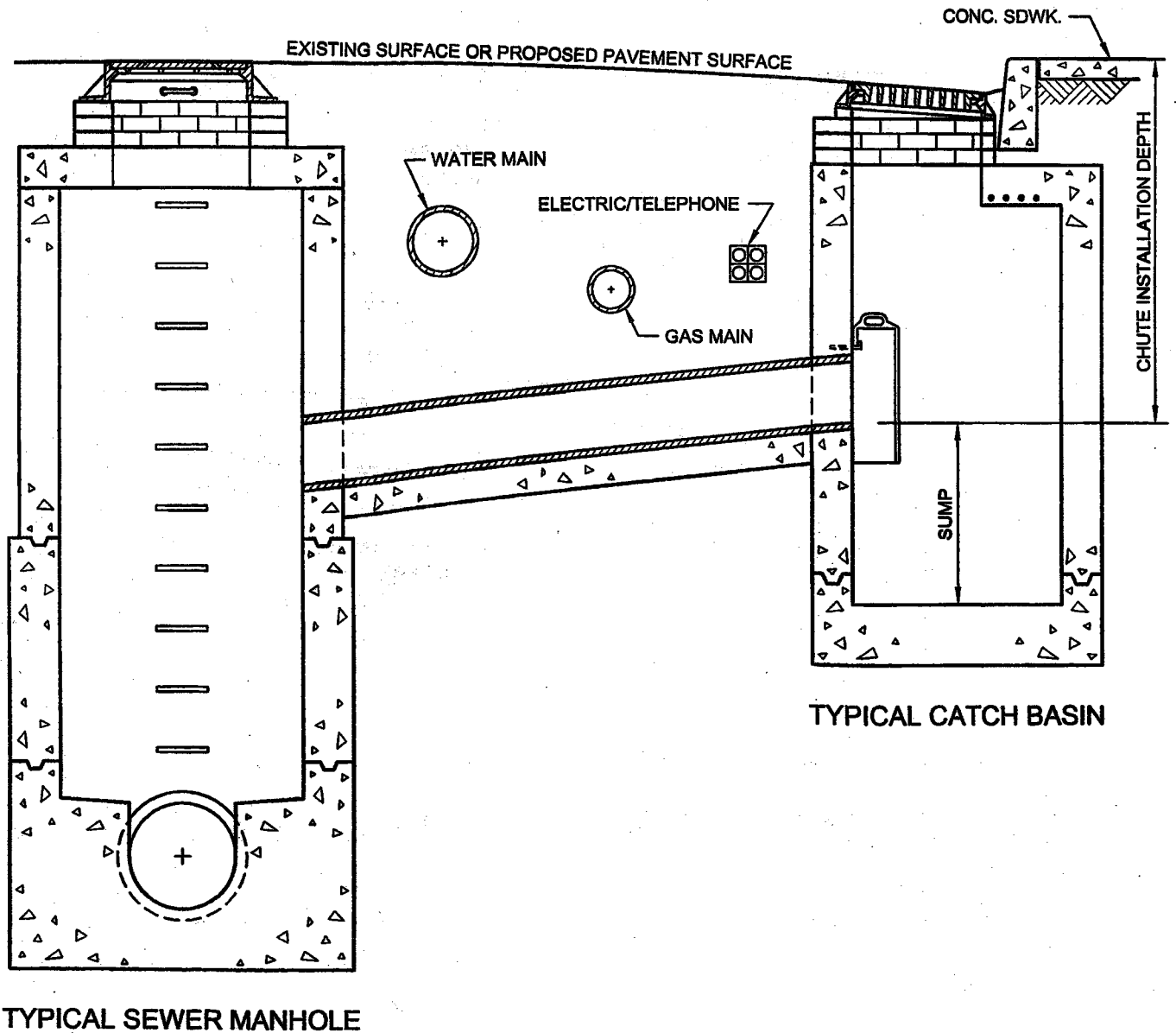
NOTE:

GAS MAINS MAY OR MAY NOT BE PARALLEL TO EACH OTHER.

REVISED SEPT. 2004 - L. ADRIEN
 REVISED SEPT. 2004 - J. WONG/W. PATALANOF. MOY

GAS COST SHARING WORK (SKETCH NO. 3)

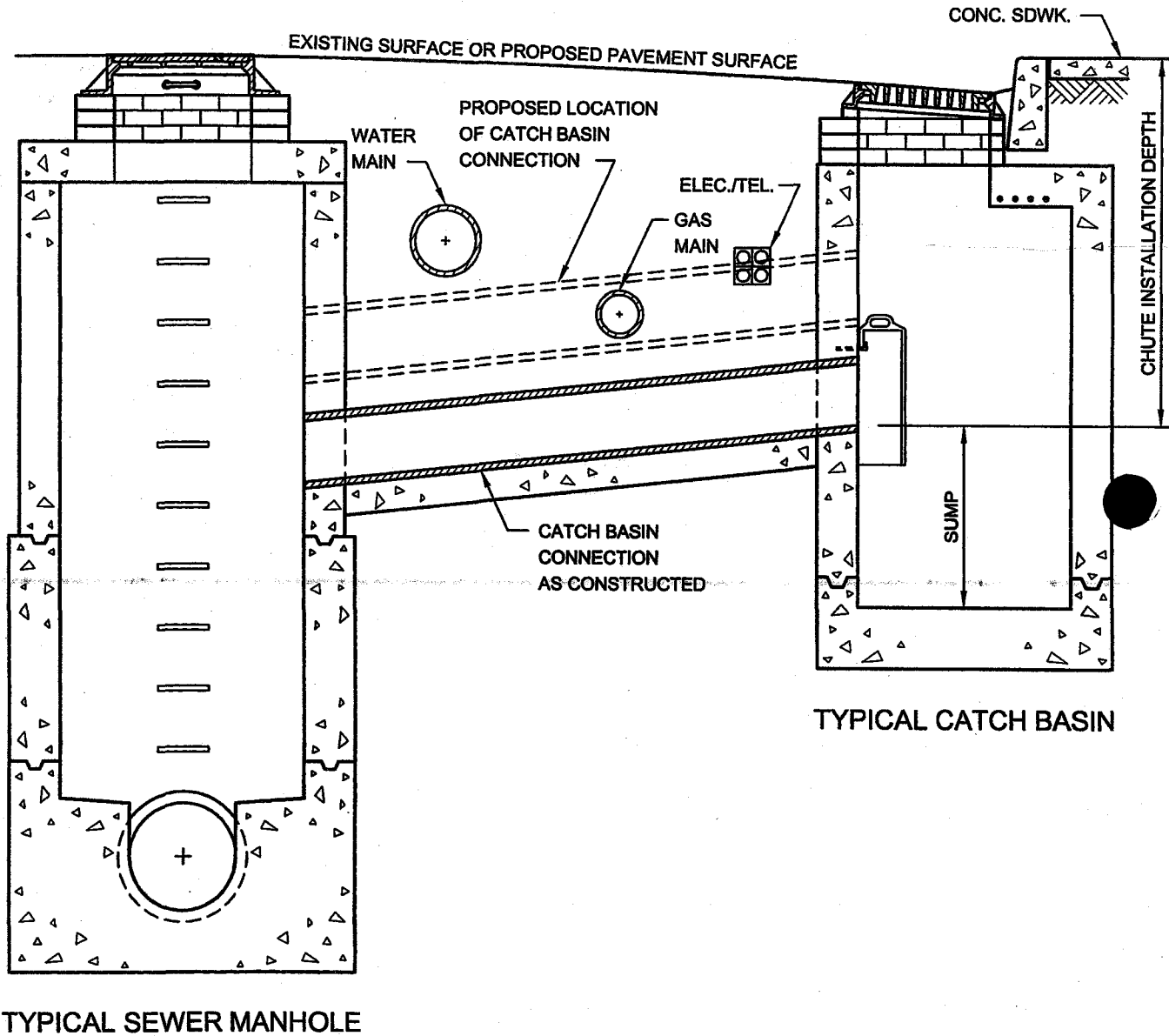
UTILITY CROSSINGS DURING CATCH BASIN CHUTE CONNECTION PIPE INSTALLATION



REVISED OCT. 2004 - L. ADRIEN
REVISED OCT. 1988 - J. WONG/W. PATALANDIP. MOY

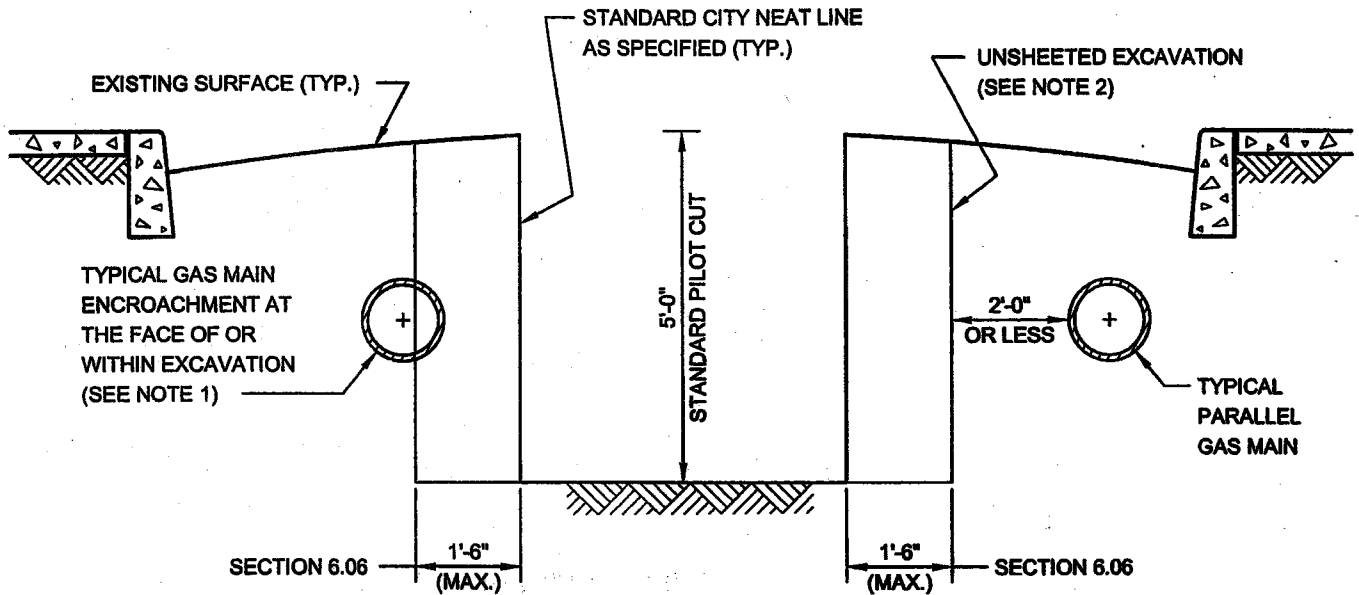
GAS COST SHARING WORK (SKETCH NO. 4)

UTILITY CROSSINGS DURING CATCH BASIN CHUTE CONNECTION PIPE INSTALLATION (EXTRA DEPTH)



REVISED OCT. 2004 - L. ADRIEN
 REVISED OCT. 1998 - J. WONGW. PATALANOP. MOY

GAS COST SHARING WORK (SKETCH NO. 5)
GAS MAIN ENCROACHMENT ON AND/OR PARALLEL
TO EXCAVATION OF UNSHEETED TRENCH



NOTES:

- (1) GAS MAIN LOCATED AS SHOWN MAY HAVE TO BE REMOVED BY THE FACILITY OPERATOR PRIOR TO THE START OF CITY EXCAVATION, OTHERWISE, THE CONTRACTOR WILL BE PAID UNDER SECTION 6.06 FOR THE SAID WORK. IF GAS MAIN IS ABANDONED THEN SECTION 6.03 SHALL APPLY.
- (2) EIGHTEEN (18) INCHES FROM STANDARD NEAT LINE IS THE MAXIMUM ALLOWABLE WIDTH OF AREA THAT MAY BE DISTURBED OR EXCAVATED DURING INSTALLATION OF CERTAIN TYPES OF SHEETING SYSTEMS THAT MEET THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS OF THE DEPARTMENT OF DESIGN AND CONSTRUCTION OF THE CITY OF NEW YORK.

REVISED OCT. 2004 - J. ADRIEN
 REVISED OCT. 1999 - J. WONG W. PATALANOP, MOY

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A3-21G

V - PRELIMINARY GAS WORK TO BE PERFORMED BY
FACILITY OPERATOR

APPLICABLE TO ALL GAS DRAWINGS:

- ALL RELOCATION WORK SHOWN IN THIS ADDENDUM IS TO BE PERFORMED BY FACILITY OPERATOR.
- ALL SUPPORT AND PROTECTION WORK TO BE PERFORMED BY CITY CONTRACTOR
- IF ADDITIONAL INFORMATION IS NEEDED REGARDING THE FACILITY OPERATOR RELOCATION WORK, THE CONTRACTOR IS ADVISED TO CONTACT THE GAS COMPANY REPRESENTATIVE:

MR. GERARD LUNDQUIST
NATIONAL GRID
287 MASPETH AVENUE
BROOKLYN, NY 11211
TEL.: 718-963-5506

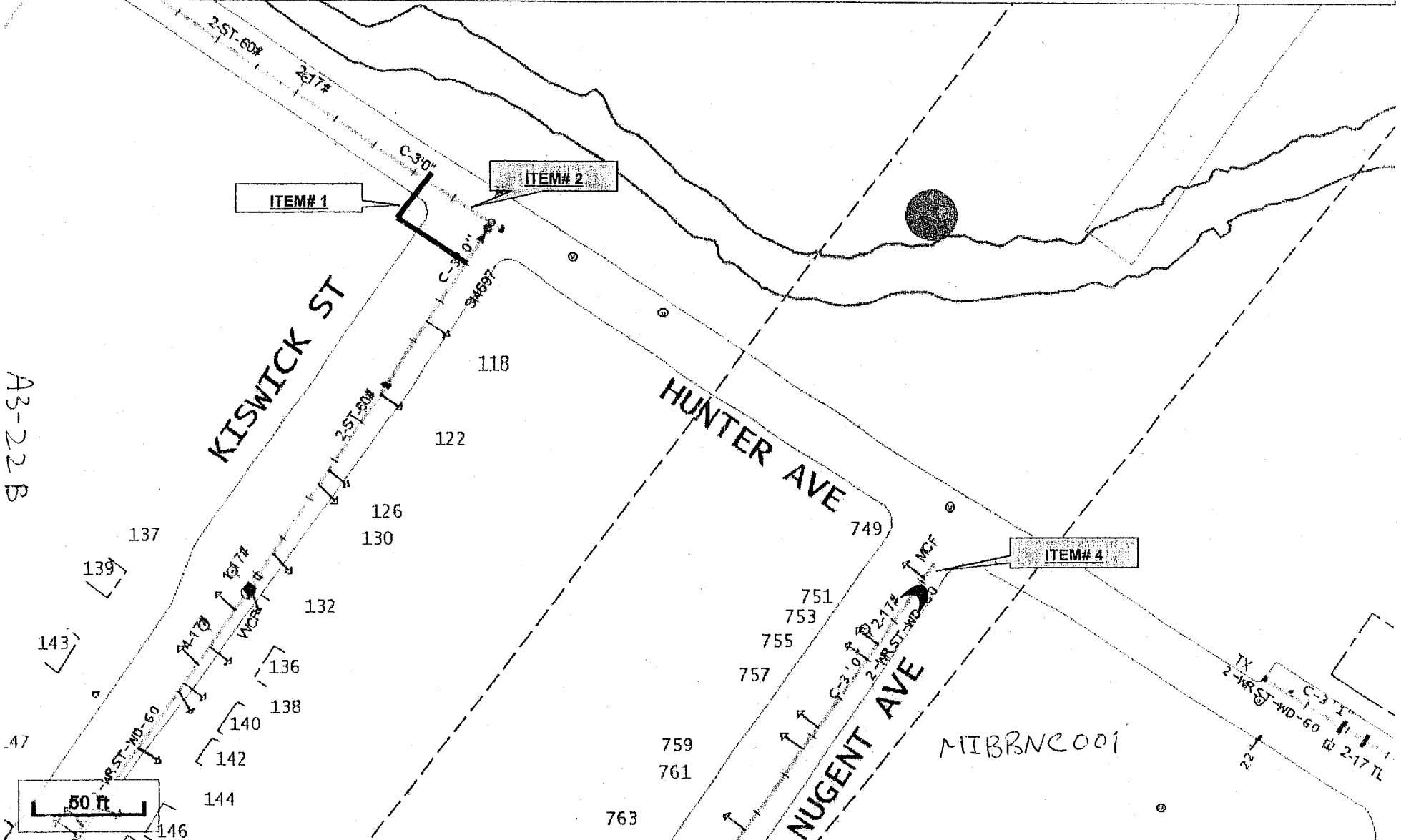
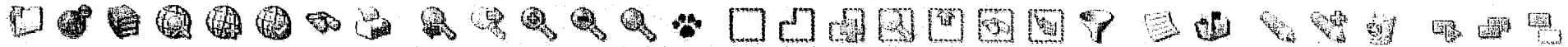
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MIBBNC001 GAS MAIN INSTALLATION

ITEM#	ON STREET	1ST X-STREET	2ND X-STREET	SIZE/MAT'L	FOOTAGE	PRESSURE	REMB
1	HUNTER AVE	KISWICK ST	INTERSECTION	2" PL	80'	HP-60#	Y
3	FREEBORN ST	GRAHAM BLVD	JEFFERSON AVE	2" PL	185'	HP-60#	Y
5	FREEBORN ST	JEFFERSON AVE	HUNTER AVE	2" PL	120'	HP-60#	N

MIBBNC001 GAS MAIN RETIREMENT

ITEM#	ON STREET	1ST X-STREET	2ND X-STREET	SIZE/MAT'L	FOOTAGE	PRESSURE	REMB
2	HUNTER AVE	KISWICK ST	INTERSECTION	2"WS	90'	HP-60#	Y
4	NUGENT AVE	HUNTER AVE	INTERSECTION	2"WS	40'	HP-60#	Y
6	JEFFERSON AVE	NUGENT AVE	INTERSECTION	2"WS	10'	HP-60#	Y
8	FREEBORN ST	GRAHAM BLVD	JEFFERSON AVE	2"WS	185'	HP-60#	Y
10	FREEBORN ST	JEFFERSON AVE	HUNTER AVE	2" WS	120'	HP-60#	N

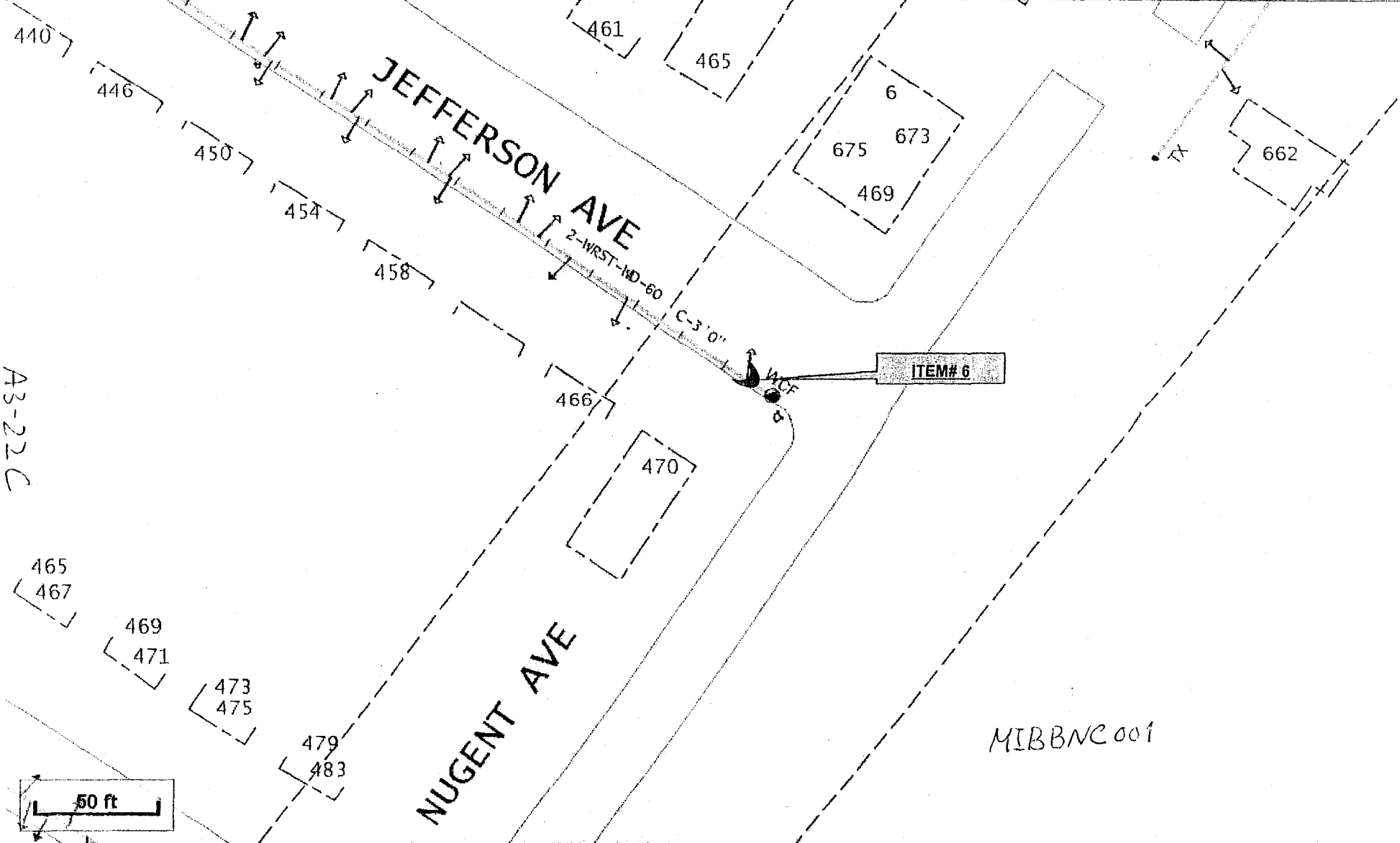


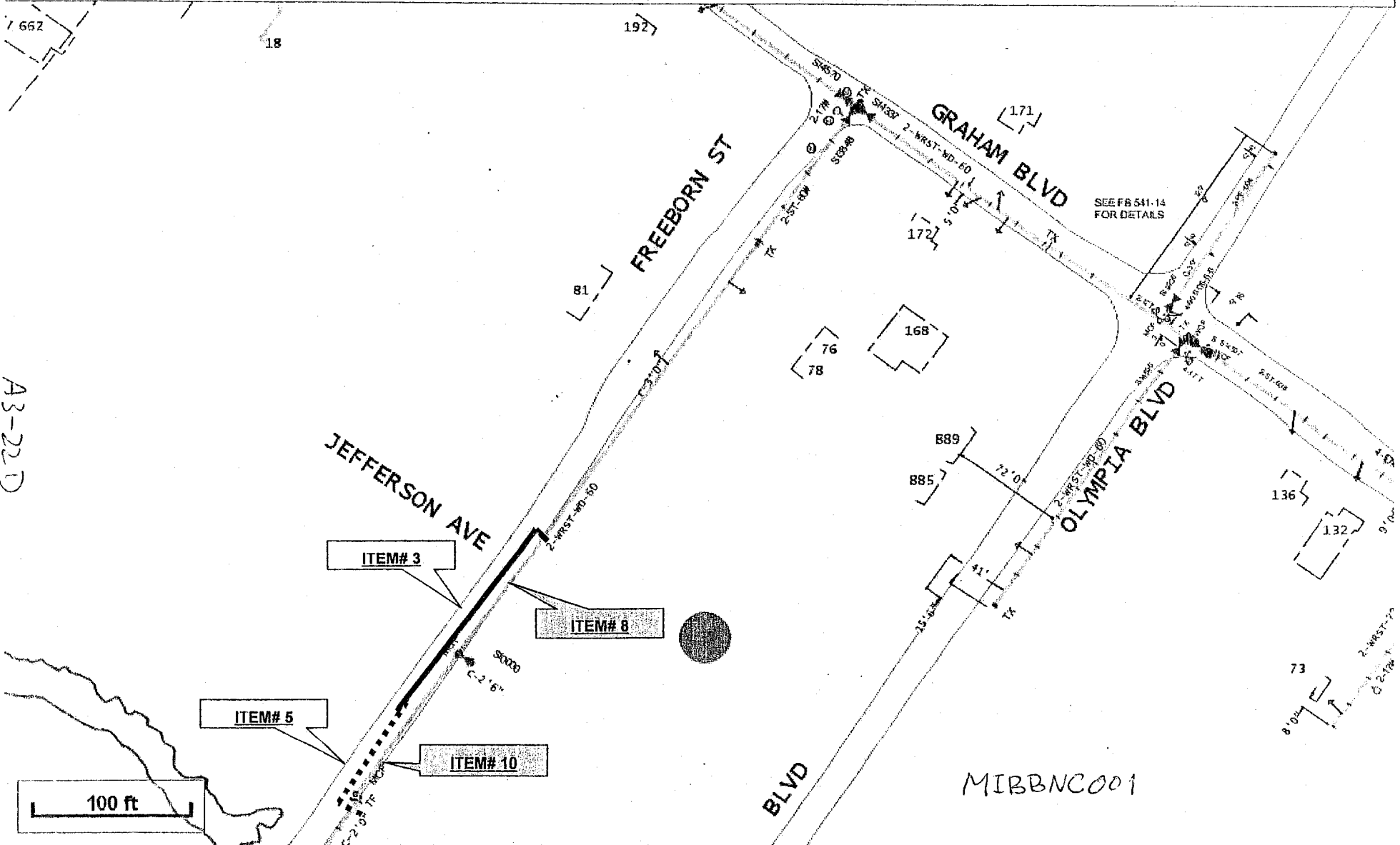
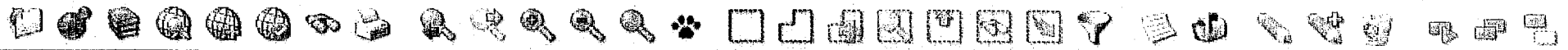
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y: 635214

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VI - LISTING OF APPROXIMATE LOCATIONS OF EP-7 BID
ITEMS QUANTITIES

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**SCOPE OF WORK
SUPPORT AND PROTECTION
FOR CONTRACT NUMBER MIBBNC001**

The City of New York Department of Design and Construction is planning to install sewers and/or water mains and all appurtenances in various locations in The City of New York along with all work incidental thereto.

6.01.1 - Support & Protect Gas Main Crossing Sewer Up To 24" In Diameter (Ea.)

1 in Hunter Avenue @ Kiswick Street

6.01.6L - Support & Protect Gas Main Crossing Sewer 6'-0"W x 3'-0"H Double Barrel F.T.R.C. (Ea.)

1 in Freeborn Street @ Jefferson Avenue

6.01.7DD- Support & Protect Gas Main Crossing Sewer 10'-0"W x 5'-0"H F.T.R.C. (Ea.)

1 in Graham Blvd. Bet. Baden Pl. & Patterson Avenue

6.02 - Extra Excavation For The Installation Of Catch Basin Sewer Drain Pipes With Gas Interferences (Ea.)

2 in Freeborn Street Bet. Graham Blvd. & Jefferson Avenue

6.03 - Removal Of Abandoned Gas Facilities. All Sizes (L.F.)

200 in Various Locations As Required

6.03.1 - Removal Of Abandoned Gas Facilities With Possible Coal Tar Wrap. All Sizes. (For National Grid Work Only) (L.F.)

100 in Various Locations As Required

6.04 - Adjust Hardware To Grade Using Spacer Rings / Adaptor (Street Repaving) (Ea.)

5 in Various Locations As Required

6.05 - Adjust Hardware To Grade By Resetting (Road Reconstruction) (Ea.)

2 in Various Locations As Required

6.06 - Special Care Excavation & Backfilling (C.Y.)

100 CY In Various Locations As Required, Including But Not Limited To All Gas Services Crossing Unsheeted Water Main Trenches.

SCOPE OF WORK
SUPPORT AND PROTECTION
FOR CONTRACT NUMBER MIBBNC001

The City of New York Department of Design and Construction is planning to install sewers and/or water mains and all appurtenances in various locations in The City of New York along with all work incidental thereto.

6.07 - Test Pits For Gas Facilities (C.Y.)

20 in Various Locations As Required.

END OF ADDENDUM NO 3

This Addendum consists of thirty-six (36) pages

THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
INFRASTRUCTURE DIVISION
BUREAU OF DESIGN

PROJECT ID: MIBBNC001

FOR THE CONSTRUCTION OF STORM SEWERS IN: KISWICK STREET BETWEEN HUNTER AVENUE AND BMP NC-7; NUGENT AVENUE BETWEEN HUNTER AVENUE AND BMP NC-7; JEFFERSON AVENUE BETWEEN NUGENT AVENUE AND BMP NC-7; GRIMSBY STREET BETWEEN A POINT APPROXIMATELY 150 FEET EAST OF GRAHAM BOULEVARD AND BMP NC-7; FREEBORN STREET BETWEEN BMP NC-7 AND BMP NC-8; OLYMPIA BOULEVARD BETWEEN BMP NC-8 AND BMP NC-9; GRAHAM BOULEVARD BETWEEN BMP NC-9 AND BMP NC-17; SANITARY SEWERS IN HUNTER AVENUE BETWEEN KISWICK STREET AND NUGENT AVENUE, GRAHAM BOULEVARD BETWEEN PATTERSON AVENUE AND BADEN PLACE

INCLUDING WATER MAIN WORK
ON KISWICK STREET BETWEEN BEDFORD AVENUE AND HUNTER AVENUE, HUNTER AVENUE BETWEEN KISWICK STREET AND NUGENT AVENUE, NUGENT AVENUE BETWEEN BEDFORD AVENUE AND HUNTER AVENUE, FREEBORN STREET BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD, OLYMPIA BOULEVARD BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD, GRAHAM BOULEVARD BETWEEN BADEN PLACE AND PATTERSON AVENUE

TOGETHER WITH ALL WORK INCIDENTAL THERETO

BOROUGH OF STATEN ISLAND
CITY OF NEW YORK

ADDENDUM NO.4

DATED: February 26, 2014

THIS ADDENDUM IS HEREBY MADE A PART OF THE CONTRACT DOCUMENTS

1. The Contractor shall be responsible for compliance with all the provisions of the following Sections and Schedules, which are hereby made a part of the original contract documents:
 - A. "SECTION U: Additional Contract Requirements Applying to Work Performed in the Presence of Privately Owned Utility Facilities" (Pages A4-4 through A4-14)
 - B. Schedule U-1 (Page A4-15)
 - C. Schedules U-2 (one for each Utility Company) (Pages A4-16 through A4-21)
 - D. Section U-3 Page A4-22 in this Addendum (as per the Private Utilities reference document for SECTION U called "CET SPECIFICATIONS AND SKETCHES", dated November 2010)
 - E. Utility Drawings consisting of (8) drawings:
 - Con Edison Electrical Condition Report (3)
 - Con Edison Conduit & Duct Occupancy Plate (2)
 - Con Edison Low Tension Mains & Service Plate (2)
 - Verizon Existing Facilities Plan (1)

2. Each facility operator shall provide inspectors at the work site to inspect methods of interference work, verify quantities and items of Utility Work, and coordinate all phases of the facility operator operations.
3. In addition, the following statements are made to provide clarification of various paragraphs under Section U:
 - A. Section U, ¶4, requires the Contractor to immediately commence negotiations with each Company for an Interference Agreement under which the Company will compensate the Contractor for any Interference Work which the Company does not elect to perform with its own forces or by specialty contractors retained by the Company. Thus the Contractor is on notice that its work under the Contract may be affected by Interference Work performed by (a) the Contractor pursuant to a separate Interference Agreement with the Company, (b) the Company, or (c) partly by each.
 - B. Section U, ¶2, informs the Contractor that the duration of the Contract as shown in Schedule A includes the time which may be necessary for the Contractor to perform the necessary Interference Work.
 - C. The Contractor is hereby informed that the duration of the Contract as shown in Schedule A includes the time which may be necessary for the Company to perform whatever portion of the Interference Work which the Company elects to perform with its own forces or by specialty contractors retained by the Company.
 - D. Section U informs the Contractor that the City has entered into a Utility Agreement with the Companies regarding interferences to the City work in this Contract created by the facilities owned and/or operated by such Companies. Pursuant to this Addendum, a sample of the Utility Agreement letter as executed by the Companies is annexed on page A4-14, as an Exhibit to the Contract. Signed copies of those Utility Agreement letters are on file with NYCDDC.
 - E. The City has no contract with any of the Companies for work on or adjacent to the site of work under this Contract, and the Companies are not "Other Contractors" as defined for the purposes of this Contract. The Contractor is reminded, however, that pursuant to Section U, ¶4, the City will not compensate the Contractor for any direct and/or indirect costs related to Interference Work, regardless of whether such Interference Work is covered by an Interference Agreement between the Contractor and the Company or is performed by the Company using its own forces or by specialty contractors retained by the Company.
 - F. Section U, ¶14, provides that the provisions of Section U are material provisions of the Contract and that the Contractor's failure to comply with the procedures set forth in Section U

are sufficient for the Commissioner to declare the Contractor in default pursuant to Article 48 of the Contract. Pursuant to this Addendum, the Contractor is informed that the Performance Bond required of the Contractor pursuant to the Contract is not deemed to guarantee performance of any of the Interference Work.

Section U: Additional Contract Requirements Applicable to Work Performed in the Presence of Privately Owned Utility Facilities

The Contractor is hereby notified that pursuant to the law and franchise agreements issued by the City, certain private utility and public service companies named in Schedule U-1 ("the Companies") own and/or operate surface and/or subsurface facilities within the limits of this contract. The existence of these facilities impacts the productivity of the City work called for in the contract. In order to improve coordination of the City construction with the private utility facilities owned and/or operated by the Companies named in Schedule U-1, Article 1.06.30 of the Standard Highway Specifications of the New York City Department of Transportation, Dated November 1, 2010; Articles 1.06.14 through 1.06.17 of the General Provisions of the Standard Water Main Specifications of the New York City Department of Environmental Protection, dated August 1, 2009; and/or Articles 1.06.14 through 1.06.17 of the Standard Sewer Specifications of the New York City Department of Environmental Protection, Dated August 1, 2009; as applicable, are amended and will be implemented as follows:

1. Pre-engineering:

The anticipated scopes of private utility facilities interferences and anticipated work items and specifications are included in this contract. The locations of these interferences are indicated on the plans and/or listed in the specifications for this contract, and a schedule of estimated quantities by type of interference expected to be encountered within the limits of this project area have been listed on Schedule U-2. In addition, in Section U-3 the Companies have provided standard details and methods for supporting, protecting, relocating, and/or working around their facilities when they are in interference with City contract work.

2. Means and methods for City work:

- a) The Contractor is hereby notified that the utility interferences identified on the plans and/or listed in the Specifications to be known conditions which may impact the performance of, and/or interferes with, City work. The contractor will be required to perform such utility work as directed by the Resident Engineer in order to clear all utility interferences from the project site as required for satisfactory completion of City work within specified contract schedule.
- b) In areas serviced by overhead electric system, the contractor understands and by bidding for this contract agrees that he/she has reviewed the section 'U' package and

that he/she will be required to perform the public work in the presence of energized electrical overhead lines and appurtenances located in areas adjacent and/or within the project area. As a consequence he/she will select means and method of construction appropriate to maintain the safety clearances required or as permitted by contract specifications (e.g. "CET 350 - Overhead Accommodation Protection of Overhead Facilities, Poles, and Appurtenances") in order to avoid damaging the insulation or shielding of these lines and also to prevent knocking them down. The duration of the contract as shown in Schedule A thus includes the time which may be necessary for the Contractor to remove, repair, protect, support, shift, relocate, temporarily remove and replace, work around and/or work in the presence of the Companies' facilities ("Interference Work") as described on the plans and/or specifications of the contract during the progress of the City work.

3. *Field inspection prior to construction:*

Prior to the start of any contract work in areas serviced by overhead electric lines, and after the award to the apparent low bidder for this contract, the contractor must request a field walk of the project area along with the operator of the overhead electrical facilities and the DDC Engineer-In-Charge. At that time the facility operator, pursuant to contract specification (e.g. "CET 350 - Overhead Accommodation Protection of Overhead Facilities, Poles, and Appurtenances") will confirm the type and condition of the overhead electrical lines and the sufficiency of their insulating properties with respect to the means and methods proposed by the contractor. The contractor must be prepared to describe in enough details his/her proposed means and methods of construction operations in order to anticipate the likelihood that electric lines insulation would be cut or otherwise compromised. Also such details will allow the facility operator to anticipate the need for added insulation and/or shielding of non-insulated lines.

4. *Compensation for interference work:*

Compensation for Interference Work is a matter of adjustment between the Contractor and each private utility company located within the limits of the project area and whose utility facilities are affected by City contract work. In particular, the City will not compensate the Contractor for any direct and/or indirect costs related to Interference Work, including, but not limited to, lost profit, increased overhead, or any other impact costs. Upon receipt of a Notice of Award from the City, the Contractor shall immediately commence negotiations with each of the Companies concerning the manner in which and the price for which the Contractor,

through its own forces or by others hired by it, will perform and be paid by the Company for all necessary Interference Work as defined above that the Company(ies) choose(s) not to perform with its(their) own forces or by specialty Contractors hired by it (them) (as per "Interference Agreement"). (Specialty contractors' work is limited to (i) insulation installation and removal, (ii) live gas and steam work, (iii) cleanup and disposal of hazardous materials, (iv) splicing live electrical and telecommunications facilities, and (v) work not traditionally performed by general construction contractors.)

5. *Interference Agreement:*

1. The Companies have provided estimate of the quantity of each of the types of interferences expected to be encountered in the contract in Schedule U-2. Although the parties may negotiate an Interference Agreement in any format or manner they deem fit, the Contractor is hereby advised that the Companies have indicated to the City that they will agree to compensate the Contractor on a unit price basis according to the Quantity and Types of Interferences expected to be encountered on this Contract as stated in Schedule U-2.
2. Furthermore, in Section U-3, standard unit work measurement and payment provisions are specified and shall apply only if the Contractor and affected Utility companies enters into a unit price based Interference Agreement, otherwise the unit of work measurement, and payment provisions set forth in Section U-3 shall not apply. The Contractor shall notify the City upon concluding an Interference Agreement with each of the Companies, which shall be binding and final once concluded.

6. *City contract work to continue without Interference Agreement :*

If, prior to the start of construction, as directed by the City's Order to work / Notice To Proceed (OTW/ NTP) date any of the Companies and the Contractor have not concluded an Interference Agreement as described above, then the City construction will proceed as ordered and the Contractor will be directed by the Resident Engineer to perform the City work on Time, Material and Equipment basis (T&M) as specified in standard City contract agreement Article 26.2. T&M records will include identification of types of utility facilities interfering with City work, utility facility owners, specifying the nature and quantity of any materials, plant and equipment furnished or used in connection with the performance of such work and crew size, such as: name and number of each worker employed on such work. T&M records will also indicate the hours of active time, standby time and idle time. The Company (ies) and the Contractor will maintain separate records of the actual quantity and cost of labor, materials,

and equipment expended, and will provide copies of this information to the other party on a daily basis for reconciliation. These T&M records along with cost evaluations will be submitted daily to the Resident Engineer for review and approval. The total cost of City work will be based on quantity of work performed multiplied by unit price contract bid items. The total interference cost will be calculated as the difference between the total T&M cost and total cost for City work. The Resident Engineer will conduct a monthly reconciliation session of the daily T&M records with the affected Company (ies) and contractor. If the contractor and affected utility companies cannot reconcile their T&M records, by the last day of each month, then the Resident Engineer will submit the approved City's T&M records along with total cost evaluations to the DDC Director of Construction who will review these records and recommend approval and validity certification by the DDC Deputy Commissioner.

1. Copies of the DDC approved and certified T&M records will then be transmitted by the DDC to the contractor and the utility companies. These certified records may be used by the contractor for compensation claims against the responsible private facility owners, or may be used by any party as supporting documentation in dispute regarding compensation for performing Interference Work as identified in Schedule U-2. The contractor will be required to perform City work while invoices are submitted by the contractor to the Utility companies for payment within 30 days, or while compensation disputes between contractor and affected company (ies) are submitted to Binding Arbitration process described in Paragraph 10.
2. All issues related to utility work and/ or delays due to compensation disputes or claims against utility companies are not allowable as justification for granting contract time extensions. The City may assess liquidated damages specified in the contract for net overall delays suffered by City contract work as a result of utility issues, disputes and claims.
3. The standard City contract dispute resolution process specified in Article 27 "Presentation of disputes to Commissioner", of the standard City contract agreement is not applicable to any disputes related to utility work and/ or compensation for such work or claim against utility companies. Utility work issues, disputes and claims may only be submitted to Binding Arbitration process described in Paragraph 10.
4. The contractor will notify the Resident Engineer when utility capital work not specified in Schedule U2 and/ or for utility work that require the intervention of company utility specialty crews causes excessive contractor's labor and equipment standby or idleness

and, thereby jeopardizing the City project schedule. The Resident Engineer will submit the facts to the DDC Director of construction who will recommend to the Deputy Commissioner regarding the issuance of a "48 hours notice" to the concerned utility company as authorized by the New York City administrative Code Section 19-143 and/or Section 24-521 as applicable.

5. Utility delays caused by utility capital work not listed in Schedule U2 and/ or by unavailability of utility specialty crews cannot be discounted for earning any contractual bonus when such bonus clause is included in a contract. However, if such specified bonus is not earned or disallowed by the City or if the City assesses specified liquidated damages as a result of such excessive delays, the contractor may seek damages from the responsible utility company (ies).

7. *Extra utility work with Utility Agreement:*

If during construction the Contractor encounters utility facilities interferences or utility scope of work that it believes is not covered by the Interference Agreement as described above, then the Contractor shall immediately notify the Company in writing, with a copy to the City, describing the nature and location of the extra work in question. The Company then has five (5) business days to investigate the conditions and then:

1. Advise the Contractor and the City in writing that no interference with its facilities exists at the location in question, and hence that the Contractor may proceed with City work without providing for any impact from Company facilities;
2. Advise the Contractor and the City in writing that the Interference Agreement negotiated pursuant to Paragraph (6), above, provides for the scope of work encountered, specifying the exact unit items and/or terms of the agreement that cover the work;
3. Advise the Contractor and the City in writing that it intends to perform the necessary utility Work with company forces or with its own contractor including, but not limited to, relocating its facility out of the way of the proposed City work. In this case, the Company shall provide a written schedule for the performance of the utility work it proposes to perform, which shall be subject to approval by the City based on its impact to the Contractor's currently approved progress schedule. Upon approval of the Company's schedule by the City, the Contractor shall provide access to the worksite to the Company and/or any contractors hired by it to perform this utility work. If necessary, the City may

grant a contract time extension for delays caused by the performance of such utility work by the company.

4. Reasonably specify in writing the scope of work to be performed by the Contractor on behalf of the Company that is not covered under the Interference Agreement negotiated pursuant to Paragraph (6), including, but not limited to, relocating, supporting, and/or protecting the Company's facilities, and/or shifting the City facility if approved by the Resident Engineer, and/or otherwise changing its operations to work in the presence of the Company's facilities. Should the Company elect this option, it must adequately define and provide an initial price offer for the work required to be performed.

8. *Means and Methods for utility work:*

Upon receipt of the Company's determination pursuant to paragraphs 7.2, or 7.4, above, the Contractor shall determine reasonable means and methods of performing the work defined by the Company. These means and methods are subject to approval of the Company, which shall not be unreasonably withheld. If, however, the Company objects to the Contractor's proposed means and methods then it shall define an alternate method of construction. Upon receipt of the Company's approval or its proposed alternate method of construction, the Contractor shall commence performance of the work defined by the Company as soon as possible, and shall perform the work in a good, workmanlike, and efficient manner, using the means and methods approved by the Company, in order to permit the City work to proceed in the most expeditious manner possible, but without imposing unreasonable and/or unnecessary costs on the Company. It is expressly understood by all parties that the City's rights pursuant to Article 4 of the Contract apply to Utility Work performed pursuant to this section.

9. *Disputed utility work covered by a utility agreement:*

The City Work will continue as described in paragraph 6 above. In the event of any dispute between the Company (ies) and the Contractor regarding any issue related to the performance of, or payment for, utility work, including, but not limited to, any indirect or impact costs incurred by the Contractor due to the Utility Work and/or to the existence of facilities owned or operated by the Company (ies) on the line of the work. The Company (ies) and the Contractor hereby agree to submit to each other a "Final Offer," in writing, by certified mail. Each party shall then have three business days to consider each other's Final Offer. In the event that neither party accepts the other's Final Offer within those three days, the Company (ies) and the Contractor agree to immediately submit the dispute to binding arbitration as described in Paragraph 10. During the pendency of any arbitration, the Company (ies) and the Contractor

shall maintain separate records of the actual quantity and cost of labor, materials, and equipment expended, and to provide copies of this information to the other party on a daily basis for reconciliation. Any and all disagreement with the records maintained and provided by the other, must be documented in writing to all parties. However, these records are solely for the benefit of presentation to the arbitrator, whose decision may not necessarily be based on these records and in any event is final. Both parties should be aware that the City will not confirm or deny the accuracy of any records maintained by either party for Utility work performed pursuant to a Utility Agreement. While the arbitration is pending, the Company shall pay the Contractor on a monthly basis, based on the price offered by the Company to the Contractor for the performance of the work.

10. Arbitration of utility work:

The arbitration of the issues described above shall be conducted pursuant to the Construction Industry Arbitration Rules of the American Arbitration Association (hereinafter "the Rules" and "AAA") in effect on the date the arbitration is initiated except as set forth herein. The arbitration award shall be final and binding upon the parties to the arbitration and judgment upon the award may be entered in a court having jurisdiction.

- (a) Once an arbitrator(s) has been appointed by the AAA, the arbitration shall be scheduled as promptly as possible given the arbitrator(s) and the parties' schedules.
- (b) No later than seven days prior to the first arbitration hearing, Company and Contractor shall submit to the arbitrator(s), and to each other, a summary of each party's respective position and such other information as is deemed appropriate, along with a copy of each party's Final Offer as specified in paragraph 9.
- (c) The arbitration shall be conducted and concluded in two days.
- (d) On the morning of the first day of the arbitration, Contractor and/or representatives shall have 3 ½ hrs to make a presentation of its claim to the arbitrator. During its presentation, Contractor shall not be permitted to produce any documents or cost records which have not already been provided to the Company. Contractor shall be permitted to produce any analysis or description of its claim which has been prepared for the purpose of its presentation.
- (e) After lunch, Company and/or its representatives shall have two hours to ask Contractor questions about its claim and its presentation. Thereafter the arbitrator(s) shall have two hours to ask Contractor questions about its claim and its presentation.

- (f) On the morning of the second day of the arbitration, Company and/or its representatives shall have 3 ½ hours to make a presentation of its claim to the arbitrator. During its presentation, the Company shall not be permitted to produce any documents or cost records which have not already been provided to the Contractor. The Company shall be permitted to produce any analysis or description of its claim which has been prepared for the purpose of its presentation.
- (g) After lunch, Contractor and/or its representatives shall have two hours to ask Company questions about its claim and its presentation. Thereafter the arbitrator(s) shall have two hours to ask Company questions about its claim and its presentation.
- (h) Subject to the above time limitations, the arbitrator(s) may conduct the arbitration in such manner as the arbitrator(s) deems reasonable.
- (i) The arbitrator(s) shall then have one week to select in writing, as the arbitrator ('s) award, that party's Final Offer which appears to be more reasonable, based on the presentations at the arbitration hearings.
- (j) The arbitrator shall have no discretion to grant an award other than one of the two Final Offers submitted by the parties.
- (k) Any award for work that has already been performed shall be paid on the 7th day after receipt of the arbitrator's decision, or on the 30th day after completion of the work, whichever is later. Payment for work not yet completed at the time of the arbitrator's decision shall be paid within 30 days of completion of work. Interest shall accrue from the date payment is due at the rate of 9% per annum. Either party may cause judgment to be entered in accordance with the arbitrator(s) decision in a court in the State of New York, County of New York.
- (l) The arbitrator's fees and any other costs of the arbitration shall be initially shared equally by Company and Contractor. The non-prevailing party shall then pay all arbitrator's fees and costs of the arbitration and shall reimburse the prevailing party for its share of such fees and costs theretofore paid.
- (m) The parties may, at any time, settle any matter submitted to arbitration.

11. Order-out waiver:

The Contractor and all subcontractors hired by it, if an Interference Agreement is executed as specified between the concerned parties, agree to waive any rights they may have, if any, under law, contract or otherwise to compel the City to assert any right the City may have, including the issuance of any directives required under the New York City Administrative Code, Section 19-143 and Section 24-521, to require any or all of the Companies to maintain, repair, replace, protect, support, shift, alter, relocate, and/or remove utility facilities in connection with the work to be performed under this contract. However, nothing in this section shall preclude the City from exercising its rights under the Law to issue such a directive to the Company.

12. Cost of insurance:

Each of the named Companies, at their option and if an Interference Agreement is executed as specified between the concerned parties, may be named as an additional insured on all insurance policies required to be maintained under this contract. In the event that a Company opts to be so named as an additional insured, the actual incremental cost, if any, to the Contractor of providing such insurance coverage shall be borne by that Company. The Contractor shall provide a written statement from its insurance provider documenting the actual cost of this added coverage to the Company. Under no circumstances shall the cost of insurance coverage on behalf of any Company be borne by the City. Nothing in this paragraph shall be interpreted to imply the City's acceptance of any additional responsibility or liability for any matter related to the performance of Utility Work. In particular, the Company and the Contractor bear joint and full responsibility to ensure that any Utility Work performed by the Contractor is in compliance with all applicable government and Company regulations.

13. Cost of utility interference work:

The Companies, by virtue of a prior agreement with the City, have agreed to perform their obligations described in this section. It is expressly understood that the cost of Utility Work shall not be a charge against the City, but shall be a matter for adjustment between the Contractor and the Company or Companies concerned. The City and the Contractor agree that the Companies are third party beneficiaries of this section of the contract, if a Utility Agreement is executed between the contractor and utility company (ies). The provisions of this section shall govern in all cases where Company property interferes with or is about to be disturbed by the City work, notwithstanding any other provision of the Contract, except for Natural Gas transmission/distribution facilities covered subject to the Gas Facility Cost Allocation Act (GFCAA) and covered separately in this contract.

14. Default declaration:

The Contractor agrees that the provisions of this section are material provisions of the contract, and that the Contractor's failure to comply with the procedures set forth above are sufficient for the Commissioner to declare the Contractor in default pursuant to Article 48 of the Contract.

15. NYS Labor Law:

The Contractor is hereby advised that New York State Labor Law applies to public work. The work described in this Section U of the contract performed by utility company (ies) with their own forces or vendors hired by such company (ies) is not public work.

16. Facility operators:

The insurance requirements in Paragraph 12 of this Section U apply to: (i) additional Companies, if any, who were not named in Schedule "A" but which have executed a Utility Agreement with the contractor for utility work; and (ii) additional coverage, if any, paid for by Utility Companies whose utility facilities are located within the project limits, that they may require for the utility work pursuant to an utility agreement between the contractor and such utility companies.

[End]

"STANDARD UTILITY LETTER OF AGREEMENT"

(Name)
Deputy Commissioner, Infrastructure Division
Department of Design and Construction
30-30 Thomson Avenue
Long Island City, NY 11101

RE: City Work Performed in the Presence of Private Utility Facilities
Project No: _____

Dear (Name):

This letter is to certify that _____, has requested the inclusion of the attached "Section U: Additional contract requirements applying to work performed in the presence of privately owned utility." The company agrees to abide by the terms of this Section U and to submit a schedule listing the scope of work, including the items and estimated quantities, and types of utility facilities to be supported and protected at the company's own expenses due to interferences with the Public work.

Sincerely,

By: Authorized Company Representative

Title

NOTARY PUBLIC

CERTIFIED AS TO FORM
AND LEGAL AUTHORITY:

By: _____

SCHEDULE U-1

MIBBNC001

WEST BRANCH OF NEW CREEK

Listing of Companies for this Contract

COMPANY NAME	CONTACT NAME	TELEPHONE NUMBER
Consolidated Edison	Theresa Kong	(212) 460-4834
Time Warner	John Piazza	(718) 888-4261
Verizon	Aubrey Makhanlal	(718) 977-8165

SCHEDULE U-2
 FOR INFORMATION ONLY
 ENGINEER'S ESTIMATE OF QUANTITY AND TYPES OF INTERFERENCE
 FOR CONSOLIDATED EDISON

MIBBNC001
 HUNTER AVE, KISWICK STREET, GRIMSBY ST, NUGENT AVE, GRAHAM BLVD

CET ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY
CET 225.1A	INSTALLATION AND REMOVAL OF CATCH BASINS WITH UTILITY INTERFERENCES	EA	1
CET 225.1B	INSTALLATION OF CATCH BASINS WITH UTILITY INTERFERENCES	EA	1
CET 350	OVERHEAD ACCOMMODATION, PROTECTION OF OVERHEAD FACILITIES AND APPURTENANCES	L.S.	1
CET 351	INSTALL AND REMOVE "A" FRAME ON UTILITY POLES	EA	2
CET 400	TEST PITS FOR UTILITY FACILITIES	C.Y.	10
CET 450.1	CONSTRUCTION FIELD SUPPORT REQUIRING AVERAGE SIZE SURVEY CREW PERFORMING TYPICAL SURVEY FUNCTIONS (TYPE .1)	CRHRS	8
CET 450.2	CONSTRUCTION FIELD SUPPORT REQUIRING AVERAGE SMALL SIZE CREW CAPABLE OF PERFORMING VARIOUS TASKS (TYPE .2)	CRHRS	16
CET 450.3	CONSTRUCTION FIELD SUPPORT REQUIRING AVERAGE MEDIUM SIZE CREW CAPABLE OF PERFORMING VARIOUS TASKS (TYPE .3)	CRHRS	1

CON EDISON SCOPE OF WORK
SUPPORT AND PROTECTION

MIBBNC001

HUNTER AVE, KISWICK STREET, GRIMSBY ST, NUGENT AVE, GRAHAM BLVD

CET 225.1A	INSTALLATION AND REMOVAL OF CATCH BASINS WITH UTILITY INTERFERENCES	EA
	<i>At the following locations:</i>	
	N/W Int Jefferson Ave / Nugent Ave	
	Total quantity for CET 225.1A = 1	
CET 225.1B	INSTALLATION OF CATCH BASINS WITH UTILITY INTERFERENCES	EA
	<i>At the following locations:</i>	
	S/W Intersection Of Jefferson Ave / Nugent Ave	
	Total quantity for CET 225.1B = 1	
CET 350	OVERHEAD ACCOMMODATION, PROTECTION OF OVERHEAD FACILITIES AND APPURTENANCES	L.S.
	<i>At the following locations:</i>	
	Various Locations As Needed	
	AS SHOWN ON CONTRACT DOCUMENTS	
	Total quantity for CET 350 = 1	
CET 351	INSTALL AND REMOVE "A" FRAME ON UTILITY POLES	EA
	<i>At the following locations:</i>	
	S/E Intersection Of Hunter Ave / Kiswick St	
	S/E Intersection Of Hunter Ave / Nugent Ave	
	Total quantity for CET 351 = 2	
CET 400	TEST PITS FOR UTILITY FACILITIES	C.Y.
	<i>At the following locations:</i>	
	Various Locations As Needed	
	Total quantity for CET 400 = 10	
CET 450.1	CONSTRUCTION FIELD SUPPORT REQUIRING AVERAGE SIZE SURVEY CREW PERFORMING TYPICAL SURVEY FUNCTIONS (TYPE .1)	CRHRS
	<i>At the following locations:</i>	
	Various Locations As Needed	
	Total quantity for CET 450.1 = 8	

FOR INFORMATION ONLY
ENGINEER'S ESTIMATE OF QUANTITIES AND TYPES OF INTERFERENCE
TIME WARNER CABLE OF NEW YORK CITY
MIBBNC001
Hunter Ave., etc.
Borough of Staten Island

CET ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY
350	OVERHEAD ACCOMMODATION, PROTECTION OF OVERHEAD FACILITIES, POLES & APPURTENANCES	LS	1

TIME WARNER CABLE
SUPPORT & PROTECTION
MIBBNC001
Hunter Ave., etc.
Borough of Staten Island

CET 350 OVERHEAD ACCOMMODATION, PROTECTION OF OVERHEAD
FACILITIES, POLES & APPURTENANCES LS
At the following locations:
AS ENCOUNTERED 1

Total quantity for CET 350 1

SECTION U WORKSHEET

MIBBNC001

FOR INFORMATION ONLY

ENGINEER'S ESTIMATE OF QUANTITY AND TYPES OF INTERFERENCE

FOR VERIZON

STORM SEWER AND WATER MAIN REPLACEMENT ADJACENT TO

WEST BRANCH OF NEW CREEK (HUNTER AVENUE. ETC.)

CET ITEM NUMBER	DESCRIPTION	Unit of Measure	Estimated Quantity
CET 100.1	UTILITIES CROSSING TRENCH FOR CATCH BASIN CHUTE CONNECT. AND/OR TEST PIT (TYPE .1)	EA.	1.00
CET 102.1	UTILITIES CROSSING TRENCH FOR SEWERS OVER 24" TO 36" DIAMETER (TYPE .1)	EA.	1.00
CET 225.1B	INSTALLATION OF CATCH BASINS WITH UTILITY INTERFERENCES	EA.	1.00
CET 350	OVERHEAD ACCOMMODATION, PROTECTION OF OH FACILITIES & APPURTENANCES	L.S.	1.00
CET 351	INSTALL AND REMOVE "A" FRAMES ON UTILITY POLES	EA.	1.00
CET 400	TEST PITS	C.Y.	5.00

VERIZON CET SCOPE OF WORK
SUPPORT & PROTECTION
MIBBNC001

STORM SEWER AND WATER MAIN REPLACEMENT ADJACENT TO
WEST BRANCH OF NEW CREEK (HUNTER AVENUE, ETC.)

CET 100.1	UTILITIES CROSSING TRENCH FOR CATCH BASIN CHUTE CONNECT. AND/OR TEST PIT (TYPE .1)	EA.
	At the following locations:	
	W/S NUGENT AVENUE N/O JEFFERSON AVENUE	1.00
	Total quantity for CET 100.1 =	1.00
CET 102.1	UTILITIES CROSSING TRENCH FOR SEWERS OVER 24" TO 36" DIAMETER (TYPE .1)	EA.
	At the following locations:	
	INT. NUGENT AVENUE AND JEFFERSON AVENUE	1.00
	Total quantity for CET 102.1 =	1.00
CET 225.1B	INSTALLATION OF CATCH BASINS WITH UTILITY INTERFERENCES	EA.
	At the following locations:	
	W/S NUGENT AVENUE N/O JEFFERSON AVENUE	1.00
	Total quantity for CET 225.1B =	1.00
CET 350	OVERHEAD ACCOMMODATION, PROTECTION OF OH FACILITIES & APPURTENANCES	L.S.
	At the following locations:	
	AS ENCOUNTERED OR DIRECTED BY VERIZON FIELD REPRESENTATIVE	1.00
	Total quantity for CET 350 =	1.00
CET 351	INSTALL AND REMOVE "A" FRAMES ON UTILITY POLES	EA.
	At the following locations:	
	AS ENCOUNTERED OR DIRECTED BY VERIZON FIELD REPRESENTATIVE	1.00
	Total quantity for CET 351 =	1.00
CET 400	TEST PITS	C.Y.
	At the following locations:	
	AS ENCOUNTERED OR DIRECTED BY VERIZON FIELD REPRESENTATIVE	5.00
	Total quantity for CET 400 =	5.00

SECTION U-3

(NO TEXT IN THIS SECTION)

END OF ADDENDUM No.4

This Addendum consists of Twenty Three (23) Pages
And Eight (8) Pages of Contract Drawings



**CONSTRUCTION OF BLUEBELT IMPROVEMENTS
NEW CREEK BLUEBELT
STATEN ISLAND, NY**

SPECIFICATIONS FOR

CONTRACT MIBBNC001

**Construction of Best Management Practice, (BMP)
NC-7, NC-8, NC-9, and NC-17
Extended Detention Wetlands**

May 2014

Prepared for the NYC Department of Environmental Protection

By Hazen and Sawyer, P.C.

AS-1c

DIVISION VII - DETAILED SPECIFICATIONS –
CONTRACT MIBBNC001

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BMP CONSTRUCTION AND RELATED WORK
IN THE NEW CREEK BLUEBELT

CONTRACT MIBBNC001 CONSTRUCTION OF BEST MANAGEMENT
PRACTICES

DIVISION VII

SPECIFIC PROVISIONS

7.01 LOCATION OF WORK

Work under this Contract is to be performed on four (4) properties in the New Creek Bluebelt. The sites are on easements acquired by the New York State City Department of Environmental Protection (DEP) and are located in Community Board 2 of Staten Island. The site is approximately located between Kiswick Street and Patterson Avenue along Graham Boulevard.

7.02 WORK INCLUDED

The work under this Contract includes the construction of Best Management Practice (BMP) NC-7 and NC-8 and partial construction of NC-9 and NC-17. The following descriptions of work included under this Contract are general descriptions only and shall not be construed as a complete description of the work to be performed.

A. The principal items of work include:

1. Storm Sewer and Sanitary Sewer Networks

This entails excavation of trenches and layout of storm sewer and sanitary pipelines. The specifications and plans for this work are included elsewhere in these Contract Documents, not in this Addendum.

2. Best Management Practices (BMP) Construction

This will entail the construction of hydraulic features necessary to treat and convey stormwater runoff at the points where the storm sewer system discharges into the adjacent stream channel. Specifications and plans for this work are included in this Addendum.

The following BMPs will be constructed:

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BMP NC-7	Nugent Avenue – Extended Detention and Stream Relocation
BMP NC-8	Freeborn Street – Extended Detention and Stream Relocation
BMP NC-9	Graham Boulevard –Stream Relocation
BMP NC-17	Slater Boulevard –Stream Relocation

3. Site Restoration

The entire Project site will be restored upon project completion. The site restoration will include proper grading for permanent access and development of the BMP stormwater management facilities. Cleared areas will all be replanted with emphasis on the use of native plantings with the site layout designed to minimize the disturbance on the existing trees and plants. Boundaries will be established with the use of buffer areas where appropriate.

B. Involved Agencies and Firms

Before bidding, the contractor shall become familiar with the following involved agencies and firms and their respective responsibilities in the project:

1. New York City Department of Environmental Protection (DEP)

This City agency will maintain the facilities where BMPs NC-7, -8, -9 and -17 and the storm sewer systems are to be constructed under this project.

2. New York State Department of Environmental Conservation (NYSDEC)

This State Agency has issued a freshwater wetland permit authorizing work in regulated areas to be performed under this Contract. This Agency has the regulatory authority to inspect the work site in order to ensure that permit requirements are not violated.

3. New York City Department of Design and Construction (NYCDDC)

The NYCDDC completed the designs for the storm sewer and sanitary components of the project. They will administer and inspect the Contractor's work with regard to the installation of the storm sewers, BMPs and all other aspects of the project, including

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managing the overall project schedule, construction sequencing of the sewer work and BMP construction. The NYCDDC will handle permit compliance in relation to sewer construction. Whenever reference is made in these specifications to "the Engineer", it means the Resident Engineer on site, hired by NYCDDC.

4. Hazen and Sawyer, P.C.

This engineering firm is the design consultant for all the work contained in these specifications. They are engaged by DEP.

5. Army Corp of Engineers

This Federal Agency issues permits for all work within Federal jurisdiction wetlands. This agency has the regulatory authority to inspect the work site in order to ensure that permit requirements are not violated.

6. Restoration Specialist (Construction Monitor)

The Restoration Specialist will be retained by the NYCDDC. The Restoration Specialist shall also serve as the Construction Monitor for the construction of the BMPs. The individual or firm filling this position will be responsible for overall oversight of the complete BMP installation. This individual or firm will also focus on erosion control for the entire project, and for overseeing all work in wetland areas and ensuring that the work adheres to permit requirements. The Restoration Specialist is responsible for compliance with the permit as it relates to BMP construction. The exact powers of the Restoration Specialist (Construction Monitor) are stipulated in the wetland permit.

C. Qualifications of Contractor/Subcontractor

1. The Contractor or its proposed subcontractor shall have performed at least three (3) projects similar in scope and type within the last five years that involved the restoration and/or creation of freshwater wetland systems.

To support the Contractor's contention that the Contractor or its proposed subcontractor is qualified to perform work involving the creation or restoration of freshwater wetlands the Contractor must provide the following information in a Statement of Qualifications within three (3) days upon request by the City:

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Provide specific details on projects (i.e., location, size, cost, client, plant species, time of planting, etc.). Provide client contact person's name and telephone number. Describe any problems encountered during construction and corrective action taken to remedy the problem. Describe any violations issued by NYSDEC or any other regulatory agency. How were the violations resolved? Enclose copies of applicable wetland permits. Provide chronological photos recording the progress of the restoration and/or creation efforts, including preconstruction through completion. Include any required sign-offs from client and provide a list of all plants replaced on site.

2. The Contractor shall have performed at least three (3) contracts that involved the installation and maintenance of soil erosion and sediment control devices during construction of a project.

To support the Contractor's contention that he/she is qualified, the Contractor shall be able to provide the following information in a Statement of Qualifications, as detailed in the paragraph below.

Provide specific details on the projects (i.e., location, size cost, client, etc.). Provide client contact person's name and telephone number. Describe regulatory requirements of the erosion control devices. Describe any problems encountered during construction and operation of the devices. Discuss corrective actions taken to remedy the problem. Describe any violations issued by regulatory agencies. How were the violations resolved? Provide chronological photos recording the progress of construction and operation of the erosion control devices, including preconstruction through operation during site construction and restoration after construction.

Within three (3) days upon request by the City the Contractor shall identify a Certified Professional in Erosion and Sediment Control who will be responsible for implementation of this aspect of the project. The certification of professionals is cosponsored by the International Erosion Control Association and the Soil and Water Conservation Society. The Contractor shall also provide a copy of the certification for the person so identified.

3. The Contractor must be able to complete and submit to DCC the Statement of Qualifications described in this Section within three (3) calendar days after requested to do so by DCC.

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7.03 INSPECTION BEFORE BIDDING AND MANDATORY PRE-BID CONFERENCE

Before bidding the Contractor shall visit the site of the work. The Contractor shall obtain all necessary information, and make his own determinations of any and all conditions which may affect in any way the performance of his work and his bid prices under these Contracts. All pertinent data and dimensions with regard to existing construction shall be verified by the Contractor.

Access to the site for inspection purposes prior to bidding is on a continual basis, since the site is a public property.

All bidders are required to attend a mandatory pre-bid conference, if one should be scheduled. Exact time and place meeting place is to be announced later.

7.04 STANDARD SEWER SPECIFICATIONS

Unless otherwise specified, all work, materials, and equipment shall conform to the applicable sections of the New York City Department of Environmental Protection Standard Sewer Specifications.

7.05 INSPECTION BY THE CITY, STATE AND FEDERAL GOVERNMENT

The Contractor shall provide proper facilities for inspection and access to the work at all times, whenever it is in preparation and progress, for authorized representatives of the City, State and Federal Governments, the latter two in the presence of the Engineer.

7.06 EXISTING UTILITIES

All subsurface utility and structure information shown on the Contract Drawings were obtained from various plans and maps and field investigations, however, it is not guaranteed to be complete or accurate. It shall be the Contractor's responsibility to locate all such necessary utilities or structures by the digging of test pits prior to the start of construction and/or by contracting the Joint Underground Locating Service (JULS). No separate payment will be made for test pits or any other work related to locating existing utilities. During the progress of the work, the Contractor shall protect from damage any existing utilities or services within the work areas until, if required, they have been re-routed, disconnected or capped off.

**DIVISION VII - DETAILED SPECIFICATIONS –
CONTRACT MIBBNC001****7.07 PERMITS TO BE ACQUIRED BY DEP**

The Contractor shall become familiar with the following permits and approvals which will be obtained by DEP:

- U.S. Army Corps of Engineers Wetland Permit.
- DEC Freshwater Wetlands Permit pursuant to 6NYCRR Parts 622 and 633, and water quality certification (Protection of Waters, Public Law 95-200) pursuant to the procedures of Section 401 certification for Federal Wetland Permit;
- New York City Planning Commission authorization for alterations within the Special South Richmond Development District as designated by the City Zoning Resolution. These include modification of topography, removal of trees larger than 6 inches in caliper, and alteration of Designated Open Space; and
- New York City Planning Commission Waterfront Revitalization (Coastal Zone) Consistency Determination;

7.08 LAND FOR CONTRACTOR'S USE

It is the responsibility of the Contractor to acquire land for staging area and/or use as a construction equipment and material storage yard. Staging area, stock pile sites, and other storage locations shall be protected from erosion and stormwater runoff.

7.09 LICENSED SURVEYOR FOR ENGINEER'S USE**A. Work Included**

The Contractor shall engage the services of a New York State licensed surveyor as approved by the Engineer and reporting directly to the Engineer to make such surveys, BMP as-builts, soundings, cross sections or other measurements as may be required by the Engineer for BMP construction. Surveying services included in the item are for the sole use of the Engineer. The surveyor may be used by the Engineer to verify grades, but surveying services needed for layout of the BMP site and activities not related to BMP construction is the responsibility of the Contractor and is not provided under this item.

The Contractor for this Contract shall include in his total bid a per diem cost for the services performed by the Licensed Surveyor. This cost shall be shown on the Bid Schedule of Prices as Item No. BMP-7.09.

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The cost proposals shall include unit prices on a per diem basis and shall include all necessary equipment, including vehicles for the Surveyors.

The cost proposals shall be submitted to the Engineer for evaluation and selection.

B. Measurement and Payment

Measurement for payment shall be on a per diem basis. 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 diem rate shall include the services of a three man surveying crew. The Engineer shall be present during the progress of Work and the Engineer shall deem as to whether a full eight hour period had been employed in completing the Work, and as to whether the Contractor has utilized his crew at the productivity output required to complete the Work as anticipated. The surveyor will submit invoices to the Engineer, which will be forwarded to the Contractor for prompt payment. Payments shall be made for invoiced costs only, with no payment for overhead and profit.

7.10 CONSTRUCTION - SPECIAL REQUIREMENTS

A. Field Measurements

The Contractor shall take all necessary measurements in the field to determine the exact dimensions for all work and verify all pertinent data and dimensions shown on the Contract Drawings.

B. Excavated Material

Unsuitable excavated material shall be removed from the site together with all debris encountered in the excavations and the costs of such removal and disposal shall be included in the unit price bid for the applicable items in this Contract.

C. Access Requirements

The Contractor is advised that he shall provide access to the sites of the work for all other Contractors and that access to the sites of the work performed under all contracts shall be closely coordinated and scheduled with all other Contractors at the various sites during the life of this Contract.

D. Connections to Existing Piping

Connections to existing piping shall be made to permit ready disconnection of equipment with minimum disturbance of adjoining piping and

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equipment. The Contractor shall be responsible for the exact alignment of all piping with the existing piping and associated equipment and under no circumstances will pipe springing be allowed.

E. Noise Control

The Contractor shall implement noise control measures during construction including limits on the hours of operation and compliance with sound level standards. Those measures will comply with NYC and Federal noise requirements. The Contractor shall comply with the NYC Noise Code. No separate payment shall be made for this work; the cost thereof shall be included in the bid price for other items.

F. Dust Control

During construction, all appropriate fugitive dust control, including watering of exposed areas and using dust covers for trucks shall be employed. These measures include satisfying Section 1402.2-9.11 of the New York City Air Pollution Code. To prevent fugitive dust from construction activities from becoming airborne, the following measures are proposed:

- Use of water or surfactant to control dust in the construction operations and during the clearing and grading of land;
- Application of water to dirt paths, materials, stockpiles, and other surfaces that can generate airborne dust over extended periods. Construction of accessways would be built with properly sized stone or concrete equivalent over filtering material;
- Covering open-body trucks transporting materials likely to generate airborne dust at all times when in motion; and
- Prompt removal of earth or other material from paved streets where earth or other material has been deposited by trucking or earth-moving equipment, erosion by water, or other means.

No separate payment shall be made for this work; the cost thereof shall be included in the bid price for other items.

G. Protection of Archeological Resources

No Text

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H. Sequence of Construction

All work shall be completed in accordance with the Contract Drawings, and upon approval of the Project Engineer and the Restoration Specialist. Stake out and receive approval from the Restoration Specialist for the limits of work before beginning any clearing.

Landscaping is not included in construction sequencing; the contractor must receive approval for all of the landscaping work from the Restoration Specialist prior to construction.

1. Perform soil sampling and report results to the Engineer, as per specification 7.317.
2. Install perimeter erosion control measures, including construction limit fence, reinforced silt fence, and tree guards around limits of disturbance as shown in the Contract Drawings and directed by the Engineer.
3. Perform general site clearing and grubbing.
4. Perform site grading per Contract Drawings.
5. Install headwalls, pipe collars, forebays, micropools, and weir chambers per Contract Drawings.
6. Once complete, perform a site grading and install erosion control measures such as jute mesh or equivalent and seed all graded areas excluding permanent pools.

Note landscaping is not included in Construction Sequencing. Landscaping plans and schedule are provided in the Contract Drawings. See Contract Drawings for detailed suggested sequence of construction.

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7.11 TRANSPORTATION AND HANDLING OF MATERIALS AND EQUIPMENT

A. General

1. Contractor shall make all arrangements for transportation, delivery, handling and rigging of equipment and materials required for prosecution and completion of the work.
2. Working space on the site is limited. Equipment shall not be delivered to the site until it can be moved directly to the area where it will be utilized.
3. If necessary to move stored materials and equipment during construction, the Contractor shall move or cause to be moved materials and equipment without any additional compensation.
4. The Contractor shall take all necessary provisions to prevent inadvertent deposition and spillage of excavated soils or other materials that are being transported from the project site. The Contractor must employ the use of the truck tracing pad, wheel washing stations or other equipment deemed necessary to prevent spillage and deposition from vehicles from other construction equipment.

B. Delivery

1. The Contractor shall arrange deliveries of products in accordance with construction schedules and in ample time to facilitate inspection prior to installation.
2. Coordinate deliveries to avoid conflict with work and conditions at the site and to accommodate the following:
 - a. Work of other Contractors.
 - b. Limitations of storage space.
 - c. Availability of equipment and personnel for handling products.
3. Do not have products delivered to project site until related Working Drawings have been approved by the Engineer.
4. Do not have products delivered to site until required storage facilities have been provided.

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5. Do not have products delivered to site until the manufacturer's recommended storage instructions have been submitted and approved.
6. Have products delivered to site in manufacturer's original, unopened, labeled containers. Keep Engineer informed of delivery of all equipment to be incorporated in the work.
7. 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.
8. Immediately upon delivery, inspect shipments to assure:
 - a. Product complies with requirements of Contract Documents and approved submittals.
 - b. Quantities are correct.
 - c. Containers and packages are intact, labels are legible.
 - d. Products are properly protected and undamaged.

C. Product Handling

1. The Contractor shall provide equipment and personnel necessary to handle products by methods to prevent soiling or damage to products or packaging.
2. Provide additional protection during handling as necessary to prevent scraping, marring or otherwise damaging products or surrounding surfaces.
3. Handle products by methods to prevent bending or overstressing.
4. Lift heavy components only at designated lifting points.
5. Materials and equipment 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.

D. Removing and Hauling Equipment and Materials

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1. The Contractor shall inspect all items including all boxes, crates and packages containing equipment and 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.
2. The Contractor shall then carefully remove the equipment and materials from the truck or trucks on which it is shipped. The equipment and materials shall then be transported to the place of installation at the job site. The Contractor shall be liable for loss or damage to the equipment and materials that may occur while being unloaded, transported, stored or installed.
3. All equipment that arrives at the job site during normal working hours shall be unloaded as soon as practicable.

7.12

PROTECTION OF MATERIALS AND EQUIPMENT AT THE SITE

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.

Storage of any mechanical or electrical equipment out of doors 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.

All mechanical equipment shall 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.

Should storage of mechanical equipment become necessary before it can be stored at the Site, the Contractor shall provide storage in a weatherproof warehouse.

Materials may be stored out of doors if supported above ground surface on wood runners and protected with approved, effective and durable covers.

All storage and protection of materials and equipment at the Site shall be subjected to the approval of the Engineer.

All costs for equipment protection including warehousing or other work to meet the scheduled completion date shall be deemed to be included under the Contract and no additional payment will be made.

7.13

FINAL CLEANING

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A. Final Cleaning Under This Contract

1. At the completion of the work, the Contractor for this Contract shall remove all rubbish from and about the site of the work, and all temporary structures, construction signs, tools, scaffolding, materials, supplies and equipment which he or any of his subcontractors may have used in the performance of the work. The Contractor shall broom clean paved surfaces and rake clean other surfaces of grounds.
2. The Contractor shall thoroughly clean all materials, equipment and structures installed under this Contract; all marred surfaces shall be touched up to match adjacent surfaces.
3. The Contractor shall clean all landscaped areas of all debris and any objectionable material, as determined by the Engineer, and shall remove all such debris off-site.
4. The Contractor shall remove all temporary erosion control measures and replace with final features as shown on the plans and other Contract Documents contained herein, as directed by the Engineer.

B. Cleaning Materials and Methods

The Contractor shall:

1. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
2. Use each type of cleaning material on only those surfaces recommended by the cleaning material manufacturer.
3. Use only materials which will not create hazards to health or property.
4. The Contractor shall only use cleaning methods approved by the Engineer.

C. Payment for Final Cleaning

No separate payment will be made for the aforementioned work, the cost thereof shall be included in the price bid for other items of this Contract.

7.14 OSHA REQUIREMENTS

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The Contractor shall comply with all applicable OSHA rules and regulations regarding hazardous materials. The Contractor's specific attention is called to OSHA Regulation 29 CFR, Part 1920.120.

7.15 NO SEPARATE PAYMENT

No separate payment shall be made for the work specified in the Specific Provisions. All costs shall be included in the various Contract items unless otherwise specified.

7.16 BID BREAKDOWN

The Contractor shall submit a breakdown of the bid prices of this Contract within 15 days after the commencement date specified in the Notice to Proceed. The bid breakdown shall be by reference to every detailed specification section listed for the Contract Item, including physical quantities, material costs, unit costs, and installation costs, where applicable. In addition, separate amounts for the following shall be included in the bid breakdown:

Bond, Insurance and Mobilization
Final Working Drawings, Record Drawings

7.17 DETAILED WORK DESCRIPTION OF BMP

NC-7: Nugent Avenue

BMP NC-7 is located on about 4.7 acres of DEP Bluebelt property that is generally bounded by Hunter Avenue to the west, Kiswick Street and Nugent Avenue to the north, residential properties to the east, and Freeborn Street to the south. The BMP site consists of the installation of an extended detention wetland, forebays, and a weir chamber to treat and detain stormwater runoff. This BMP will provide stormwater velocity attenuation and water quality improvements.

NC-8: Freeborn Street

BMP NC-8 is located on about 0.7 acres of DEP Bluebelt property situated between Freeborn Street to the north and Olympia Boulevard to the south and immediately downstream of NC-7. The proposed BMP will consist of a drainage outlet, an extended detention wetland, and a micropool. This BMP will provide stormwater velocity attenuation and water quality improvements.

NC-9: Graham Boulevard

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BMP NC-9 is located on about 4.4 acres of DEP Bluebelt property immediately south of NC-8, bounded by Olympia Boulevard to the north and Patterson Avenue to the south with residential properties to the east and west. The proposed main BMP inlet and channel will convey the West Branch of New Creek from NC-7 and NC-8.

NC-17: Slater Boulevard

BMP NC-17 is located on about 9.7 acres of DEP Bluebelt property to the east of NC-9, bounded by Olympia Boulevard to the northwest, Slater Boulevard to the northeast, and residential properties. The proposed main BMP inlet and channel will convey the West Branch of New Creek to the main channel.

Specification Section

Specific Provisions

7.09 Licensed Surveyor

Structures and Misc. Equipment

7.101 Work Included
7.102 Dewatering
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7.110 Sheeting and Bracing
7.111 Valves
7.113 Miscellaneous Piping
7.114B FRP Weir Plates
7.117 Graffiti Resistant Coating
7.120 Trash Rack
7.129 Concrete Structures
7.133 Check Valve

Mortared Stone Wall

7.201 Work Included
7.202 Masonry Mortar
7.203 Masonry Accessories
7.204 PA Colonial Field Stones

Earthwork and Grading

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7.300	Work Included
7.301	Debris Removal and Disposal
7.302	Clearing, Grubbing, and Removals
7.303	Temporary Wooden Tree Guards
7.304	Excavation
7.305	Crushed Stone
7.306	Tree Removal and Disposal
7.307A	Grading
7.308	Fill On-Site
7.310	Plant and Sod Salvage
7.312	Demolition and Site Clearing
7.317	Soil Sampling and Disposal

Landscaping and Restoration

7.400	Work Included
7.401	Landscaping for Terrestrial Zone and Wetland Zone
7.403	Top Soil for Restored Area
7.405	Vector, Pest and Wildlife Control
7.407	Jute Mesh
7.408B	Herbicide Application
7.410	Plant Protection Fence
7.414	BMP As-Built Plans
7.415	Vine and Invasive Plant Removal
7.418	Sand
7.419	Tree and Root Pruning

Erosion and Sedimentation Control Measures

7.500	Soil Erosion and Sedimentation Control Measures
7.502	Construction Limit Fence
7.504	Reinforced Silt Fence
7.505	Sand Bag
7.506	Sediment Trap with Filter
7.509A	Stabilized Construction Entrance
7.512	Dirtbag
7.517	Slope Stabilization Mat

Perimeter Site Security/Access Control Measures

7.600	Work Included
7.602	Boulder Provision and Placement
7.603	Fixed and Removable Steel Pipe Bollards
7.605	Sign Installation on Steel Rail Posts
7.606	Permanent Access Way

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- 7.608 Survey Bollards and Monuments
- 7.618 Surveying Services for Location of Boundary Points
- 7.620 Aluminum Pipe Railing
- 7.622 Forebay/Micropool Sediment Clean-out Indicator

Stream Bank Stabilization

- 7.700 Work Included
- 7.705 Erosion Control Mat
- 7.710 Reno Mattress

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STRUCTURES AND EQUIPMENT

7.101 WORK INCLUDED

Under structures and equipment work, Contractor shall furnish all labor, materials and equipment and shall do all work as specified herein and as shown on the Contract Drawings, including all incidental and appurtenant work required for a complete job.

The work shall include items of work specified under the following sections:

<u>Section No.</u>	<u>Title</u>
7.102	Dewatering
7.103	Concrete
7.104	Steel Reinforcement
7.105	Welding
7.107B	Rip Rap Stone/Angular Natural Field Stone
7.109	Geotextile Fabric
7.110	Sheeting and Bracing
7.111	Valves
7.113	Miscellaneous Piping
7.114B	FRP Weir Plates
7.117	Graffiti Resistant Coating
7.120	Trash Rack
7.129	Concrete Structures
7.133	Check Valve

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7.102 DEWATERINGA. Description of Work

The Contractor shall furnish, install, operate and maintain dewatering equipment as required, for BMP and Bluebelt work as specified herein. The dewatering equipment shall include, but not be limited to, the following equipment items:

1. Pumps
2. Piping
3. Accessories
4. Wells

B. General Requirements

1. General Specifications - Work performed under this Section shall be in conformance with the Standard Sewer Specifications.
2. Examination of the Sites - The Contractor shall take all steps that he considers necessary to familiarize himself with the surface and subsurface conditions at the site, and shall obtain the data that is required to analyze the water and soil conditions at the site.
3. Shop Drawings - The Contractor shall submit to the Engineer for approval shop drawings and any other material required to substantiate conformance with the requirements set forth in the specifications. Shop drawings shall include a detailed plan of operations.

C. Dewatering

1. General Information - The Contractor shall perform dewatering activities to insure that all construction is performed under dry conditions. If a well point system is proposed, the Contractor shall utilize a licensed well driller. The Contractor shall always drill down to sand or gravel layer when available and when it is below the lowest excavated invert.

The Contractor shall operate the dewatering pumps continuously, a day before and during construction until all associated work within the influence zone of the well point have been completed.

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2. Care and Disposal of Water - Care of water shall be in accordance with Section 15 - 15.25 of the Environmental Conservation Law.

Water from open cut and/or sheeted excavations, manholes, structures, trenches, or from whatever source, shall be disposed of strictly in accordance with methods approved by the Engineer.

The Contractor shall submit proposed dewatering methods to the New York State Department of Environmental Conservation for the required permits. If a well point dewatering system is proposed, the Contractor shall utilize a licensed well driller. Contractor shall contact NYSDEC a minimum of two (2) weeks in advance of dewatering system startup.

When required by the Engineer, such water shall be passed through a settling basin and tank of acceptable size and shape and equipped with an overflow. Each settling basin shall be cleaned as required and as ordered by the Engineer.

Sufficient water to flush all sewers and drains shall be provided by the Contractor when necessary. If any sewer, drain, catch basin, inlet or gutter, that receives dirty water attributable to the Site, should become filled or partially filled with sediment or debris, the Contractor shall promptly and satisfactorily remove such deposits.

D. Design Criteria

1. Provide dewatering system which will effectively reduce hydrostatic pressure and lower groundwater levels below excavation levels as necessary for safe and proper prosecution of the work and which will result in obtaining stable, substantially dry subgrade for prosecution of subsequent operations.
2. Design dewatering methods so that the effluent discharge from the sediment control measures (sump pit, sediment tank) does not impact surface water using the following protocol which was developed to monitor dewatering effluent discharge:

a. Monitoring of Dewatering Operations

Prior to the start of dewatering operations, a visual inspection of the installation of the sediment control measure(s) such as a dewatering sump pit and/or a portable sediment tank shall be made by the Engineer. Upon commencement of dewatering effluent discharge from the sediment control measures, at least three turbidity

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measurements of the effluent shall be conducted over a 15 minute-period using the following methodology. If the arithmetic mean of these three turbidity measurements is greater than three (3) times the ambient turbidity level or 50 NTUs, whichever is less, all dewatering operations shall be discontinued until the Engineer is consulted regarding additional control measures. If the ambient turbidity level is greater than 50 NTUs, the dewatering effluent discharge shall not exceed the ambient turbidity level unless otherwise directed by the Engineer.

b. Determination of Ambient Turbidity

Ambient turbidity levels of surface waters shall be determined using a Hanna Instruments HI 93703 Portable Microprocessor Turbidity Meter available from Hanna Instruments, Inc., Woonsocket, RI or Orbeco Hellige Portable Turbidity or LaMotte Portable Turbidimeter or equivalent approved by the Engineer. Ambient turbidity measurements shall be collected under dry weather conditions. Dry weather conditions are defined as no precipitation in the preceding 48 hours. A minimum of three turbidity measurements shall be collected using as follows:

- Water samples shall be collected a minimum of 20 feet upstream of the work area prior to commencement of any construction activity.
- Water samples shall be collected without disturbing stream bank or stream bed sediments.
- The turbidity measurements shall be conducted according to the instructions provided in the unit's Operational Guide which are summarized below.
- After the meter has been turned on, fill a clean cuvet up to one quarter inch from its rim with thoroughly agitated sample.
- Allow sufficient time for bubbles to escape before securing the cap.
- Wipe the outside of the cuvet thoroughly with a lint-free tissue.
- Place the cuvet into the cell of the meter.

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- Press the Read key and the LCD will display a blinking "SIP" (Sampling in Process). The turbidity value will appear after approximately 25 second.

The arithmetic means of the three dry weather upstream turbidity measurements shall be the ambient turbidity level. Turbidity shall be measured in Nephelometric Turbidity Units (NTUs).

E. Submittals

Submit the following for approval:

1. Working Drawings
 - a. Type of dewatering system proposed, showing arrangement, location and depths of proposed system, complete description of equipment and materials to be used, procedure to be followed, standby equipment, standby power supply and proposed location(s) of points of discharge of water.
 - b. Obtain approval from the Engineer and appropriate regulatory agencies prior to installation of system.

F. Job Conditions

1. Subsurface Conditions
 - a. Subsurface investigations and groundwater level determinations shall be conducted by the Contractor prior to implementation as specified herein.
2. Responsibilities
 - a. Select and install dewatering system to accomplish groundwater control as specified.
 - b. Monitor quality of discharge from dewatering system to determine if soil particles are being removed by system.
 - c. Measure to ascertain if movement is caused in adjacent areas by dewatering operations; take approved measures to minimize such movement.
 - d. Take measures to prevent damage to property.

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- e. Repair as approved damage, disruption or interference resulting directly or indirectly from dewatering operations.
- f. Remove sediments from all intercepted groundwater or surface water as specified herein and approved by the Engineer and the jurisdictional agency concerned. Under no circumstances shall the Contractor directly discharge, without treatment, into the drainage channel or creek.

G. Sump Pit

The Contractor, at the direction of the Engineer shall provide a stone filled pit with perforated standpipe/nozzle wrapped with filter fabric in which intercepted groundwater is pumped to an approved location.

The size and shape of the sump pit will vary due to site conditions. The size of pump should be determined from manufacturer's specifications.

- 1. The standpipe shall be a perforated 12"-24" diameter corrugated or PVC pipe.
- 2. A base of 2" aggregate shall be placed in the pit to a depth of 12". After installing the standpipe, the pit surrounding the standpipe shall then be backfilled with 2" aggregate.
- 3. The standpipe shall extend 12"-18" above the lip of the pit.
- 4. The standpipe shall be wrapped with filter cloth before installation. If desired, 1/2" x 1/2" hardware cloth may be placed around the standpipe, prior to attaching the filter cloth. This will increase the rate of water seepage into the pipe.

H. Surface Drainage

- 1. Intercept and divert surface drainage away from BMP or other excavations, wells by use of dikes, ditches, swales, open stone lined channel, temporary diversion pipes which could be either on the surface or buried, sumps or other means. To properly install buried diversion pipe the contractor may be required to excavate.
- 2. Design surface drainage systems to prevent erosion on or off the site or unwanted water flow.
- 3. Remove surface drainage system when no longer required.

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4. Remove debris and restore site(s) to original conditions.

I. Drainage Of Excavated Areas

1. Provide and maintain ditches of adequate size to collect surface and subsurface water and seepage which may enter excavations and divert water into sump so that it can be drained or pumped into drainage channels as approved by the Engineer and the jurisdictional agency concerned.
2. Install settling basins or other approved apparatus as necessary to reduce amount of fine particles carried by water diverted away from excavation.
3. When no longer necessary, backfill and seal drainage ditches, sumps and settling basins with approved material.

J. Execution

1. Install dewatering system as specified and with the approval of the Engineer.
2. Demonstrate by approved methods that no soil particles are present in water after 12 hours of initial pumping or draining and additionally as directed.
3. Dispose of precipitation and subsurface water away and clear of the work area. Keep excavation dry.
4. Maintain continuous and complete effectiveness of the installation.
5. Maintain water level at such elevation that no damage to structure or plant material can occur because of excessive hydrostatic pressure. In any event, maintain water level two feet minimum below bottom of subgrade until sufficient concentrate work or backfilling or both has been completed to adequately offset uplift pressures.

K. Dewatering System Removal

1. Remove and dispose of all stone, filter fabric and piping that comprise curtain drains and/or sump pits used in dewatering in accordance with Federal, State and local regulations at a permitted site.

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2. Backfill remaining space as necessary to restore surface and subsurface to its original or proposed condition in accordance with the Engineer's approval.

L. No Separate Payment

Dewatering work shall be performed by the Contractor only as directed by the Engineer. The cost for all labor, materials and equipment required for the Dewatering shall be deemed included in the bid price for other Contract Items. No separate payment shall be made for Dewatering.

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7.103 CONCRETEA. Work Included

Description - The Contractor shall furnish, and place all structural and nonstructural concrete as indicated on the Contract Drawings and as specified herein. Nonstructural concrete does not include steel reinforcement and is used for stone embedment, sidewalks, pedestrian ramps, curbs, concrete cores, mud mats, cradles and fill concrete or as noted on the Contract Drawings.

B. General Requirements

1. General Specifications - The General Specification: 11-Concrete (Dated November 1991) and Standard Sewer Specifications of the Department of Environmental Protection (DEP) is declared to be part of this specification, the same as it is fully set forth elsewhere herein. Copies of this specification may be obtained from the Department. Concrete work shall conform to all requirements of that specification except as modified by this Detailed Specification.

2. Submittals

The Contractor shall submit to the Engineer for approval shop drawings and other materials required in accordance with the requirements set forth on the Contract Drawings and the Specifications in accordance with the Standard Sewer Specifications. Submittals shall also include all material required under the "Submittals" section of the chapters of General Specification 11, Concrete, and any additional submittals hereinafter specified.

C. Detailed Requirements

The reference numbers in this Detailed Specification are keyed to the chapters and section numbers of General Specification 11; the first number(s) to the left of the first decimal designates the chapter and the subsequent numbers to the right of the first decimal designate the sections within the chapter. The Detailed Specifications herein shall take precedence over the Sewer Specifications, December 1996.

1.4.1.6 The Engineer shall be responsible for all concrete inspections (including semi-controlled inspection).

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- 2.1 Coarse and Fine Aggregates for Concrete shall be well graded in accordance with 2.6.1.1. Maximum size of coarse aggregate shall be 3/4". All sieve sizes (1-1/2" to No. 200) shall be used in determining grading of both coarse and fine aggregates.
- 2.2.4 Contractor shall submit to the Engineer for approval a minimum of two (2) suppliers of aggregate he proposes to use.
- 2.2.5 Contractor shall furnish confirmation to the Engineer that he can obtain 100% of the needed aggregates from one area prior to approval to place concrete.
- 2.3 Maximum cementitious material factor shall be 680 lbs/cu. yd of concrete for 4000 psi concrete.

For concrete mixed with only Portland Cement, the total alkalis in the cement (calculated as the percentage of Na_2O plus 0.658 times the percentage of K_2O) shall not exceed 0.40%.

For concrete mixed with Portland Cement and an appropriate amount of fly ash, the total alkalis in the Portland Cement (calculated as the percentage of Na_2O plus 0.658 times the percentage of K_2O) shall not exceed 0.85%.

An approved mineral admixture Type F (Fly Ash) shall be substituted for cement in the ratio of 20% by weight

- 2.4 All concrete, unless noted otherwise on the Contract Drawings, shall be air entrained and contain a water reducing or high range water reducing admixture. For proportioning of air content and admixtures, see Chapter 3, Sections 3.5, 3.6 and 3.8.
- 3.3 All concrete shall be Class 40, 4000 psi based on 28 day compressive test. All concrete shall be proportioned and tested in accordance with Section 1.4.3 of the General Specifications 11 - Concrete, unless noted otherwise.
- 3.4 All concrete shall be normal weight. Lightweight Concrete shall not be used unless noted otherwise.
- 3.6 Slump:
1. Slump for all concrete shall be 3 +/- 1 inches, unless indicated otherwise.

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2. 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 3-inch slump. The slump after addition of the high range water reducing admixture shall not exceed 8 inches when measured at the point of placement.
 3. A tolerance of up to 2 inch above the maximum indicated slump shall be allowed for one batch in any five consecutive batches tested provided that it can be demonstrated that the specified water-cementitious material ratio is not exceeded.
- 3.5.1.1 When the above tolerances are exceeded, the condition shall be immediately investigated and corrective action taken. Corrective action may include modification of the mix as required by the NYC Building Code. A report of the condition and the remedial action taken shall be filed with the Engineer designated for Controlled Inspection within 48 hours.
- 4.3.7.1 Form ties for all structures containing or resisting liquid pressure shall have water stops at mid-thickness of the wall.
- 5.3 Deformed billet steel bars shall comply with the requirements of ASTM A615, grade 60.
- 6.4 Expansion Joints
- 6.4.1 General Information - Expansion joints with joint fillers and joint sealants shall be constructed where shown and as indicated on the Contract Drawings.
- 6.4.2 Materials and Installation
- 6.4.2.1 Joint Fillers - Expansion joint filler shall conform to ASTM D1752, Type 1. The joint sealant shall be separated from the filler by a suitable bond breaker of polyethylene film or tape as recommended by the sealant manufacturer.
- 6.4.2.2 Joint Sealants
- a. A two component thiokol polysulfide base synthetic rubber sealant such as Pecora Synthacalk GC-2, Sonneborn-DeSoto Sonolastic 2-part, or approved equal shall be used in all expansion joints in concrete and

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masonry and wherever else specified or shown on the Contract Drawings.

It shall be furnished in pour grade or gun grade depending on installation requirements. Primers shall be used as called for by the manufacturer. The sealant shall be furnished in colors as directed by the Engineer.

- b. A two component pourable polyurethane sealant such as Pecora NR-300, Sonneborn-DeSoto Sonolastic Paving Joint Sealant SL-2, or approved equal shall be used in all concrete floors subject to heavy traffic and wherever else specified or shown on the Contract Drawings.

- 6.4.2.3 Installation of Joint Fillers and Sealants - Joint fillers and sealants shall be installed in accordance with manufacturer's recommended procedures and as shown on the Contract Drawings. Adhesive for holding sponge rubber joint filler to concrete shall be Scotchgrip Cement No. 1300 as manufactured by Minnesota Mining and Manufacturing Co, or W.R. Meadows, Inc., or approved equal.

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.

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 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.

6.5 Waterstops

6.5.1 Work Included

- 6.5.1.1 Description - The Contractor shall furnish and install all waterstops for expansion and construction joints as indicated on the Contract Drawing, specified herein or required for a complete installation.

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6.5.1.2 General Requirements

1. General Specifications - Waterstops shall be manufactured from virgin polyvinylchloride and shall meet or exceed all requirements set forth in the U.S. Corps of Engineers Specification CRD C572.
2. Samples - The Contractor shall submit to the Engineer one (1) sample of each type of PVC waterstop. Each sample is to include a splice.

6.5.2.1 General Information - Prior to installation, the Contractor shall submit layout drawings for approval, showing diagrammatically or otherwise the extent of the waterstop installations that are proposed to ensure that all construction and expansion joints will be watertight. The drawings shall include elevations, sections, etc. and all details to show that a continuous watertight installation shall be provided.

Construction joints made in other than positions shown on the Contract Drawings for the convenience of the Contractor are subject to the Engineer's approval and shall have water stops installed in these non-indicated construction joints at no additional cost to the City.

6.5.2.2 Materials and Installation

1. Materials - All 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.

The required minimum physical characteristics for this material are per ASTM D-638:

Tensile strength	-	1,750 psi
Ultimate elongation	-	not less than 280%

No reclaimed PVC shall be used for the manufacture of the waterstops. The Contractor shall furnish certification that the proposed waterstops meet the above requirements.

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Waterstops for construction joints shall be flat ribbed type, 6 inches wide with a minimum thickness at any point of 3/8 inches.

Waterstops for expansion joints shall be ribbed with a center bulb, 9 inches wide with a minimum thickness at any point of 3/8 inches. Center bulb shall have an outside minimum diameter of 1 inch and an inside minimum diameter of 1/2 inch.

2. Installation - Waterstops shall be installed in the work so that they are embedded to an equal depth in concrete on both sides of the joint and the waterstops shall be kept free from oil, grease, mortar or other foreign matter. Waterstops shall be adequately secured against movement during the pouring of concrete. Forms adjacent to waterstops shall be rigidly constructed and braced to prevent the concrete from leaching through joints and the displacement of waterstops due to power vibrating of the concrete. Concrete adjacent to waterstops shall be placed in 12 inch lifts and power vibrated to prevent honeycombing, voids and separation of aggregates at the surfaces of concrete separation joints.
 - a. Splices - Splices at the intersection of runs of waterstops shall be made by heat sealing the adjacent surfaces in accordance with the manufacturer's recommendations using a thermostatically controlled electric source of heat. Only straight butt joint splices will be allowed in the field. 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 80% of the unspliced material before any is used in the work.
 - b. Defective Work - Defective work, as determined by the Engineer, shall be remedied by cutting and rebuilding the concrete walls and slabs, replacing the waterstop assemblies or remedied by other methods as approved by the Engineer.
 - c. Responsibility - The final responsibility for constructing a watertight condition at expansion

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joints and construction joints remains with the Contractor as part of the work under this Contract.

6.6.2.1 The Contractor shall coordinate and/or provide for the installation of anchor bolts, pipes, sleeves, inserts, chases, recesses, and all other embedded items, required in the work.

6.6.5.3 The Contractor shall submit equipment pad layout drawings.

6.7 Precast Concrete

A. The Contractor shall furnish and install all precast items shown or specified in the Contract Documents, including all appurtenances necessary to make a complete installation. This section does not include prestressed or postensioned concrete.

B. Without limiting the generality of other requirements of these specifications all work hereunder shall conform to the applicable requirements of the referenced portions of the following documents, to the extent that the requirements therein are not in conflict with the provisions of this Section.

1. Precast Prestressed Concrete Institute Standard MNL -117.
2. ASTM C478 Specification for Precast Reinforced Concrete Manhole Sections.
3. ACI 318 Building Code Requirements for Reinforced Concrete.
4. ACI 350 R - Concrete Sanitary Engineering Structures.

C. Submittals

1. The Contractor shall submit shop drawings for all precast concrete items. Submitted drawings shall show all dimensions, location and type of lifting inserts, and details of reinforcement and the method of anchorage of surrounding work.

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2. For all precast items which are manufactured, the Contractor shall also submit a list of the design criteria used by the manufacturer.
 - a. For all precast items which are manufactured, and which have a clear dimension, in any direction, greater than or equal to 4'-0", the Contractor shall submit design calculations per criteria stated on contract drawings. The precast concrete calculations shall be stamped and signed by a Professional Engineer registered in the State of New York.
3. The Contractor shall submit approved ICBO reports for all lifting inserts, showing allowable design loads on the inserts.

D. Quality Assurance

1. Precast concrete units shall be made by an experienced manufacturer and shall be constructed as shown on the Drawings and specified herein and 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.
2. The Contractor shall notify the Engineer a minimum of 24 hours prior to casting and when the units have been fabricated and await the Engineer's consent prior to shipping to the site.
3. The Engineer may elect to examine the units at the casting yard or upon arrival of same at the site. The Engineer shall have the option of rejecting any or all of the precast work if it does not meet with requirements shown on the Drawings or specified herein. All rejected work shall be replaced at no additional cost to the City.

E. Products

1. The joint sealing compound shall be Quik-Seal, a preformed, cold applied, ready to use plastic joint sealing compound as supplied by Quikset Utility

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Vaults, Santa Ana, California; Ram-Nick by K.T. Snyder Company; or approved equal.

2. Mortar used between the sections of precast concrete manholes and vaults shall be as recommended by the manhole section manufacturer.
3. Non-shrink grout shall be used where grouting is required.

F. Design

1. The precast concrete units shall be designed for the dead load of the units plus a minimum superimposed horizontal Truck load of H20 for the spans shown on the Drawings unless shown or noted otherwise on Drawings.
2. Deflection shall not exceed 1/360 of span at design load.

G. Fabrication

1. All precast items shall be fabricated in accordance with PCI Manual for Quality Control for Plants and Production of Architectural Precast Concrete Product.

H. Installation

1. Required pads, plates and reinforcing bars shall be furnished for casting and anchorage in the adjoining work. The precast concrete units shall be installed with the units tight and at right angles to the supporting beams or walls. The units shall be aligned and leveled in accordance with the procedures recommended by the manufacturer. Units shall be grouted by a mixture of not less than one part cement to three parts fine sand, care being taken to see that joints are filled. Damp grout that may have seeped through shall be removed before it hardens.
2. All openings in the precast units shall be made by the Contractor and are the responsibility of the

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Contractor. Where details for an opening are not shown on the Drawings, the opening shall be made in accordance with the recommendation of the manufacturer.

- a. For precast planks, when an opening causes a loss in carrying capacity of the unit, the adjacent units shall be designed to carry the additional dead and superimposed load transferred from the unit with the opening. The Contractor shall provide saddle headers to transfer the load to adjacent members.
3. Damaged units shall be replaced at no additional cost to the City.

8.7.6 Connecting Concrete to Existing Structures

- A. Where new concrete work is to be made integral with existing concrete work, the Contractor shall proceed as follows and as shown or specified.
 1. Roughen surface of existing concrete by chipping.
 2. Cut existing concrete where required or as indicated on the contract drawings.
 3. Where it is necessary to expose existing reinforcement, the reinforcing rods shall be cleaned by wire brushing and new reinforcement shall be hooked into existing reinforcement and lapped, drilled into existing concrete and set with an approved adhesive, or welded as directed. Proper preheating shall be required prior to welding. Clearance around each bar shall be in accordance to ACI 318 requirements.
 4. Where expansion anchors are shown, holes shall be drilled in the existing concrete as indicated on the contract documents and to the minimum depths as recommended by manufacture so as to provide a minimum bond strength of 125% of yield.
 5. Waterstops to be set into existing concrete shall be as shown on the Contract Drawings.

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6. Thoroughly wash all surfaces and install waterstops and reinforcing steel as required.
 7. Apply bonding compound in strict conformance with the manufacturer's instructions.
 8. Apply new concrete in strict conformance with bonding compound manufacturer's recommendations.
- B. Where portions of existing concrete structures or masonry bulkheads are to be removed and where the remaining concrete is to be finished smooth, the Contractor shall do the following as a minimum:
1. Remove concrete or masonry to the depths shown on contract drawings or required by the Engineer.
 2. Cut off projecting reinforcement to a depth of at least 2 inches measured from the finished concrete surface. Where shown, reinforcement shall be bent across cut face and covered with new concrete.
 3. Thoroughly coat the roughened concrete surfaces by applying bonding compound in strict conformance with the manufacturer's instructions.
 4. Cement mortar shall be placed to a thickness slightly in excess of the finished surface and shall be steel-trowel-finished, flush with the adjacent surfaces.
 5. The color of new concrete in the exposed surfaces shall match the color of the existing adjoining concrete as closely as possible.
 6. Cement mortar shall consist of one part Portland cement and two parts of sand by volume.

Whenever new concrete is connected to existing concrete, the existing concrete shall be coated with bonding compound. Surface preparation, application and curing shall be done in strict accordance with the manufacturer's directions.

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8.7.7 Cutting and Patching Opening for Pipe and Other Penetrations in Existing Concrete

- A. The Contractor shall cut the existing concrete within the limits required, expose the existing reinforcement, and perform the work in such manner to prevent damage to the existing adjacent concrete and/or equipment. Unless otherwise permitted, line drilling is required. The exposed reinforcement shall be cleaned by wire brushing, then cut and bent to permit the installation and finally bent around the new pipe or thimble. Additional reinforcement shall be provided as shown on the Contract Drawings. When reinforcing is required to be welded to structural members, the work shall be done by approved and licensed welders using size and length of beads shown on the Contract Drawings.
- B. Coating of the existing concrete shall be as previously specified under Section 8.7.6. Non-shrinking grout shall be used for setting wall casting, sleeves and wherever called for into existing concrete.
- C. Dowels and anchors shall be set with an approved epoxy adhesive in strict accordance with manufacturer requirements.
- D. Openings shall be provided with keyed joints meeting the Engineer's approval prior to coating and patching.
- E. Where such work will be visible in the completed work, the adjacent surfaces shall be made to match as closely as possible.

8.10.5 Non-Shrink Grout - Non-shrink, non-staining grout shall be "Euco N-S" by the Euclid Chemical Company, or "Masterflow 713" by Master Builders, or approved equal. Non-shrink grout shall be mixed and placed in strict accordance with the directions of the manufacturer.

Non-shrink grout shall be used for setting the structural items where as noted on the Contract Drawings.

8.12 Concrete Sealer

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Concrete sealer shall be a one (1) part polyurethane sealer and dustproof, "Eucothane" as manufactured by the Euclid Chemical Company, or approved equal.

Concrete sealer shall be applied on all equipment pads.

8.13 Pigmented Admixture

This section describes Pigmented Admixture for coloring Portland cement mixtures.

It shall be certified by the manufacturer that the Pigmented Admixture shall comply with the requirements of ACI 212.3R.-10, Section 6.1., as water-reducing admixtures, and that their water reducing components have been tested for compliance with ASTM C-494 (Specification for Chemical Admixtures for Concrete). It shall be certified by the manufacturer that the Pigmented Admixture shall consist of pure synthetic mineral oxide only, and shall comply with ASTM Designation C979. It shall also be certified by the manufacturer that the Pigmented Admixture shall be single-component admixture, complying with both ASTM C494 and ASTM C979, not as a combination of two or more additives or admixtures.

The pigmented Admixture shall produce a color equal to the standards on file at the office of the New York City Department of Transportation, Bureau of Highways, Division of Roadway Engineering, 40 Worth Street, New York, NY 10013 and The Landmarks Commission, 225 Broadway, 23rd Floor, New York, NY 10007. The color shall be approved by the Engineer.

The Pigmented Admixture manufacturer shall certify that when used at the recommended dosage, the pigmented admixture has no effect on or increases the compressive strength of the concrete by 5-10% when compared with a control batch of the same mix design and slump but without the Pigmented Admixture. Testing shall be done at 28 days after depositing, and shall be measured in pounds per square inch. The test results shall be an average of at least three (3) cores of cylinders per test.

Calcium Chloride shall not be used in the composition of the admixture nor in the composition of the concrete.

The Pigmented Admixture shall be packaged by the manufacturer in incremental amounts by weight for a single cubic yard of

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concrete, with the designated dosage clearly marked on each package.

Air entraining agent complying with ASTM Designation C260 shall be used in combination with the Pigmented Admixture.

No other agents or admixtures shall be used with the Pigmented Admixture in the concrete, unless stated in writing by the manufacturer of the Pigmented Admixture to be of no consequence to the colorfastness of the concrete mixture.

The Pigmented Admixtures shall be mixed and delivered in accordance with ASTM Designation C 94.

The same type and brand of cement, source of sand and water/cement ration shall be maintained for each load of concrete used in the entire project.

The slump of the concrete shall remain consistent throughout the project at four inches. If held-back water is added at the job site, the concrete should be mixed at mixing speed for an additional five minutes after addition of the water and before depositing.

The Contractor shall furnish for approval and on site a concrete sample for each color specified using the Pigmented Admixture. The sample shall be at least 4' x 4' x 4" and shall be given the specified surface texture and cured with the methods specified for the concrete installation. The Contractor shall not order the admixture until the samples are approved by the Engineer. Once approved, the samples shall be used for assessing color conformance of pigmented concrete installed.

Water must not be sprinkled or otherwise added to the surface of the slab during finishing. Evaporation retardants may be fog-sprayed provided they are not detrimental to the finished color of the concrete.

8.13.1 Curing Membrane

If the concrete is pigmented as per this Section, the curing membrane shall be of the liquid-membrane forming type and shall be color-matched to the pigmented concrete. Additionally, the curing membrane shall be of a type recommended by the Pigmented Ad mixture manufacturer and shall conform to both ASTM C309 and all local, State, and Federal regulations concerning volatile organic compounds (VOC). Plastic sheeting,

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burlap, paper, or other unspecified material shall not be used as a curing membrane.

Prior to making any field samples and the placing of any colored concrete, the Contractor, concrete supplier, engineer-in-charge, and/or city representative shall meet and discuss methods of handling the colored concrete.

8.13.2 Measurement and Payment

The quantity to be measured for payment under this Section shall be the total number of cubic yards of approved additional or requested concrete placed as directed by the Engineer.

The contract price per cubic yard of approved structural and nonstructural concrete shall be as indicated on the BID SCHEDULE OF PRICES, Item No. BMP-7.103-A (Non-Structural) and Item No. BMP-7.103 (Structural). The bid price shall constitute full compensation for all labor, materials, equipment and work incidental thereto, necessary to complete this item in accordance with the plans and specifications to the satisfaction of the Engineer.

10.4 Rubbed Finishes

The following shall be produced on concrete which has met the requirements of smooth form finish (Section 10.3.2).

10.4.1 Smooth Rubbed: Where this finish is required, it shall be applied no later than one day following form removal. No 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 brick or other abrasive to eliminate irregularities until uniform color and texture are produced. 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 brick. Brush finishing or painting with grout or neat cement will not be permitted.

10.5.2 Smooth Rubbed Finish (Section 10.4.1) - for all other exterior surfaces and interior vertical surfaces.

10.5.3 Smooth Form Finish (Section 10.3.2) - for all other interior overhead surfaces exposed to public view and interior walls of tanks/culverts.

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10.5.4 Grout Cleaned Finish (Section 10.4.2) - for all exposed surfaces to be painted.

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7.104 STEEL REINFORCEMENTA. Description of Work

1. The Contractor shall furnish and install all reinforcing steel as indicated on the Contract Drawings and specified herein.

2. General Requirements

a. General Specifications - Steel reinforcement, electrically welded mesh and steel wire shall conform to the requirements of Chapter 5 - General Specification 11, - Concrete, November 1991 and the Standard Sewer Specifications, December 1996.

Metal chairs, ties or wires shall not extend to the concrete surfaces. Approved form ties shall provide deep recesses which shall be carefully filled with grout after forms are stripped.

b. Shop Drawings - The Contractor shall submit to the Engineer for approval, shop drawings and other material required to substantiate conformance with the requirements set forth on the Contract Drawings and the Specifications. Shop drawings shall include, but not be limited to the requirements of General Specification 11 - Concrete.

Detailed placing and shop fabricating drawings, prepared in accordance with ACI 315 shall be furnished for all concrete reinforcement. These drawings shall be made to such a scale as to clearly show construction joint locations, openings, the arrangement, spacing and splicing of the bars. No materials shall be cut or fabricated until related drawings have been approved by the Engineer.

c. Submittals - The Contractor shall also submit the following:

- 1) Mill test certificates.
- 2) A description and sample of the reinforcing steel manufacturer's marking pattern.
- 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.

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B. Execution

1. General Information - The Contractor shall install under this Section of the Detailed Specifications all steel reinforcement required for a complete installation for the structural work of this Contract. Bar sizes shall be as indicated on the Contract Drawings except as otherwise ordered or approved by the Engineer.
2. Materials and Installation - The steel reinforcement shall conform to the requirements as hereinbefore specified and to General Specification 11 – Concrete, Chapter 5 - Reinforcement. Reinforcing bars shall be deformed new billet steel bars conforming to ASTM A615, Grade 60. Wire mesh reinforcement shall conform to ASTM A185.
3. Welding - Wherever welding of reinforcing rods to other reinforcement or structural shapes is indicated, the welding of reinforcing steel shall conform to General Specification 11 – Concrete, Chapter 5.
4. Coiled Reinforcing – Shall not be permitted.
5. Mechanical Couplers – Hot-forged sleeve type couplers shall not be used.
6. Dowel Adhesive System - Where shown on the 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. Thoroughly clean drill holes of all debris and drill dust with wire brush prior to installation of adhesive and reinforcing bar. The embedment depth of the bar shall be per manufacturer's recommendations, so as to provide a minimum allowable bond strength that is equal to 125 percent of the yield strength of the bar, unless noted otherwise on the Drawings. Engineer's approval is required for use of this system in locations other than those shown on the Drawings.
7. 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.

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- b. 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.
- c. Reinforcing steel shall at all times be protected from conditions conducive to corrosion until concrete is placed around it.

8. Placing

- a. Reinforcing steel shall be accurately positioned as shown on the Drawings and shall be supported and wired together to prevent displacement, using annealed iron wire ties or suitable clips at intersections. All reinforcing steel shall be supported by concrete, plastic or metal supports, spacers or metal hangers which are strong and rigid enough to prevent any displacement of the reinforcing steel. Where concrete is to be placed on the ground, supporting concrete blocks (or dobies) shall be used in sufficient numbers to support the reinforcing bars without settlement. In no case shall concrete block supports be continuous.
- b. The portions of all accessories in contact with the formwork shall be made of plastic or steel coated with a 1/8 inch minimum thickness of plastic which extends at least 1/2 inch from the concrete surface. Plastic shall be gray in color.
- c. Tie wires shall be bent away from the forms in order to provide the specified concrete coverage.
- d. Reinforcing bars additional to those shown on the Drawings, which may be found necessary or desirable by the Contractor for the purpose of securing reinforcing in position, shall be provided by the Contractor at no additional cost to the City.
- e. Reinforcing placing, spacing, and protection tolerances shall be within the limits specified in ACI 318 except where in conflict with the Building Code, unless otherwise specified.
- f. Reinforcing bars may be moved within one bar diameter as necessary to avoid interference with other concrete reinforcing, conduits, or embedded items. If bars are moved more than one bar diameter, or enough to exceed placing tolerances, the resulting arrangement of bars shall be as acceptable to the Engineer.

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- g. Welded wire fabric shall be supported on slab bolsters spaced not less than 30 inches on centers, extending continuously across the entire width of the reinforcing mat and supporting the reinforcing mat in the plane shown on the Drawings.
- h. Bars with kinks or bends not shown on the Drawings shall not be used.

9. Splicing

- a. The length of lap for reinforcing bars, unless otherwise shown on the Drawings shall be in accordance with ACI 318 for a class B splice.
- b. Laps of welded wire fabric shall be in accordance with ACI 318. Adjoining sheets shall be securely tied together with No. 14 tie wire, one tie for each 2 running feet. Wires shall be staggered and tied in such a manner that they cannot slip.
- c. Mechanical splices shall be used only where shown on the drawings or when approved by the Engineer.
- d. Couplers which are located at a joint face shall be a type which can be set either flush or recessed from the face as shown on the Drawings. 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 O-ring seal.

C. No Separate Payment

No separate payment shall be made for this work of this specification. All costs shall be included in the various Contract Items of this Contract.

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7.105

WELDING

A.

Description of Work

1. The Contractor shall perform all welding as indicated on the Contract Drawings and as specified herein.

B.

General Requirements - All welding shall be in accordance with specified standards as modified or supplemented by these Specifications. No welding shall be done when the base-metal temperature is lower than 32 degrees Fahrenheit. The subcontractor shall be responsible for the quality of the welding and shall set up and record procedures for welding all metals included in the work, Welding shall not be started until procedure, welders, and welding operators have been qualified by tests and copies of all records and reports submitted for approval. Costs of such testing shall be borne by the Contractor. Each weld shown or indicated on the Contract Drawings shall be made as specified on the approved procedure specifications provided to cover each type of weld. Welding of any special steel shall adhere, without deviation, to the written instructions of the steel manufacturer.

1. Welded Construction - Welded construction shall be used only where indicated on the Contract Drawings and approved shop drawings. The AWS Specification D1.1 (latest edition) Structural Welding Code or AWS D1.4 (latest edition) Structural Welding Code - Reinforcing Steel, as applicable and other requirements of this Section shall apply to the welded joints. Unless otherwise specified, welding shall be by automatic submerged arc or semi-automatic submerged arc,
2. Test Specimens - Test specimens shall be prepared by the Contractor for each type of welded joint as designated in paragraph entitled Procedure Qualification. Destructive tests of specimens for procedure and welder qualifications shall be conducted in accordance with AWS D1.1, Section 4, Qualifications, and the requirements specified herein.
3. Groove Welds - All groove welds shall be 100 percent complete penetration welds as defined in AWS D1.1 or shown in 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.

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C. Welding Procedure

1. General Information - Welding procedures and procedure qualification tests shall be required for all welding covered by this specification to demonstrate that the combination of process, material, and technique produces the desired welds. These procedures, when qualified, become the welding procedure specification which must be followed in making weldments on materials within ranges shown in the Contract Drawings (and Specifications), and provide a means of assuring reproducible results and quality control. Procedure specifications and procedure qualification test results shall be kept by the Contractor and shall be available for examination by the Engineer. Five copies of the procedure specifications and test results shall be submitted for approval. Welding procedure specifications and tests shall be individually identified or completed on the shop details and erection drawings. Welding shall not be performed on any contract item before approval of procedure specification and qualification testing by the Engineer.
 - a. Welding Procedure Specification - A separate Procedure Specification shall be prepared for each type of weld which varies in accordance with the definition of essential changes as listed in AWS D1.1, Section 5.
 - b. Procedure Qualification - Each type of weld made by a specific process shall be qualified by tests as specified in AWS D1.1 or as specified herein for reinforcing steel.
 - c. Procedure Specification Requalification - When an essential variable, as specified in AWS D1.1, is changed, the procedure must be requalified.
 - d. Dissimilar Steels - Where dissimilar steels are welded together, the procedure shall be the same as for the lower-strength steel.
 - e. Groove Welds - All groove welds shall be 100 percent complete penetration welds as defined in AWS D1.1 or shown in 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.

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- f. Welded Studs - Gun welded studs shall conform with the requirements of AWS D1.1, Section 7.
- g. Electrodes - Electrodes for structural steel welding shall conform with AWS D1.1, Section 4, as applicable.

D. Performance Certification Of Welders And Welding Operators

- 1. General Information - Each welder and welding operator assigned to work on this Contract shall be certified in conformance with AWS D1.1, the requirements of this Specification. Welders shall be New York City certified, and all welding shall be done in conformity with the New York City Building Code.
 - a. Welder's Certificates - Upon completion of the applicable qualification tests, each welder and welding operator shall be provided with a certificate by the Contractor. The certificate shall state the type of welding and positions for which he is qualified, the code under which he is qualified, and the firm or individual certifying the qualification tests. The certificate shall be kept on file at the job site by the Contractor and shall be made available for examination and approval by the Engineer. The certificate will remain in effect except when requalification of the welder or welding operator is required as specified in AWS D1.1 and the requirements of this Specification.
 - b. Welder's Identification - The Contractor shall assign each welder identifying number, letter, or symbol which shall be used by the welder to identify all welds made by him. For identification, the welder shall lightly stamp his symbol adjacent to the weld by means of a metal stamp.
 - c. Welder's Record - The Contractor shall maintain a record of all welders and welding operators employed on the Contract showing the date and results of tests and the identification mark assigned to each welder. These records shall be certified by the Contractor and made accessible to authorized personnel. Copies of the record shall be furnished to the Engineer.
 - d. Technique - Technique shall conform to AWS Specification D1.1, Section 4, entitled Technique, and the requirements of this Specification.

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E. Supervision

All shop and field welding shall be under the immediate supervision of a representative of a standard testing agency or an approved inspection agency reporting directly to, and under the control of, the Department of Design and Construction. The Contractor shall submit the name of such agency to the Commissioner for approval before starting work. The costs of all welding inspections and tests shall be borne by the Contractor.

F. Inspection and Tests During Construction

The Engineer will make periodic checks of each welder to determine that welds are being made as specified in the approved procedure specifications. Welding speed may be estimated. All welds will receive 100 percent visual inspection by the Engineer to determine weld size and profile, surface cracks, overlap, and undercut. The Engineer reserves the right to perform any test on any weld, including liquid penetrant, magnetic particle, radiographic, and ultrasonic.

G. Acceptance Requirements

1. Welds, other than stud welds, are acceptable if inspection indicates conformance within the following limitations:
 - a. Cracks - All welding exhibiting any cracks, either in the weld metal or the parent metal, will be rejected.
 - b. Undercut - Undercut shall not be more than 1/32 inch deep.
 - c. Convexity or Reinforcement - Convexity or reinforcement of a weld face shall not exceed the limits shown in AWS D1.1, and there shall be no overlap.
 - d. Fusion - Incomplete fusion or lack of penetration will not be allowed.
 - e. Small Inclusions - Slag inclusions, porosity, and other fusion defects less than 1/16 inch in greatest dimension will be allowed if well dispersed and the sum of the greatest dimensions in any linear inch of welded joint does not exceed 3/8 inch.
 - f. Large Inclusions - Slag inclusions, porosity, and other fusion defects 1/16 inch or larger in greatest dimension will be allowed providing such defects do not exceed the limits specified in AWS D1.1.

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H. Repair of Defective Welds

1. In lieu of rejection of an entire piece or member containing welding which is unsatisfactory or which indicates inferior workmanship, the corrective measures listed hereunder may be permitted by the Engineer whose specific approval shall be obtained for making each correction. Corrective measures shall be made at the Contractor's expense and to the satisfaction of the Engineer and/or an acceptable independent testing lab
2. Defective or Unsound Welds or Base Metal - Defective or unsound welds or base metal shall be corrected either by removing and replacing the entire welds, or as follows:
 - a. Convexity and Overlap - Excessive convexity and overlap, defined in paragraph Acceptance Requirements, shall be reduced by removal of excess weld metal.
 - b. Concavity - Any concavity of weld, crater, undersize welds, undercutting: clean and deposit additional weld metal.
 - c. Discontinuities - Excessive weld porosity, slag, inclusions, defined in the paragraph entitled Acceptance Requirements, and incomplete fusion: remove defective portions and reweld.
 - d. Cracks - Cracks in weld or base metal: remove crack throughout its length, including sound weld metal 2 inches beyond each end of the crack; follow by the required rewelding.
3. Removal - The removal of weld metal or portions of the base metal shall be done by chipping, grinding, oxygen cutting, oxygen gouging, or air carbon-arc and in such a manner that the remaining weld metal or base metal is not nicked or undercut. Defective portions of the weld shall be removed without substantial removal of the base metal.
4. Additional Metal - Additional weld metal shall be deposited using an electrode smaller than that used for making the original weld, and not more than 5/32 inch diameter. The surface shall be cleaned thoroughly before welding.
5. Inaccessibility - Where work performed subsequent to the making of a deficient weld has rendered the weld inaccessible or has caused

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new conditions which would make the correction of the deficiency dangerous or ineffectual, the original conditions shall be restored by removing the welds or members, or both, before making the corrections, or the deficiency shall be compensated for by additional work done according to an approved revised design.

6. Caulking - Caulking of welds shall not be permitted.
7. Improper Fit - Improperly fitted parts may be cut apart and rewelded. Members distorted by welding shall be straightened by mechanical means or by carefully supervised application of a limited amount of localized heat. The temperature of heated areas shall not exceed 1,200 degrees F (a dull red color). Temperature shall be carefully measured with temperature indicating crayons during the heating operation. Parts to be heated for straightening shall be substantially free of stress and from external forces, except those stresses resulting from mechanical means used in conjunction with the application of heat.
8. Peening - No peening shall be done on the root or surface layers of a weld. Peening of intermediate weld layers may be used only if authorized by the Engineer and directed by him. Care shall be exercised to prevent overpeening which may cause overlapping, scaling, cracking, flaking, or excessive cold working of weld and base metal.

I. No Separate Payment

No separate payment shall be made for this work of the specification. All costs shall be included in the various Contract Items of this Contract.

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7.106

OUTLET STILLING BASIN

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CONTRACT MIBBNC0017.107B RIP-RAP STONE /ANGULAR NATURAL FIELD STONEA. Description of Work

Under this item, the Contractor shall perform all work necessary to install rip-rap stone or angular natural field stone where directed by the Engineer, 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.

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.

Angular natural field stone shall be utilized to stabilize, reinforce or restore naturally occurring features as well as features that are intended to appear natural, such as stream side slopes, banks and bottoms, wetlands, shorelines subject to erosion, culvert inlets and outlets, outlet stilling basins and natural upland side slopes.

Rip-rap stone may be substituted with angular natural field stone as directed by the Engineer. The Contractor may use field stones excavated in the project site, contingent upon the approval of the Engineer.

B. Materials UsedRip-Rap Stones/Angular Natural Field Stones

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.

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.

Stones for rip-rap shall be hard, durable quarry materials. Stones used for natural field stones shall be hard, durable field materials and shall be dark in coloration. 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.

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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. Construction Methods

Subgrade Preparation

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.

Rip-Rap/Angular Natural Field Stone Placement

Placement of the stones shall follow immediately after placement of the filter. 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 filter when placing the stones.

The toe of the stones shall be keyed into a stable foundation at its base as shown on the Contract Drawings. 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.

D. Measurement and Payment

The quantity to be measured for payment under this Section shall be the total number of cubic yards of approved stones, measured in stockpiles, containers and/or vehicles and placed as directed by the Engineer.

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The contract price per cubic yard of approved stone material placed shall be as indicated on the **BID SCHEDULE OF PRICES** Item No. **BMP-7.107-B**. The bid price shall constitute full compensation for all labor, materials, equipment and work incidental thereto, necessary to furnish, place and incorporate and all other work incidental thereto, in accordance with the plans and specifications to the satisfaction of the Engineer.

The contract price per cubic yard of approved stone material furnished and delivered shall be as indicated on the **BID SCHEDULE OF PRICES** Item No. **BMP-7.107-C**. The bid price shall constitute full compensation for all labor, materials, equipment and work incidental thereto, necessary to furnish and deliver rip-rap stone in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.108A

ALUMINUM GRATING

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7.109 GEOTEXTILE FABRIC

A. Description of Work

Under this item, the Contractor shall furnish all equipment and perform all work necessary to place geotextile fabric as indicated in the Contract Drawings and specifications and as directed by the Engineer.

B. Construction Methods

The geotextile fabric shall be Enkadrain 9120 or equivalent with the following specifications:

<u>Property</u>	<u>Test Method</u>	<u>Unit</u>	<u>Specification</u>
Material	Non-woven geotextile fabric		
Unit Weight	ASTM D1777	oz/sq. yd	4.3 (min)
Flow Rate	Falling Head Test	gpm/sq. ft.	120 (min)
Puncture	ASTM D751	lbs.	60 (min)
Thickness		in.	0.8 (min)

C. Measurement and Payment

The quantity to be measured for payment under this Section shall be the number of square feet of surface area on which Geotextile Fabric has been installed in accordance with the plans and specifications and directions of the Engineer.

The contract price per square ft. of Geotextile Fabric shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.109. The bid price shall include the costs for all labor, material, equipment and incidental work in accordance with the plans and specifications to the satisfaction of the Engineer.

The cost for all labor, materials and equipment required to place the geotextile fabric under the concrete structures shall be deemed included in the price bid under detailed specifications for concrete structures Section 7.129.

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7.110 SHEETING AND BRACING

A. Description of Work - The Contractor shall furnish and install sheeting together with all bracings as required for excavations in accordance with the provisions contained herein.

B. General Requirements

1. Shop Drawings - The Contractor shall submit to the Engineer for approval, shop drawings and other material required to substantiate conformance with the requirements set forth on the Contract Drawings and these Specifications.
2. Calculations - The Contractor shall submit to the Engineer for approval design calculations of his proposed sheeting and bracing plan. Such calculations shall incorporate all applicable loads as per the New York City Building Code and shall be signed and sealed by a New York State licensed professional engineer. The Contractor shall include with the calculations his detailed plan of operation as regards to the installation of the sheeting, method of excavation and removal of sheeting for the review by the Engineer.
3. The Contractor shall have at least three (3) projects similar in scope and type within the last five years in driving sheet piles.
4. The Contractor shall be responsible for the adequacy of all sheeting and bracing and for all damage resulting from sheeting and bracing failure or from placing, maintaining and removing it.

C. Construction Sheeting

1. General - Sheeting required by the Contractor for sheeting excavations, etc. shall be designed and submitted by the Contractor for the Engineer's review. Sheeting shall be removed at the conclusion of construction unless otherwise indicated or approved by the Engineer. Sheeting shall be either steel or wood sheeting as specified herein below.
2. Steel Sheeting - Sheeting shall conform to the requirements of ASTM A328. Sheet piles shall be new and shall be of the continuous interlock type of the section, length and weight shown on the Contract Drawings.
3. Structural steel and other accessories such as walers, braces, tie-rod assemblies, plates and similar members used with sheet piling shall conform to ASTM A36.

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4. Fastening - Bolts, nuts and washers shall conform to the requirements of ASTM A325 or A307. Connections shall be provided by the Contractor in accordance with AISC Specification for the Design, Fabrication and Erection of Structural Steel. Connections shall be subject to the Engineer's approval. Welding shall conform to the requirements of Detailed Specification 7.106, Welding.
5. Wood Sheeting - Timber of wood sheeting shall be Douglas Fir standard grade or Southern Yellow Pine No. 25R with extreme fiber unit bending stress not less than 1200 psi. All lagging shall be full size lumber (undressed), and shall be sound, free from shakes, large knots, and other defects which might impair its strength. Used timber may be furnished if equal in strength to that of corresponding new timber. Where conditions require tight sheeting to prevent loss of ground, tongue and groove wood sheeting shall be used.
6. Sheeting to be Left in Place - Construction sheeting to be left in place shall be indicated on the drawings. The Contractor shall cut off piling 2 ft. below ground surface or to the grades shown on the Contract Drawings.
7. Bracing and Anchorage - Bracing and anchorage shall be shown on the shop drawings.
8. Installation - The Contractor shall examine the areas and conditions under which steel sheet piling is to be installed. The Contractor shall notify the Engineer in writing of conditions detrimental to the proper and timely completion of the work. The Contractor shall not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.

D. No Separate Payment

The quantity to be measured for payment under this Section shall be the total number of square feet supplied and installed in accordance with the plans and specifications and direction of the Engineer.

All costs for the installation of sheeting and bracing performed in conjunction with the construction and installation of concrete structures will be included under the unit bid price for Concrete Structures Section 7.129.

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7.111 VALVES

A. Description of Work: The Contractor shall furnish, shop test, install, adjust, field test and place in satisfactory operation the valve, and auxiliary equipment as shown on the Contract Drawings, specified herein and as required for a complete installation.

B. General Requirements

1. Shop Drawings. The Contractor shall submit to the Engineer for approval shop drawings to substantiate conformance to the requirements set forth on the Contract Drawings and these Specifications. Shop drawings shall include, but not be limited to, outline and dimensional drawings including detailed sections of the equipment, complete equipment and component identification, and material specification.

Drawings shall include comprehensive schematic diagrams showing wiring for each individual item of electrical equipment and all interconnecting wiring, comprehensive schematic diagrams showing all hydraulic elements; the latter to be clearly indicated so it can be furnished and installed by others, if such is applicable.

A listing of the quantity and type of recommended lubricants, spare parts and special tools and appliances to be furnished shall be included with the shop drawing submittal.

C. Gate Valves

1. Gate valves shall be flanged end, metal seated, rising stem type valves. Bodies, gates and stems shall be Type 304 stainless steel. Flanges shall be carbon steel. Packing shall be TFE impregnated synthetic fiber. Valves shall have offset, bevel gear operators arranged as shown on the drawings. Valves shall be DeZurik gate valves or equal.
2. All buried valves and other valves located below the operating deck or level, specified or noted to be key operated, shall have an operator shaft extension from the valve or valve operator to finish grade or deck level, a 2-inch square AWWA operating nut. All valves shall have a 5 1/4 " valve box with a locking lid with a 5 point hex head brass bolt. The locking lid shall be as manufactured by Star Pipe Products or approved equal.

Except as otherwise specified, all buried valves shall be painted with 2 coats of asphalt varnish in accordance with the requirements of

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AWWA Standard C 500. This protective coating shall be protected from damage until the valve is backfilled.

3. All operators, unless otherwise specified, shall turn counter-clockwise to open. All valve operators shall be provided with the valve by the valve manufacturer. The valve manufacturer shall be solely responsible for the selection of the proper operator to meet the operating conditions specified herein. Field calibration and testing of the operators and valves to ensure a proper installation and an operating system shall be the responsibility of the valve manufacturer.

All valves shall have a minimum design pressure rating of 150 psi and capable of a test pressure of 300 psi. Buried service valves shall have mechanical joint pipe ends. Buried service valves shall be provided with AWWA operating nuts, extension stems and cast iron valve boxes. Extended valve stems, stem guides and operating nuts shall be provided as indicated or required.

4. Valves for buried service for nominal pipe sizes 3 to 12 inches shall be resilient seats and non-rising stems with double O-ring seals conforming to AWWA C509. The ends of valve ends shall be flanged, mechanical joint, or Aring-title joint as required for the type of pipe used. Valves shall be provided with 2 inch square operating units.

D. Execution

1. Installation

The procedures regarding unloading, inspection, storage and where applicable installation, described in the Appendix of AWWA C500 entitled Installation, Operation and Maintenance of Gate Valves shall be used for all valves.

All valves shall be manually opened and closed before installation to check their operation, and the interior of the valves shall be cleaned. Valves shall be placed in the positions shown on the Drawings.

2. Valve Supports

Valves shall be supported as integral components of the piping systems.

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All horizontally mounted valve operators whose weight exceeds 25 pounds shall be supported independently of the valve and piping system.

All vertically mounted valve operators whose weight exceeds 100 pounds shall be supported independently of the valve and piping system.

Valve supports shall anchor the valves against an unbalanced force in either direction. The magnitude of the force shall be based on a pressure equal to twice the maximum working pressure with a maximum allowable stress of 2 of the supports yield strength.

3. Testing

All valves shall be hydrostatically field tested at the aforementioned test pressures. Any leakage or sweating of joints shall be stopped and all joints shall be tight.

Testing shall be performed in accordance with the specifications and the ANSI and/or AWWA standards contained herein including leakage tests. Copies of the certified test results shall be provided by the manufacturer to the Contractor and submitted to the Engineer for approval.

The Contractor shall obtain and submit certified statements that the valves comply with the requirements of the standards specified herein.

4. Painting and Coatings

Valves shall be shop primed for interior and exposed piping service and shall be coated for buried service with a one (1) mil coating in conformance with the outside coatings.

E. No Separate Payment

No separate payment shall be made for this work of the specification. All costs shall be included in the various Contract Items of this Contract.

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7.112

STONE PIERS FOR PEDESTRIAN/VEHICLE ENTRANCE

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7.113 MISCELLANEOUS PIPINGA. Work Included

Contractor shall furnish, install, test and place into satisfactory operation all piping and fittings as shown on the Contract Drawings and specified herein. Work performed under this Section shall conform to the NYCDDC General Specifications for Sewer Construction, except as specified and/or modified herein.

B. Piping Materials1. Ductile Iron Pipe and Fittings:

Ductile iron pipe and fittings shall comply with the requirements of the NYCDDC General Specifications for Sewer Construction except as modified herein.

- a. Ductile iron piping thickness classification shall be Class 54 or 56 as stated in Paragraph GS-30.4 of GS-30, respectively.
- b. All flexible couplings and flanged coupling adapters with the exception of piping encased in concrete shall be harnessed as shown on the Contract Drawings.
- c. Push-on Joints: Conform to ANSI A21.11 for rubber ring compression push-on joint.

2. Reinforced Concrete Pipe

Reinforced Concrete Pipe and fittings shall comply with the requirements of General Specifications 51A and the NYCDDC Standard Sewer Specifications, section 5.02.

- a. Size
 - 1) Precast reinforced concrete pipe shall be of the sizes prescribed in ASTM Designation C76.
 - 2) Size of pipe shall be as specified.
- b. Materials, Workmanship And Finish
 - 1) Concrete - The Concrete shall be a homogeneous mixture of such proportions and quality that the pipe

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will conform to the design and test requirements of these specifications. In no case, however, shall the proportion of Portland Cement in the mixture be less than six (6) bags per cubic yard of concrete. Each bag shall be ninety-four (94) pounds.

- 2) Cement - Cement shall be Portland Cement (Type II - Moderate Sulfate Resistant).
- 3) Aggregates - Fine aggregate and coarse aggregate shall conform to the requirements of General Specification 11.
- 4) Concrete Reinforcement - Reinforcing steel shall be steel bars or steel wire fabric conforming to the requirements of General Specification 11. Steel reinforcing shall be circular.

C. Extra Strength Vitrified Pipe

Extra strength vitrified pipe sewers and fittings shall comply with the requirements of the NYCDDC Standard Sewer Specification Section 5.03.

D. Installation

1. General

- a. Store and handle pipe in accordance with requirements of AWWA C600, latest revision and additional requirements of the manufacturer.
- b. Install piping as shown on the Contract Drawings, specified herein and as recommended by the manufacturer.
- c. Request instructions from Engineer before proceeding if there is a conflict between the manufacturer's recommendations and the Contract Drawings or Specifications.
- d. Pipe, fittings and accessories that are cracked, damaged or in poor condition or with damaged linings shall be rejected.
- e. Make sure that the inside of the piping is free from dirt and debris prior to and during installation. Remove debris from installed piping prior to testing.

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E.

Buried Pipe:

1. Conform to manufacturer's instructions and to AWWA C600 where applicable.
2. Provide pipe bedding for all buried piping as shown on the Contract Drawings.
3. Pipe, fittings and specials shall be carefully lowered into the trench in a manner as to prevent damage to the pipe or pipe coatings.
4. Install all pipe accurately to line and grade shown unless otherwise approved by the Engineer. Remove and relay pipes that are not laid correctly.
5. Slope piping uniformly between elevations given.
6. When it is necessary to deflect pipe from a straight line either in the vertical or horizontal plane, the maximum deflection shall not exceed 75 percent of the manufacturer's recommended values for the joint.
7. Ensure that water level in trench is at least 6 inches below bottom of pipe. Do not lay pipe in water. Maintain dry trench until jointing and backfilling are complete.
8. Start laying pipe at lowest point and proceed toward the higher elevations, unless otherwise approved by the Engineer.
9. Place bell and spigot pipe so that bells face the direction of laying, unless otherwise approved by the Engineer.
10. Excavate around joints in bedding and lay pipe so that only the barrel receives bearing pressure from the trench bottom.
11. Blocking under piping shall not be permitted unless specifically excepted by the Engineer for special conditions. If permitted, conform to requirements of GS-30.18 and GS-30.19.
12. Prior to laying pipe every precaution shall be taken to ensure that no foreign material enters the piping. Interior of all pipe and fittings shall be inspected and all dirt, gravel, sand, debris or other foreign material shall be completely removed from pipe interior before it is moved into the trench. Bell and spigot mating surfaces shall be thoroughly wire brushed and wiped clean and dry immediately before pipe is laid.

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13. All pipe and fittings shall be carefully examined for cracks, damage or other defects while suspended above the trench before installation. Defective materials shall be immediately removed from site.
14. Every time that pipe laying is not actively in progress, the open ends of pipe shall be closed by a water-tight plug or cap.
15. Field cutting pipe, where required, shall be made with a machine specially designed for cutting piping. Tools as allowed by GS-30.18, if in accordance with the pipe manufacturer's recommendations, shall be used for field cutting ductile iron pipe. If these tools are not recommended by the manufacturer, the manufacturer's recommended tools shall be used in the work. Cuts shall be carefully done, without damage to pipe or lining, so as to leave a smooth end at right angles to the axis of pipe. Cut ends shall be tapered and sharp edges filed off smooth. Flame cutting will not be allowed.
16. Touch up protective coating in a satisfactory manner prior to backfilling. Joint coatings and touch up shall be applied equal to the shop applied coatings.
17. No pipe shall be completely backfilled until the Engineer approves of the installation after demonstration of successful testing.

F. Testing

1. Test all piping as specified below except as otherwise authorized by the Engineer.
2. Notify the Engineer 48 hours in advance of testing.
3. Provide all testing apparatus, including pumps, hoses, gages and fittings.
4. Pipelines shall hold the specified test pressure for a period of 2 hours.
5. Pipelines which fail to hold specified test pressure or which exceed the allowable leakage rate shall be repaired and retested.
6. Test pressures required are at the lowest elevation of the pipeline section being tested unless otherwise specified.

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7. Conduct all tests in the presence of the Engineer. Repeat tests in the presence of local authorities having jurisdiction if required by them.

G. Measurement and Payment

The quantity to be measured for payment under this Section shall be the total number of linear feet of Miscellaneous Pipe furnished in accordance with the plans and specifications and directions for the Engineer. The contract price per linear feet of 12-inch diameter ductile iron pipe, as indicated on the BID SCHEDULE OF PRICES is Item No. 7.113. The bid prices shall be a unit price per linear feet of pipe furnished and installed and shall include all work such as, but not limited to, excavation, sheeting, crushed stone, backfill and any other necessary work to furnish and install miscellaneous pipe.

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7.114B FRP WEIR PLATESA. Work Included

1. Description - The Contractor shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install fiberglass-reinforced weir plates complete and operational with all anchor bolts, fasteners and accessories.
2. Shop Drawings - The Contractor shall submit to the Engineer for approval shop drawings and other material required in accordance with the requirements set forth on the Contract Drawings and the Specifications. Shop drawings include, but are not limited to:
 - a. Manufacturer's literature, illustrations, specifications and engineering data including: materials of construction, dimensions, weight and performance data.
 - b. Drawings showing the general arrangement of the weir and methods of installation with detailed mounting information.

B. Materials

1. General Information - FRP weir plates shall be 1/2" thick unless otherwise noted and constructed to the dimensions as per Contract Drawings.
2. Bolting hardware shall be locking type.
3. Bolting Hardware shall be type 316L stainless steel for all bolts, nuts and washers.
4. A neoprene side seal shall be placed on the sides of the weir plates. The neoprene side seal material shall be D2000 grade 2BC515.

C. Details of Construction

1. Weir plates shall be type I fabricated as defined in Section 1.1 of AWWA F102.
2. Weir plates shall be constructed with the following material:
 - a. Fibrous Glass: Materials used shall be continuous filament Type E (electrical borosilicate), glass with a chrome or silane finish and a styrene soluble binder compatible with the resin. Surfacing veil, if used, shall be 0.010 to .020

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inch thick Type C (chemical) or equivalent with silane finish and a styrene soluble binder on both sides.

3. Additives: Use thixotropic agents, mold release agents, promoters catalysts and low-shrink thermoplastic agents required for molding compounds used in the matched-die molding.
4. Plastic Resin:
 - a. Resin shall be a commercial-grade polyester thermosetting resin, which has either been evaluated in a laminate or which has been determined to be acceptable for the service conditions intended.
 - b. Resin shall contain no fillers or additives except as follows:
 1. A thixotropic agent, up to 5 percent by weight, which does not interfere with laminate quality or with the required chemical resistance of the laminate, may be added for viscosity control.
 2. Pigments, dyes or colorants used shall be light stable, not soluble in water and compatible with the resin. Color shall be selected by the Engineer.
 3. Ultraviolet Stabilization: Provide 0.25 percent by weight ultraviolet stabilizers in all laminates. The laminate shall exhibit not greater than 2 percent deterioration of flexural and tensile properties after 1000 hours of exposure in a Type E, single open-flame, sunshine carbon-arc lamp apparatus as detailed in ASTM G23.

D. Laminate Construction For Weir Plates

1. General: Produce fiberglass-reinforced plastic fabrications by the matched-die molding process to ensure smooth resin-rich surfaces and edges, dimensional accuracy and consistency. Mold weir plate notches within dies for increased corrosion and weather resistance. Sand and seal all cut edges with non air inhibited resin to ensure edges are completely sealed and to prevent water or chemical penetration of laminate. The laminate shall consist of exterior layer and an interior layer.
2. Exterior Layer: The exterior surface shall be free of cracks and

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crazing with a smooth finish. This surface shall consist of 0.01 to 0.02 inch of resin-rich layer reinforced with chopped strand glass. Other methods of surface protection shall be submitted to the Engineer for approval.

3. Interior Layer: The interior layer shall be constructed to provide the necessary physical properties. Where separate layers such as mat, cloth or woven roving are used, all layers shall be lapped a minimum of one inch. Laps shall be staggered. If woven roving or cloth is used, a layer of chopped strand glass shall be placed as alternate layers. A minimum of 0.1 inch of the laminate next to the exterior surface shall be reinforced with non-continuous glass strands having fiber lengths from 0.5 to 2.0 inches.

Laminate glass to resin ratio shall be 30 percent glass and 70 percent resin.

4. Cut Edges: All cut or machined edges shall be coated with resin with all voids filled and no glass fibers exposed.

5. Dimensions:

- a. Flat Crested Weir Edge; Weir plates shall be straight and vary not more than $\pm 1/8$ inch in 3 feet.
- b. Weir Plate Anchor Bolt Holes/Slots - Holes for wall mounting shall be dimensioned as shown on contract drawings. Variation in center-to-center dimensions between holes shall not exceed $\pm 1/8$ inch.

6. Finish and Appearance:

- a. The flat surfaces and edges of all weir plates, baffles, mounting brackets, closure plates and gates shall be free from porosity, voids and dry glass. Make surfaces and edges resin-rich to provide maximum resistance to corrosion and weathering.
- b. Fabrications containing porosity, voids, dry glass, delamination or defects not allowed in Table 1 of AWWA F102 may be rejected. Repair of defects to meet maximum allowable level of deviation specified in Table 1 of AWWA F102 will be permitted provided repair work is performed in a neat manner, is blended smooth and does not affect the serviceability of the fabrication. All such remedial work shall be subject to approval of Engineer.

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7. Minimum Physical Requirements: All laminates shall meet the minimum physical properties listed below:

Value of Property	Test Method	Property
Tensile Strength	ASTM D638	15 x 10 ³ psi
Flexural Strength	ASTM D790	25 x 10 ³ psi
Flexural Modulus	ASTM D790	0.8 x 10 ⁶ psi
Barcol Hardness	ASTM D2583	40
Izod Notched Impact	ASTM D256	13 ft-lb/in.
Water Absorption (24 hr @ 23°C)	ASTM D570	0.1% max.

E. Accessories

1. Provide all mounting brackets, anchor bolts, supports, stabilizing bars, angles or rods, fasteners and similar accessories required for installation of the equipment furnished. All metal accessories shall be Type 316 stainless steel.

F. Manufacturer

1. Plasti-Fab, Inc.
2. Warminster Fiberglass Company
3. Or equal.

G. Inspection

1. Contractor shall install all Work in complete accordance with the manufacturer's instructions and recommendations, and the approved Shop Drawings.
2. Contractor shall not install damaged items until repairs are made in accordance with manufacturer's written instructions and approval by Engineer. Only minor repair work will be permitted in the field. All damaged items requiring remedial work shall be returned to the manufacturer for repair or replacement.

H. Installation Of Weir Plates

1. Install all work in conformance with the approved Shop Drawings.

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2. Install at locations and elevations shown, unless otherwise approved by the Engineer.
3. Set all weir plates level within $\pm 1/16$ -inch over the entire weir length unless noted otherwise on the contract documents.

I. No Separate Payment

No separate payment shall be made for this work of the specification. All cost shall be included in the various Contract Items of this Contract.

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7.115

HOODS

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7.116

ALUMINUM SLIDE GATE

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7.117 GRAFFITI RESISTANT COATINGA. Description of Work

Under this Item, the Contractor shall furnish and apply Graffiti Resistant Coating to exterior stone, concrete, wood or other surfaces in accordance with OSHA guidelines, manufacturer's recommendations and the plans, specifications and directions of the Engineer.

B. General

The Contractor shall apply Graffiti Resistant Coatings as follows:

1. For previously painted masonry, concrete (vertical surfaces) and bethabara wood (both painted and unpainted), metal surfaces (both painted and unpainted), apply Graffiti Solution System (G.S.S.) manufactured by American Polymer Corporation, ARMAGLAZE, 9000 manufactured by Aquarius Coating, Inc., or approved equal
2. For new and unpainted masonry and concrete, the Contractor shall apply Professional Water Sealant & Anti-Graffiti, manufactured by Professional Products of Kansas, Inc., Blok-Guard & Graffiti Control Ultra manufactured by Prosoco, Inc., or approved equal.

C. Quality Assurance

Graffiti Resistant Coating shall be applied only by an approved installer per installation instructions who shall be trained by the manufacturer of each respective product and shall be certified by the manufacturers as qualified to install materials specified for this project. Only qualified Contractors or Subcontractors and their trades persons, meeting the above requirements shall be deemed approved. Submit a copy of current SSPC Certificate if applicable.

D. Product Delivery, Storage and Handling

1. The Contractor shall deliver materials in sufficient quantity to allow for continuity of work. Protect all materials and equipment during transit, delivery, storage and handling to prevent damage and deterioration.
2. Avoid fire; open flame and sparks. Container contents, even when empty, may ignite explosively when exposed to heat, welding, cutting torch, pilot lights and other flames and ignition sources at locations distant from the material storage and handling point.

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3. Avoid inhalation, ingestion, skin contact, and eye contact.
4. Protect shrubs, plants and grass during application. Avoid wind drift which may injure passersby or damage vehicles and adjacent properties.
5. For additional cautions, human health data and protective equipment to be used (including respiratory) refer to Material Safety Data Sheets.
6. Containers shall be kept closed when not in use.
7. Dispose of excess waste materials and empty containers in accordance with all local, state and federal regulations. Empty containers as may be classified as hazardous; they retain product residues such as vapor, liquid or solid. Do not transfer contents into other containers for storage.

E. Products

1. "G.S.S" Coatings. Note: This coating shall be applied to surfaces listed under "General" heading of this Specification (i.e. previously painted masonry, concrete and wood surfaces and metal surfaces both painted and unpainted).
 - a. G.S.S. Barrier Standard: Sealer product; standard undercoat - not high solids version. This Standard version shall be used with Clear overcoat. Barrier shall be applied over painted porous surfaces (not metal)¹
 - b. G.S.S. Barrier High Solids: Shall be used with Pigmented top coat. The high solids version is not recommended for use with clear top coating. High solids barrier consists of a one component, acrylic copolymer coating (see Manufacturer's Product Guide for more information).
 - c. G.S.S. 10 Clear Coating (Low VOC): Anti-graffiti product; overcoat G.S.S. 10 consists of a polymer composition; two (2) component resin and catalyst system. It is a non-sacrificial permanent coating with flat/matte finish. G.S.S. 10 Part A is premeasured to use for Part B.
 - d. G.S.S. Pigmented Coating: Anti-graffiti product; top coat. Two (2) component polyurethane, non-sacrificial, protective

¹For steel and aluminum surfaces, in lieu of G.S.S.-Barrier, use a water-borne urethane primer such as Bond-Plex, manufactured by Sherwin-Williams Company; or approved equal.

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coating. Color shall be selected from either the manufacturer's standard color guide or Sherwin-William Industrial and Marine Coatings, System 4000 color chart or approved equal. Finish shall be flat/matte (not gloss) unless otherwise noted. (pigmented coating shall be used in lieu of clear coating when previously painted substrate is not uniform in color and requires concealing with an opaque top coat.)

2. P.W.S. Coatings: Note: This coating shall be applied to surfaces listed under "General" heading above (i.e. new and unpainted masonry and unpainted concrete).

F. Execution

1. Surface Preparation

- a. Surfaces shall be thoroughly dry, cleaned and free of dust, surface dirt, oil, grease and other contaminants that might prevent penetration of the coatings. Newly constructed surfaces, repointed surfaces and concrete shall be cured for at least 28 days before application. Glossy, glazed and slick troweled surfaces should be lightly etched or abraded before application of coatings. Surface defects, voids, joints or cracks must be properly sealed or filled, allowing any patching compounds to be completely cured before application. Cleaning may be accomplished by high pressure washing, sand blasting or chemical cleaning. When chemicals are used, they should be removed by high pressure water cleaning before application of the sealant. Use of raw acids shall not be permitted. Allow cleaned surfaces to dry completely. A test must always be made prior to application using the same cleaning and application procedures as to be used on the project. This test area shall remain available to be inspected by the Engineer.

G. Application Procedures

1. General product application must not be initiated during inclement weather, or when precipitation appears imminent. Application should be completed at least four (4) hours before precipitation begins.
2. For the G.S.S. Type Coating Systems consisting of both undercoat and topcoat, refer to manufacturer's Application Guide along with information specified herein.

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- a. G.S.S. Barrier Undercoat sealer shall only be applied when temperature is between 50°F and 95°F. The surface to receive Barrier shall be visibly dry and relative humidity shall be such that condensation does not form on the surface during application.
- b. Apply two (2) coats of Standard Barrier Undercoat (3 to 4 mils total) over all previously painted masonry and wood surfaces using either brush, roller or spray. Ensure that the coatings are applied evenly and built up sufficiently to create a protective layer over the underlying surface and to eliminate any future "shadowing" or "ghosting" which would appear after the graffiti removal if the surface is not adequately sealed and coated. Barrier shall be applied creating a pinhole-free surface. Allow 1 to 2 hours between coatings. Avoid over-application of Barrier coating to avoid pooling or puddling which can result in permanent whitening. Application of Barrier in direct sunlight can also result in permanent whitening.
- c. G.S.S. 10 Overcoats shall be applied over G.S.S. Barrier undercoat. Prior to installation of overcoats, the barrier coats shall be allowed a minimum of 12 hours drying time. Moisture shall not be permitted on undercoating prior to application of G.S.S. 10 coating. G.S.S. 10 shall be activated by mixing parts A and B. These two portions have been premeasured at a precise ratio. The Contractor shall not mix at any other ratio and shall not add thinner or water. Part B shall be poured into Part A container. While mixing together, stir well with a lifting motion to ensure that the two parts are well balanced. If the coating must be thinned for application purposes, thin with MEK only and only after Parts A and B have been mixed together. The coating may be applied by brush, roller or spray. Apply two (2) coats of G.S.S. 10 of 1 to 2 mils thickness each coat. Allow one (1) to two (2) hours before applying the second coat. If using roller, direct the roller upwards from bottom toward top maintaining a wet wedge.
- d. Coverage rates will vary depending upon porosity of the surface and method of application. Once activated, the coating has a pot life of approximately 4 to 6 hours under normal conditions (80°F or less). The lid shall not be left off the container unnecessarily.

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H. For the Professional Water Sealant (P.W.S) Type Cleaning System, refer to Manufacturer's Application Guide along with information specified herein.

1. P.W.S shall be applied only when temperature is between 60°F and 80°F and relative humidity is 50%. Under these ideal weather conditions, the coating will dry to the touch in approximately twenty-five (25) minutes. At lower temperatures, drying time will be longer.
2. The coating shall be applied over all new and unpainted masonry, concrete and wood surfaces using a two (2) coat application process, with a drying time of not more than two and one-half (2-1/2) hours between applications.

Curing time will vary depending upon the temperature and humidity conditions. The second coat shall require six (6) to eight (8) hours to develop full graffiti protection.

3. On vertical applications, P.W.S. shall be applied with a low pressure airless sprayer at an angle to allow the sealant to run down the face rather than to penetrate deep into the voids of the substrate. On porous and rough stone surfaces, it shall be necessary to apply a mist coat before flood coating.
4. On horizontal surfaces, such as wooden bench slats, P.W.S. shall be applied by brooming, brushing, rolling or using airless spray equipment. The coating shall not be permitted to puddle or pond. Over-application may cause surface to become slippery when wet. Excess sealant shall be wiped up immediately.
5. For low pressure spray application, the setting shall be about 40 psi to avoid atomization of the material. Spray equipment shall be fitted with stainless steel or brass fittings and gaskets suitable for solvent solution. A fan spray tip of 50E with flow rate of approximately 4/10 of a gallon per minute is recommended. Coatings shall be applied in a saturating spray application from the top down. Apply sufficient material to create a six (6) inch to eight (8) inch rundown below the contact point. Allow the first application to penetrate the masonry surface until dry to the touch. If a second application is required, less material will be needed.
6. For brush application, brushes should be nylon or other synthetic material resistant to solvent solution. When applying Professional Water Sealant with a brush, apply sufficient material to thoroughly saturate the surface. Avoid excessive overlapping. Take care of

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brush out runs and drips, and to avoid buildup of Professional Water Sealant.

7. Container shall be kept tightly sealed until ready to use. Stir thoroughly before use. Product shall not be diluted or altered in any way. Coverage rates will vary depending upon surface porosity and texture. Once opened, Professional Water Sealant must be used within 24 hours.

I. Clean-Up Instructions

Clean application equipment immediately after each use. For G.S.S products, avoid having the G.S.S. 10 coating set up on or inside application equipment, by cleaning frequently with any of the following solvents (do not use solvents other than listed): xylene, lacquer thinner, MEK or n-butyl acetate. If coating has begun to set up and cannot be cleaned with the above, G.S.S. Erasol shall be used for cleaning. All drips and over spray shall be cleaned while still wet. For spraying equipment, cleaning with MEK every one (1) to two (2) hours is recommended. Since G.S.S 10 adheres permanently to surfaces, including human skin, spills shall be cleaned immediately. For P.W.S. products, clean equipment with mineral spirits or paint thinner.

J. Cure Time Required Prior To Remover Use

For G.S.S. products, full curing time required before graffiti can be removed from newly applied protective coating is seven (7) days at ambient temperatures. Curing period is longer during cooler temperatures. A test patch shall be performed during cooler temperatures to determine whether the G.S.S. 10 top coat has cured sufficiently to remove graffiti with Erasol Remover product. Apply a small amount of Erasol Remover product on a clean spot of the coated surface and let it stand for 24 hours undisturbed. When the coating appears to have softened, it has not fully cured. When the coating remains hard, then Erasol may be used to remove graffiti.

K. Graffiti Removal

1. For permissible materials to be used in removing any graffiti which may accumulate during construction contract duration, the Contractor shall refer to listing found under Section 7.116.12 (Extra Materials).
2. For graffiti removal procedures, see manufacturer's literature and instructions. Use of chemicals which are not included in manufacturer's list of components for remover system may damage

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or remove the protective coating, thereby necessitating the reapplication of sealant/coating systems.

3. Use of remover products which are not part of the complete system (i.e. not manufactured by the same companies as protective coatings) will void the 10 year manufacturer's warranties/guarantees.

L. Submittals

1. The Contractor shall submit manufacturer's technical data sheets, vapor transmission testing results and applicable OSHA regulations for storage, handling and application of both the Graffiti Resistant Coatings and Graffiti Remover products to the Engineer for approval.
2. The Contractor shall submit manufacturer's product guarantee/warranty for a period of ten (10) years from the date of purchase, stating that the coatings will allow for the removal of all types of paint and other graffiti materials when same manufacturer's removal product has been used subject to listing of manufacturer's limitations which shall be included with the submittal. Manufacturer and/or its Certified Applicator shall remove the graffiti and recoat the surface at their own expense. The G.C. Contractor shall provide, sealed in plastic, a statement of the warranty with the name, telephone number and address of the manufacturer of the product to be contacted in the event that product fails. G.C. shall forward one (1) copy of the warranty to the following at the time of final acceptance:

DEP Staten Island Bluebelt Field Office
182 Joline Avenue
Staten Island, New York 10307
718-984-0489
718-984-4430 (fax)

3. The Contractor shall submit written certification from the respective manufacturers of coatings, certifying that installers have been properly trained and are currently approved by the manufacturers to install the specified graffiti resistant coatings. Provide copy of certification to the Engineer prior to start of Contract work.

M. Measurement and Payment

The quantity of graffiti resistant coating to be paid for under this Item shall be the number of square feet of surfaces prepared, coated and cured in

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accordance with the Contract Drawings, Specifications and directions of the Engineer. The price bid shall be a unit price per square foot as indicated on the BID SCHEDULE OF PRICES, Item No. BMP-7.117. The bid price shall include the cost of all labor, materials, equipment and incidental expenses necessary to complete the work of furnishing and installing graffiti resistant coatings including surface preparation, application and proper curing of coating and maintenance of surfaces coated throughout contract duration, all in accordance with the plans, specifications and to the satisfaction of the Engineer.

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7.118A

BEEHIVE GRATES

NO TEXT ON THIS PAGE

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7.119

LADDERS

NO TEXT ON THIS PAGE

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7.120 TRASH RACKA. Work Included

1. Description. The Contractor shall furnish and install trash rack as shown on the Contract Drawings.

The work shall include all labor and materials necessary to furnish, paint, deliver, install and test the equipment.

2. General Requirements.

- a. General Specifications. Except as modified by the Detailed Specifications, the work performed under this section shall conform to the requirements of the latest NYCDDC Standard Sewer Specifications
- b. As-Built Conditions - The Contractor shall perform an as-built survey to verify all pertinent dimensions prior to fabrication of the bar rack and the Contractor shall have full responsibility for the proper fit of the furnished bar rack sections at the location designated on the Contract Drawings.
- c. Shop Drawing. The Contractor shall submit to the Engineer for approval shop drawings and other material required to substantiate conformance with the requirements set forth on the Contract Drawings. Shop drawings shall include dimensional drawings including detailed sections of structural steel and equipment, complete identification and material specifications.

B. No Separate Payment

No separate payment shall be made for this work of the specification. All costs shall be included in the various Contract Items of this Contract.

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7.121

MANHOLES, CHAMBERS & CATCHBASINS

NO TEXT ON THIS PAGE

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7.122

MANHOLE STEPS

NO TEXT ON THIS PAGE

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7.123 ASPHALT PAVING FOR PATH

NO TEXT ON THIS PAGE

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7.124

TIMBER STOP LOG

NO TEXT ON THIS PAGE

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7.125

ACCESS HATCHES

NO TEXT ON THIS PAGE

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7.126

GRANITE CASCADES

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7.127

TEMPORARY ASPHALT PAVEMENT

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7.128

ASPHALT PAVING

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7.129 CONCRETE STRUCTURESA. Work Included

The Contractor shall investigate, install, test and place in satisfactory operation all Concrete Structures as shown on the Contract Drawings and specified herein. Concrete Structures include but are not limited to headwalls, retaining walls, perimeter walls, weir walls, hydraulic flow splitters, hydraulic riser boxes, culverts, sewers, chambers, catch basins, manholes, sand filters, pedestrian bridges and stone piers.

B. General Requirements

1. General Specifications-The General Specification: 11-Concrete (Dated November 1991) of the Department of Environmental Protection (DEP) is declared to be part of this specification, the same as it fully set forth elsewhere herein. Copies of this specification may be obtained from the Department. Concrete work shall conform to all requirements of that specification except as modified by the applicable sections of this Detailed Specification.

2. Refer to Sect 7.103.C: Detail Requirements as contained within this contract specification.

3. Geotechnical Investigation

A geotechnical investigation shall be performed by the contractor prior to construction. The geotechnical investigation shall include borings and a geotechnical report. Borings shall be located as shown, driven to a minimum depth of 35 feet or refusal with continuous sampling. The geotechnical report shall include boring logs, soil testing results, bearing capacity and bearing elevation, soil properties, recommendations on foundation type and subgrade preparation recommendations. Scour shall be considered in the foundation recommendations. The geotechnical report shall be signed and sealed by an Engineer licensed in the state of New York. The geotechnical report shall be submitted by the Contractor to the Engineer. The Contractor may be required to revise the design in order to comply with the recommendations made by the Geotechnical Engineer. All modifications are to be submitted to the Engineer for review.

4. Submittals

The Contract shall submit to the Engineer for approval shop drawings and other materials required to substantiate conformance

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to the requirements set forth on the Contract Drawings and the Specifications in accordance with the Standard Sewer Specifications. Submittals shall also include all material required under the "Submittals" section of the chapters of General Specification 11, Concrete, and any additional submittals hereinafter specified.

C. Measurement and Payment

The quantity to be measured for payment under this Section shall be the total number of Concrete Structures installed as directed by the Engineer.

The Contract price for each Concrete Structures shall be as indicated on the Bid Schedule of Prices Item No. BMP-7.129-1 to BMP-7.129-8. The bid price shall include all work and equipment necessary to complete this item in accordance with the plans and specifications and to the satisfaction of the Engineer. The Concrete Structures unit price shall include but not be limited to geotechnical investigation, concrete, reinforcement, excavation, backfilling, crushed stone, geotextile, sheeting and bracing, stone facing, hatches, manhole covers, grating, railings, piping, hoods, valves, weir plates, ladders, steps, trash racks and bronze plaque. The unit price shall also include removal of all existing structure and debris found at the proposed new structure location.

D. Concrete Structures Summary

<u>Item</u>	<u>Description</u>
BMP-7.129-1	Structure No. 1 - NC-7 Weir
BMP-7.129-2	Structure No. 2 - NC-9 Weir
BMP-7.129-3	Structure No. 3 - NC-7 Kiswick St. Headwall
BMP-7.129-4	Structure No. 4 - NC-7 Nugent Ave. Headwall
BMP-7.129-5	Structure No. 5 - NC-8 Freeborn St. Headwall
BMP-7.129-6	Structure No. 6 - NC-8 Olympia Blvd. Headwall
BMP-7.129-7	Structure No. 7 - NC-9 Olympia Blvd. Headwall
BMP-7.129-8	Structure No. 8 - NC-17 Graham Blvd. Headwall

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7.130

BOAT CLEATS

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7.131

GRANITE PAVING STONES

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7.132

PEDESTRIAN BRIDGE

NO TEXT ON THIS PAGE

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7.133

CHECK VALVE

A.

Description of Work

1. The Contractor shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install the elastomeric inline check valve complete and operational with clamp and accessories.

B.

Materials

1. Inline check valves shall be "CheckMate", manufactured by Tideflex Technologies; "ProFlex", manufactured by PROCO; "Flex-Valve", manufactured by General Rubber; or approved equal.
2. The check valve shall be all rubber and the flow operated check type with slip-in cuff connection. The valve shall be sized for a 12-inch diameter ductile iron pipe unless otherwise stated on the construction drawings.
3. The entire check valve shall be reinforced throughout the body, disc and bill, which is cured and vulcanized into a one-piece unibody construction. A separate valve body or pipe used as the housing is not acceptable.
4. The valve shall be manufactured with no metal, mechanical hinges or fasteners, which would be used to secure the disc or bill to the valve housing. The port area of the disc shall contour down, which shall allow passage of flow in one direction while preventing reverse flow. The entire valve shall fit within the pipe inner diameter and, once installed, shall not protrude beyond the face of the structure or end of the pipe.
5. The downstream end of the valve must be circumferentially in contact with the pipe while in the closed position.
6. The valve shall be furnished with a set of stainless steel expansion clamps. The clamps, which will secure the valve in place, shall be installed inside the cuff portion of the valve, based on installation orientation, and shall expand outwards by means of a turnbuckle. Each clamp shall be pre-drilled allowing for the valve to be pinned and secured into position in accordance with the manufacturer's installation instructions.

C.

Shop Drawings - The Contractor shall submit to the Engineer for approval shop drawings and other material required in accordance with the

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requirements set forth on the Contract Drawings and the Specifications. Shop drawings include, but are not limited to:

1. Manufacturer's literature, illustrations, specifications and engineering data including:
 - a. Check valve hydraulic testing data for headloss, jet velocity, and vertical opening height characteristics. Testing must be conducted for free discharge (discharge to atmosphere) and submerged conditions.
 - b. Flow test data from an accredited hydraulics laboratory to confirm pressure drop and hydraulic data. Company name, plant location, valve size patent number, and serial number shall be bonded to the check valve.
2. Drawings identifying valve materials of construction and dimensions.

D. Measurement and Payment

The quantity to be measured for payment under this Section shall be the total number of check valves installed as directed by the Engineer.

The contract price shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.133. The bid price shall constitute full compensation for all labor, materials, equipment and work incidental thereto, necessary to furnish, place and incorporate and all other work incidental thereto, in accordance with the plans and specifications to the satisfaction of the Engineer.

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MORTARED STONE WALL

7.201 WORK INCLUDED

Under this item, the Contractor shall furnish all labor, materials and equipment for completing the construction of mortared stone wall as specified herein and as shown on the Contract Drawings, including all incidental and appurtenant work required for a complete job.

The work shall include items of work specified under the following sections:

<u>Section Number</u>	<u>Title</u>
7.201	Work Included
7.202	Masonry Mortar
7.203	Masonry Accessories
7.204	PA Colonial Field Stone

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7.202

MASONRY MORTAR

A.

Description of Work

1. Description. Furnish all labor and material necessary for the preparation and placing of all mortar for masonry and stone work.
2. General Requirements.
 - a. General Specifications. Masonry mortar and grout materials shall comply with the requirements of this Section, except where otherwise shown or specified. Where no description has been specified for any material required, the current Reference Standard RS 10-1, Masonry - City of New York Building Code, shall apply. Concrete materials shall conform to the requirements of General Specification 11 - Concrete.
 - b. Code. The use of masonry cement mortar, as approved by the Board of Standards and Appeals, is optional. Masonry cement mortar shall fulfill the requirements of the Administrative Code of the City of NY and it shall be a mix of one part cementitious material to two-and-three-fourths parts of sand by volume. It shall be furnished in sacks containing one cubic foot each, and shall be marked with the weight.
 - c. Test. Masonry mortar samples shall be provided by the Contractor upon request from the Engineer. Samples will be subject to tests in conformance with ASTM C270.
 - d. Job mock-up. Sample panels will be constructed at the site. At that time, adjust mortar samples to achieve desired colors at the discretion of the Engineer.

B.

Materials

1. Cement. Unless otherwise qualified, the term "portland cement" whenever used in connection with masonry work shall conform to the requirements of General Specification 11 - Concrete. Masonry cement shall fulfill the requirements of ASTM C91.
2. White Portland Cement. White portland cement shall be approved domestic product containing no ingredient that will stain other materials with which the cement comes in contact. It shall not

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contain more than 0.03% by weight of soluble alkali and shall fulfill the requirements of ASTM C150.

3. Lime Putty. Lime putty shall be made from hydrated lime except that quicklime may be used when adequate time and facilities are available for aging. Suitable precautions shall be taken to protect the putty from exposure to the sun and to prevent excessive evaporation when stored.
 - a. Hydrated lime shall be mixed with the amount of water called for in the printed directions of the manufacturer to form a putty and shall be allowed to stand for at least 24 hours before using. The hydrated lime may be sifted into the water, or the putty may be screened or punched through a sieve, or treated in any other manner, so as to obtain a smooth lump-free putty. Hydrated lime shall fulfill the requirements of ASTM C6.
 - b. Quicklime (pulverized) shall be slaked in suitable large batches, with the amount of water called for in the printed directions of the manufacturer, to form a thick cream. Lime shall be sifted into water. During cool or cold weather, precautions shall be taken to maintain the heat and prevent premature cooling during the process of hydration. The slaked quicklime shall be passed through a No. 10 sieve and stored for at least 72 hours before using. When the use of lump quicklime, slaked on the job, in lieu of pulverized quicklime is specifically approved for plastering, the cooling and aging period shall be not less than 14 days. Quicklime shall fulfill the requirements of ASTM C5.
 - c. Pressure hydrated lime shall be used as recommended by the manufacturer and shall conform to the requirements of ASTM C206.
4. Fine Aggregate. Sand shall conform to all the physical and chemical requirements and fulfill all the test requirements of NY Specification 24-S-30 for types as herein specified.

Fine aggregate for thin joints for units with cut or ground edges shall be Class A Type 2A but with not less than 95% passing thru No. 16 sieve.

Fine aggregate for masonry work in general, glass block and plaster shall be Class A Type 2A. For joints which are 1/2" wide or more, Type 2A shall be used.

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White sand shall be pure silica sand or marble dust having a gradation approximately within the limits specified for thin joints.

Sand in setting bed mortar for tile shall be as described for masonry work, except that not more than 5% shall pass thru a No. 100 mesh sieve.

Fine aggregate for pointing mortar tile (ceramic and quarry) shall be as specified for masonry work, except that 100% shall pass thru a No. 30 mesh sieve with no more through than 5% passing through a No. 100 mesh sieve.

Before the start of work, sample of fine aggregate shall be submitted to the Engineer for approval.

5. Water. Water used in connection with masonry work shall be clean and free of injurious amounts of oil, acid, alkali, organic matter or other deleterious substances, or shall be the water used in the City for drinking purposes.
6. Waterproofing and Non-Shrink Admixtures. An approved waterproofing plasticizer with pozzolanic properties containing pure stearic acid and equal to "Omicron" by Master Builders, or "Hydrocide" powder by Sonneborn Building Products Division of Contech, Inc., shall be added to produce a non-shrinking waterproof mortar. Admixture will be mixed with mortar as per manufacturer's requirements or if manufacturer does not specify in a 15:1 volumetric ratio of mortar to admixture.
7. Grout. Grout shall be mixed to a thick consistency. Neat grout shall be composed of cement and water only. Non-staining cement shall be used for non-staining grout.

C. Mixes

1. General Specifications. The mortar mixtures shall conform to ASTM C270. The proportions of cement specified herein are the minimum.
2. Type M Mortar. ASTM C270; composed by volume in proportions of 1/2 part portland cement, 1 part masonry cement and not more than 4 parts sand, measured in a damp, loose condition, with waterproofing added, with a minimum average compressive strength at 28 days of 2,500 psi. Use Type III mortar for all masonry work which is below grade.

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3. Mixing. Mortar shall be freshly mixed and the quantity of each batch shall not be in excess of the amount that will be used before the same has started to set. Retempering will not be permitted. The ingredients for each batch shall be accurately measured and combined in the proportions specified, all parts being measured by volume. Mortar shall be mixed in a batch mixer or by hand and shall be of uniform color and consistency. Mixer drums shall be entirely emptied of a batch before charging for a succeeding batch is started. The mixing time shall be not less than 5 minutes, approximately 2 minutes of which shall be for mixing the dry materials and not less than 3 minutes for continuing the mixing after the water has been added.
4. Coloring. Mortar shall be colored using cement during the mixture process. After mixing, mortar shall be of uniform color.

D. Measurement and Payment

No separate payment shall be made for this work of the specification. All costs shall be included in the various Contract Items of this Contract.

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7.203 MASONRY ACCESSORIESA. Description of Work

1. The Contractor shall provide all labor, materials and equipment necessary to place all masonry accessories as specified and shown on the Contract Drawings.
2. General Requirements.
 - a. Samples. Submit three of each item to the Engineer as specified in the General Conditions.
 - b. Job Mock-Up. A sample panel will be constructed at the site. At that time furnish all anchors, ties and reinforcement necessary to construct the sample panel.
 - c. Manufacturer.
 - 1) Acceptable manufacturers of anchors, ties and accessories: Hohmann and Barnard, Inc., Hickman Building Products, Inc., or approved equal.
 - 2) Acceptable manufacturers of joint reinforcement: Dur-O-Wall, Inc., AA Wire Products or approved equal.
3. Product Delivery, Storage and Handling. Materials shall be stored under cover in a dry place and protected from the elements.

B. Materials

1. Anchors and Ties for Exterior and Interior Work . Non-corrosive, stainless steel.
 - a. Corrugated or Crimped Ties. 22 gauge, not less than 7/8-inch wide, not less than 5 inches long.
 - b. Dovetail Type Masonry Anchors for Fastening Stone to Slot Inserts in Concrete. Shall be designed to fit the slots, not less than 16 gauge, 7/8-inch wide, turned up 1/4-inch at the end. Dovetail slots shall be 20 gauge filled type, furnished under this Section and installed under General Specifications 11, Concrete.

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C. Installation

1. Clean off foreign coatings that will destroy or reduce the bond immediately before placing reinforcing anchors and ties.
2. Provide all anchors, anchor slots, ties, masonry joint reinforcement and other anchorage devices necessary to anchor masonry work to the structure and to other masonry.
3. Coordinate placement of vertical slots 16-inch o.c. for anchorage of masonry furring and facings in front of concrete. Continuous slots shall not be placed closer than 3 inches to the edges of concrete work.

D. Measurement and Payment

No separate payment shall be made for the Masonry Accessories construction of Concrete Structures. All costs shall be included in the unit cost of the Concrete Structures item, specification section 7.129.

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7.204 PA COLONIAL FIELD STONEA. Description of Work

The Contractor shall furnish all labor, materials, equipment and services necessary to install stone facing as specified herein and as shown on the Contract Drawings.

B. General Requirements.

1. Samples. Furnish sufficient stone units including special shapes required, to show range of colors, texture, finishes and dimensions.
2. Job Mock-Ups.
 - a. Construct two 4 ft.-0 in. x 6 ft.-0 in. sample panels of stone units, with at least one 90E corner, and coping. Show backup and reinforcement.
 - b. The Contractor shall construct the three types of sample panel as often as required by the Engineer to achieve approved samples. Do not proceed with construction until sample panels are accepted by the Engineer.
 - c. Retain accepted samples as reference standard for project.
 - d. Demolish and remove sample panels from the site after completion and acceptance of all masonry work.
3. Store all stone units above ground on level platforms which allow air circulation under stacked units; cover and protect against wetting prior to use.
4. Handle units on pallets of flat bed barrows and do not permit free discharge from conveyor units or transporting in mortar trays.
5. Do not place concrete masonry units, when air temperature is below 40° F (4° C) without specific instructions in writing from the Engineer.

C. Stone Facing Work1. Materials

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- a. Stones: All stones shall be quartzite sandstone, commonly known as Pennsylvania Colonial Field Stone or natural local stone as approved by the Engineer.

All stones shall generally have a minimum length of one (1) foot six (6) inches and a minimum height of six (6) inches. All stones shall generally have a maximum length of three (3) feet zero (0) inches and a maximum height of twelve (12) inches. Stone widths shall generally be no more than twelve (12) inches, and shall generally conform to the width of the stone ledge provided.

All stones shall be free of soil and debris in order to achieve a secure bond with the mortar.

D. Installation

1. Lay stone with not less than 1" nor more than 2" of the specified mortar between stone and the back-up wall, and in accordance with the approved mock-up.
2. Joints shall have a nominal thickness of 3/8-inch, and uniform.
 - a. Strike joints flush in surfaces not exposed to view.
 - b. Point joints tight in unpared masonry below ground, or water level.
 - c. Tool joints in exposed surface when thumb-print hard with round jointer.
3. Contractor shall field verify condition of existing structures and surfaces as per ACI guidelines 201.1R prior to laying of stone.
4. Laying
 - a. Lay only dry units. Stones shall be laid in cement mortar so as to form full bed, end and side joints at one operation. Stones shall be laid with flat side down and best side facing outward. Those stones with best face on all sides shall be used for the top course as wall cap.
 - b. Stones shall be tightly wedged together and flash point mortared in place.

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- c. Provide full mortar coverage on horizontal and vertical face shells. Provide full mortar coverage also on webs, in all starting courses, in piers, columns and pilasters, and adjacent to cells or cavities to be filled with grout.
- d. Shove vertical joints tight.
- e. All stones shall be laid in a horizontal banding pattern, utilizing the one-over-two and two-over-one method. Set units plumb, true and line, and with level courses accurately spaced. Adjust units to final position while mortar is soft and plastic.
- f. Keep open spaces at control joints and expansion joints free of mortar by using a continuous wood or metal strip temporarily set in the wall.
- g. If units are displaced after mortar has stiffened, remove, clean joints and units of mortar, and relay with fresh mortar.
- h. When jointing fresh mortar to set or partially set stone construction clean exposed surface to set masonry and remove loose mortar prior to laying fresh masonry. If necessary to stop off a horizontal run of masonry, rake back one-half block length in each course. Do not use toothing to join new masonry to set or partially set masonry when continuing a horizontal run.

5. Anchors and Reinforcement

- a. Units at corners and at intersections shall be bonded with masonry bond and preformed joint reinforcement spaced vertically 16-inch o.c.
- b. Where block passes concrete, anchor with one dovetail anchor for each 2 square feet of wall surface.

6. Built-In Work

- a. Avoid cutting and patching.
- b. Install bolts, anchors, nailing blocks, inserts, frames, vents, flashings, conduit and other built-in items as masonry work progresses. Solidly grout spaces around built-in items.

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- c. Coordinate the work of this Section with work of all other trades so that no requirements are overlooked.

7. Protection of Work

- a. Protect sills, ledges and off-sets from mortar drippings or other damage and remove misplaced mortar or grout immediately.
- b. Cover top of walls with non-staining waterproof coverings when work is not in progress. Provide minimum 2 ft. overhang of protective covering each side of wall and securely anchor.
- c. Protect face materials against staining.

8. Pointing and Cleaning

- a. At final completion of unit masonry work fill holes in joints and tool the same.
- b. Cut out and repoint defective joints.
- c. Dry brush masonry surface after mortar has set, at end of each day's work and after final pointing.
- d. Leave work and surrounding surfaces clean and free of mortar spots and droppings.
- e. Wash down all exposed brick with an approved masonry-type detergent, and then thoroughly rinse with clean water. Before applying any cleaning agent to the entire wall, apply it to a sample wall in a location approved by the Engineer. Cleaning shall not proceed until the sample area has been approved by the Engineer after which the same materials and methods shall be used on the entire work. Acid solutions or acid-type detergents shall not be used.

E. Measurement and Payment

The quantity to be measured for payment under this Section shall be the total number of cubic yards of PA Colonial Field Stones and mortar furnished in accordance with the plans and specifications and directions of the Engineer. The contract price per cubic yards of approved PA Colonial Field Stones shall be as indicated on the BID SCHEDULE OF PRICES Item

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No. BMP 7.204. The bid prices shall be a unit price per cubic yards of PA Colonial Field Stones furnished.

No separate payment shall be made for PA Colonial Field Stones furnished and installed as facing on Concrete Structures. All costs shall be included in the unit cost of the Concrete Structures item, specification section 7.129.

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EARTHWORK AND GRADING

7.300 Work Included

Under earthwork and grading, the Contractor shall provide all labor, material, tools and equipment necessary to complete the execution of the work in complete accordance with the Specifications and all Contract Drawings. The work shall include items of work specified under the following sections.

<u>Section Number</u>	<u>Title</u>
7.301	Debris Removal and Disposal
7.302	Clearing, Grubbing and Removals
7.303	Temporary Wood Tree Guards
7.304	Excavation
7.305	Crushed Stone
7.306	Tree Removal and Disposal
7.307A	Grading
7.308	Fill On-Site
7.310	Plant and Sod Salvage
7.312	Demolition and Site Clearing
7.317	Soil Sampling and Disposal

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7.301 DEBRIS REMOVAL AND DISPOSALA. Description of Work

Under this item, the Contractor shall remove all debris and objectionable material in the work areas. Debris such as household, yard wastes and construction fill, fencing, abandoned structures, stones, wood as well as construction debris and any other objectionable debris shall be removed from the specific areas within the limits of the Contract, in accordance with the plans and specifications as directed by the Engineer. Removal of fallen trees which are resting on the ground shall be included in this item. The removal and disposal off-site of the following items shall be included in this Item: abandoned vehicles, large appliances, tires, auto engines, other auto debris, scrap pieces of metal, plastic, wood, asphalt and concrete rubble, other dumped fill, household waste and yard waste. This work is to be done before installation of guide rail and/or landscaping activities and other pertinent work of this Contract.

Stones deemed suitable for reuse shall be stockpiled on-site at a location determined by the Engineer. Stones deemed not useful for contract purposes shall be removed by the Contractor from the site.

The Contractor shall carefully protect all trees, shrubs and other growth to remain, and shall be liable for any and all damages to property caused by Debris Removal operations. All trees, plants, and constructed features damaged during Debris Removal shall be replaced or restored to their original condition to the satisfaction of the Engineer.

This item shall apply only to those areas not covered by the item, Clearing, Grubbing and Removals. All debris removal in areas covered by Clearing, Grubbing and Removals shall be paid for under the unit price bid for Clearing, Grubbing and Removals.

B. Construction Methods and General Removal Protocol

All removal of debris from wooded areas, marshes, ponds and stream beds shall be performed by hand, except those areas that can be reached by machines located on paved roads or hard-packed open surfaces. Debris shall be removed to the nearest street edge for removal by the Contractor.

In sensitive natural areas, the removal of debris may cause more damage to the landscape than the benefits derived from the clean-up. Therefore, for debris that is inaccessible from a hard surface, the Contractor shall consult with the Engineer to decide if it shall be removed. Engineer will inform the

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Contractor of any debris items not to be removed due to inaccessibility and anticipated damage to soils and vegetation.

Every effort to protect overhanging branches from damage by machines shall be taken. No plant material shall be removed except as ordered by the Engineer.

1. Where accessible from paved road or existing packed dirt road, use front-end loader and/or backhoe to remove items to nearest street. Heavy machinery must remain on paved/hardened surfaces.
2. With the consent of Engineer, remove debris from wooded, field, or marsh areas by hand. Use existing trails where possible. For marsh areas, choose an entry point that minimizes the impact on vegetation. Blow torches, hand tools, and wheel barrows can be used to disassemble and remove large items. In order to minimize leakage from vehicles, separately remove and dispose of fluid-containing car parts.
3. With the consent of Engineer, remove items in open water by hand, unless of large enough size to warrant the use of a winch. In both cases, choose an entry point that will have the least impact on the shoreline, considering both the edge vegetation and bank stability. If using a winch, attach chains to the object and pull to shore. The vehicle housing the winch must remain on a paved or hardened surface. Once on shore, remove the debris according to the land conditions (i.e. by hand or with heavy equipment).

C. Measurement and Payment

The quantity to be measured for payment shall be as described herein. The quantity shall be for debris removal within the specified Work Areas.

Measurement shall be made in containers and/or vehicles, and the quantity to be paid for will be eight-tenths (8/10) of the yardage determined by such measurements.

The price bid shall be unit price per cubic yard for debris removal and disposal as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.301. The bid price shall constitute full compensation for all materials, labor, equipment, and work incidental thereto, necessary to complete this item in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.302 CLEARING, GRUBBING AND REMOVALSA. Description of Work

Under this item, the Contractor shall clear, grub and remove all objectionable material such as trees (with calipers 6 inches or less), shrubby growth and brush, vines, stumps of all sizes, roots and weeds, within the limits of the BMP project site, in accordance with the plans and specifications as directed by the Engineer.

Trees with calipers 6 inches or less shall be removed under this item. Trees with calipers over 6 inches shall be removed under the Tree Removal item.

No trees or shrubs shall be removed except as ordered by the Engineer. All cleared and grubbed material shall be removed from the sites of the Contract and properly disposed of by the Contractor. No additional payment will be made for this, but the cost thereof shall be deemed included in the price bid for this item.

Every effort to protect overhanging branches from damage by machines shall be taken.

The Contractor shall carefully protect all trees, shrubs, and other growth which are to remain, and shall be liable for any and all damages to property caused by clearing and grubbing operations. All trees, plants and other property to remain which are damaged shall be replaced or restored to their original condition to the satisfaction of the Engineer, at no additional cost to the City.

The Contractor shall not remove stones from the site unless otherwise directed by the Engineer. Where stones are found to be in locations conflicting with areas to receive work, stones shall be relocated and stockpiled to adjacent on-site areas. The contractor shall retain and stockpile boulders on site for use in BMP construction as directed by Engineer.

B. Construction Methods and General Removal Protocol

Unless otherwise directed, the Contractor shall clear, grub and remove only objectionable surface and subsurface material heretofore described to a depth of six (6) inches below the ground surface as directed by the Engineer. If such areas are in fill greater than six (6) inches, trees and shrubs may be cut flush with the ground surface.

C. Measurement and Payment

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The quantity to be measured for payment under this section shall be the total number of square feet successfully cleared and grubbed and all objectionable material removed in accordance with the plans and specifications and directions of the Engineer. The quantity shall be for clearing, grubbing and removal of all objectionable material within the project work limits.

For supplying all labor, materials and equipment necessary for clearing, grubbing and removals, the Contractor shall receive a unit price bid.

The Contract price per square foot for Clearing, Grubbing and Removals shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.302. The bid price shall constitute full compensation for all labor, materials, equipment and work incidental thereto, necessary to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer.

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DIVISION VII - DETAILED SPECIFICATIONS -
CONTRACT MIBBNC0017.303 TEMPORARY WOODEN TREE GUARDSA. Description of Work

Under this Section, before the commencement of any contract site work, the Contractor shall furnish and erect temporary wooden tree guards around existing trees to be safeguarded from construction activities in accordance with the plans, specifications and directions of the Engineer. For Temporary Wooden Tree Guard detail, refer to Contract Drawings. In order to avoid surface and subsurface root damage and soil compaction, the Contractor shall not be permitted to stockpile materials of any nature within the drip lines of trees to remain. Tree protection shall include securely tying up branches to prevent mechanical injury if deemed necessary by the Engineer. All equipment used on site shall be appropriate to the scale of the project. "Appropriate-sized" equipment shall be described as only equipment which can operate effectively on site without causing damage to existing vegetation.

B. Materials

Lumber to be used for temporary wooden tree guards shall be unpainted Yellow Pine, Douglas Fir or Spruce. All nails shall be hot-dipped galvanized steel.

C. Method

Unless otherwise directed, the Contractor shall install the temporary tree guards as shown on the drawings without causing damage to the existing trees to be protected. If any temporary wooden tree guards are destroyed or sustain damage during the course of the work, they shall be immediately repaired, or replaced by a new temporary wooden tree guard at no additional expense to the City.

Temporary wooden tree guards shall remain in place until all work which might cause damage or defacement to protected trees has been completed. Upon the completion of work to the satisfaction of the Engineer, the Contractor shall remove and dispose of all temporary tree guards from existing trees. All work shall be done in a careful, neat, and workmanlike manner.

If any trees are removed from a work site in violation of the plans and specifications (specifically the tree removal authorization issued by the City Planning Commission under the Special South Richmond Development District regulations of the Zoning Resolution of the City of New York), the Contractor shall be held responsible. Such trees shall be replaced without any extra expense to the City.

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D. **No Separate Payment**

The cost for all labor, materials and equipment required for the temporary wooden guards shall be deemed included in the price bid under DETAILED SPECIFICATIONS FOR CLEARING, GRUBBING AND REMOVALS. No separate payment shall be made for temporary wooden tree guards.

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CONTRACT MIBBNC0017.304 EXCAVATIONA. Description of Work

The Contractor shall furnish all labor, materials, equipment and services necessary to perform all excavation as indicated on the Contract Drawings and as specified herein.

B. General Requirements

1. General Specifications - Except as modified and supplemented hereinafter in the Detailed Specifications, work performed under this Section shall conform to the NYCDEP Standard Sewer Specifications.
2. Shop Drawings - The Contractor shall submit to the Engineer for approval shop drawings and other documentation required to show conformance with the requirements set forth on the Contract Drawings and these Specifications. Shop drawings shall include, but not be limited to, the requirements for shop drawings as specified in Standard Sewer Specifications.

C. Excavation

1. General Information - 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 NYCDEP Standard Sewer Specifications, except as otherwise specified herein. Excavation shall include removing boulders of size less than one-half cubic yard. Excavation shall also include the removal of existing buried pipelines, the plugging of those remaining sections of the pipelines and the plugging of all existing buried pipelines to be abandoned but not removed.

The limits of excavation shown on the drawings are the payline and 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 performing the excavation to the levels and surfaces indicated.

2. Excavated Materials - The Contractor shall dispose off site all excess and unsuitable materials. Boulders and stones deemed suitable for reuse shall be stockpiled on-site at a location determined by the Engineer.

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3. Hazardous and Non-Hazardous Waste – Prior to starting the work, the contractor shall perform soil sampling as detailed in Section 7.317-Soil Sampling and Disposal. Sampling and subsequent removal of contaminated soils shall be paid for under that item.
4. Care of Water - Prior to starting the work, the Contractor shall submit to the Engineer for approval, a detailed description of the method he proposes to use to care for water during construction, including a coordinated sequence of operation for the entire project. Approval by the Engineer will not relieve the Contractor of his responsibility for the safety of the work, existing structures and adjacent property.
5. Stockpiling - Topsoil that has been excavated and approved for use on-site is to be stockpiled separate from subsoil. Topsoil shall be excavated to a depth of 18" or as directed by the Engineer. Location of stockpiling shall be approved by the site Engineer. If the Engineer deems necessary, subsoils shall be separated and stockpiled according to soil horizons.

D. Measurement and Payment

The quantity to be measured for payment under the pay item Excavation shall be the total number of cubic yards, measured in containers and vehicles, and the quantity to be paid for will be 75% of the yardage determined by such measurements.

The contract price per cubic yard of material excavated and disposed of off-site shall be indicated on the BID SCHEDULE OF PRICES Items No. BMP-7.304A. The bid price shall constitute full compensation for all labor, materials, equipment and work incidental thereto, necessary to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer.

All costs for removal of contaminated soils will be included under the unit bid price for Soil Sampling and Disposal Section 7.317.

All costs for excavation performed in conjunction with the construction and installation of concrete structures will be included under the unit bid price for Concrete Structures Section 7.129.

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7.305 CRUSHED STONE

A. Description of Work

The Contractor shall provide and install Crushed Stone bedding as indicated on the Contract Drawings and as specified herein.

B. Materials

Crushed stone used shall conform to the following gradation and shall be compacted to 98 percent density as determined by ASTM D698.

<u>Sieve Size</u>	<u>Percentage of Dry Weight Passing Designated Sieve Size</u>
1"	100
1/2"	90-100
1/4"	0-15

C. Construction Methods

Crushed stone shall be installed as per the Contract plans and to the satisfaction of the Engineer.

D. Measurement and Payment

The quantity to be measured for payment under this Section shall be the total number of cubic yards of approved crushed stone as measured in vehicles and containers.

The contract price per cubic yard of crushed stone, shall be as indicated on the BID SCHEDULE OF PRICES Items No. BMP-7.305. The bid price shall constitute full compensation for all labor, materials, equipment and work incidental thereto, necessary to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer.

No separate payment shall be made for crushed stone used as bedding for Concrete Structures. All costs shall be included in the unit cost of the Concrete Structures item, specification section 7.129.

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7.306 TREE REMOVAL AND DISPOSALA. Description of Work

Under this item, the Contractor shall cut and remove within the BMP Project limits and associate Bluebelt work areas, all trees over six (6) inches in caliper, where shown on the plans or as directed by the Engineer. Trees removed as a result of sewer construction and road work outside the limit of work described in this Addendum are not included in this item and are included elsewhere in these Contract Documents.

Trees with calipers six (6) inches or less shall be removed under the item Clearing, Grubbing and Removals.

The Contractor shall carefully protect against damage all existing trees, plants and other features to remain. He/she shall be liable for any damage to such trees, plants, structural features and other property caused by tree removal operations, and all damaged trees, plants, structural features and other property shall be replaced or restored to their original condition to the satisfaction of the Engineer.

The Contractor shall cut and remove all trees designated for removal within the limits of the Contract or as directed by the Engineer. The stumps and roots of these trees shall be removed to a depth of six (6) inches below the ground surface in grass and planted areas, and such other areas as might be designated. In areas of fill greater than six (6) inches, such trees shall be cut flush with the existing ground surface.

In areas of major construction, the stumps and roots of all trees designated for removal shall be grubbed and excavated to a depth of three (3) feet below the ground surface except in areas of fill greater than three (3) feet, where such trees may be cut flush with the ground surface.

Cutting of trees shall be done by competent workers only and in a professional manner, under the supervision of a certified arborist. All trees shall be "topped" and "limbed" previous to felling unless otherwise directed by the Engineer. For increased wildlife value, the Engineer may direct the Contractor to leave various topped and limbed tree trunks lying on the ground surface. These modifications shall be included in the unit price for tree removal. The Engineer may direct the Contractor to stockpile excavated root wads as well as topped and limbed tree trunks at a location approved by the Engineer for utilization under other items within this Contract. All branches, limbs, trunks, stumps, roots and other debris deemed not acceptable for reuse shall be removed from the site or otherwise disposed of to the satisfaction of the Engineer.

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No trees are to be removed except as ordered by the Engineer. All trees shall be calipered at four and one-half feet above existing grade prior to removal (diameter at breast height). This item shall include the removal of snag trees which are obstructing flow in stream channels because these trees have collapsed due to undermined stream banks, as directed by the Engineer. Unless directed otherwise by the Engineer, snag trees shall be flush cut where the Engineer determines that the root mass should remain to help stabilize the streambank.

B. Measurement and Payment

The quantity of tree removal to be paid for under this section shall be the number of trees of each size group, removed and disposed of in accordance with the plans and specifications and directions of the Engineer.

A tree having a single root system and more than one trunk at a height calipered at four and one-half feet above existing grade shall be considered a multiple trunk tree. The caliper of a multiple-trunk tree, to be measured for payment, shall be the square root of the summation of the squares of the calipers of the several trunks, except that trunks of less than three (3") inch caliper will not be considered or included.

The Contract price per unit for tree removal shall be as indicated on the BID SCHEDULE OF PRICES Item Nos. BMP-7.306-A through BMP-7.306-D. The prices bid shall be unit prices per tree of each size group and shall include the cost of all labor, materials and equipment necessary for removing and disposing of trees, and all other incidentals necessary or required to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer. This payment for tree removal shall include the costs for all stump removal and disposal. No payment shall be made under this section for removing stumps that existed on the site prior to tree removal operations. The removal of stumps that are on the site before any trees are removed shall be deemed included in the price bid under DETAILED SPECIFICATIONS FOR CLEARING, GRUBBING AND REMOVALS.

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7.307A GRADINGA. Description of Work

The Contractor shall furnish all labor, materials, equipment and services necessary to perform all grading as indicated on the Contract Drawings and as specified herein.

B. General Requirements

1. General Specifications - Except as modified and supplemented hereinafter in the Detailed Specifications, work performed under this Section shall conform to the NYCDEP Standard Sewer Specifications.
2. Shop Drawings - The Contractor shall submit to the Engineer for approval shop drawings and other documentation required to show conformance with the requirements set forth on the Contract Drawings and these Specifications. Shop drawings shall include, but not be limited to, the requirements for shop drawings as specified in the Standard Sewer Specifications.

C. Grading – The Contractor shall perform filling, compacting, and grading of the indicated areas of site, including minor cutting and filling high and low areas, and leveling such areas to elevations and within limits shown on the Contract Drawings. All work shall be performed in accordance with the applicable requirements of the NYCDEP Standard Sewer Specifications.D. Compaction

1. BMP Areas – Compaction shall not be done in BMP and landscaped areas.
2. Other Areas – Each layer of fill or backfill shall be compacted by a minimum of four complete passes with an approved tamping roller, pneumatic-tired roller, three-wheel power roller, or other approved compaction requirement. Compaction shall not be less than 95 percent of the maximum density modified proctor as determined by ASTM D1557, Method D.
3. Field Control – Sufficient in place density tests shall be performed by the Contractor in order to satisfy the Engineer that the specified density is being obtained. These tests shall be made at no cost to the City and shall be made using the calibrated sand cone method (ASTM D1556) or other method as determined by the Engineer.

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- E. Finished Excavation, Fills, and Embankments – All areas covered by the project, including excavated and filled sections and adjacent transition areas, shall be uniformly graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from blade-grader operations. Surfaces shall be finished not more than 0.15 foot above or below the established grade or approved cross section.
- F. Protection – Newly graded areas shall be protected from traffic and erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades re-established to the required elevations and slopes, at no additional expense to the City.

The Contractor shall provide temporary ground cover sufficient to restrain erosion on all disturbed areas upon which further active construction is not taking place.

- G. Measurement and Payment

The quantity to be measured for payment under the pay item Grading shall be the total number of square feet of work area graded. The contract price per square foot for grading shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.307-A. The bid price shall constitute full compensation for labor, materials, equipment and work incidental thereto, necessary to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.308 FILL ON-SITEA. Description of Work

This work shall consist of providing and placing approved fill material where required throughout the project area only. The Contractor may use approved fill material excavated from sewer and foundation trenches and stockpiled excavated soils within BMP project limits as long as it meets the approved definition. Reuse of onsite excavated material requires that the material be screened prior to placement as fill. The approved fill material shall be provided, placed, spread, compacted and fine graded to the elevations, lines, grades and cross-sections indicated on the drawings as directed by the Engineer.

B. Definition

Approved fill is hereby defined as clean earth, consisting of a mixture of silt and clay. Fill material shall have a liquid limit less than or equal to 40 and a plasticity index less than or equal to 20, as determined by ASTM D4318. This mixture must be free of any roots, trees, tree stumps, leaves or other organic matter. Furthermore, this material must also be free of any metals, masonry (i.e. construction debris), stones over one and one-half (1-1/2) inches in diameter and deleterious material. In addition, the fill shall have a gradation such that 100% (by weight) passes a 3" sieve, 50-100% passes a #10 sieve, 20-90% passes a #60 sieve, and 0-20% passes a #200 sieve.

Fill used in planted areas shall be clean earth, consisting of a mixture of silt, clay, and sand. No custom ("select fill") fill shall be used in area which are to be planted.

C. Measurement and Payment

The quantity to be measured for payment under this Section shall be the total number of cubic yards of approved fill, measured in containers or vehicles, provided and placed as indicated on the Contract Drawings and as directed by the Engineer.

The contract price per cubic yard of approved fill material placed shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.308. The bid price shall constitute full compensation for all labor, materials, equipment and work incidental thereto, necessary to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer.

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No separate payment shall be made for fill used to backfill structures. All costs shall be included in the unit cost of the Concrete Structures item, specification section 7.129.

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7.309

IN-STREAM SEDIMENT REMOVAL

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7.310 PLANT AND SOD SALVAGEA. Work Included

The Contractor shall furnish all labor, materials, equipment and services necessary for Plant and Sod Salvage as indicated on the Contract Drawings and as specified herein. Plant salvage involves many ecological, horticultural and site-specific issues and shall be designed and supervised by the Restoration Specialist.

B. Manual Plant Salvage

Activities under this item shall include all work necessary and incidental for the removal, storage and transplanting of existing native small trees, shrubs and herbaceous plant material. Work shall be done under the guidance of the Restoration Specialist with experience in transplanting and nurserymen techniques. Plant salvage activities shall precede the use of heavy trucks, excavating or grading equipment in salvage areas, except equipment used for the salvage work itself.

Transplanting is only to occur when plants are dormant during the fall and winter and when soil is moist. Evergreen material shall be transplanted from April 1st to May 15th and from September 1st to October 15th. Deciduous material shall be transplanted from March 1st to May 1st and from October 15th to December 1st. Only trees and shrubs that lack insect or disease damage shall be transplanted. The majority of trees and shrubs salvaged shall not exceed five (5) feet in height as larger specimens have a higher mortality rate.

All plants shall be dug to retain as many fibrous roots as possible and the roots shall be contained securely in place. The Contractor shall use approved transplanting equipment. Temporary storage shall be in suitably sized containers or, where appropriate, as burlap wrapped balls. Root balls of trees and shrubs shall be wrapped with wet burlap to prevent soil from separating from roots and desiccation. Size and weight of root balls shall be in accordance with Table 3.5 "Size and Weight of Earth Ball Required to Transplant Wild Stock" in the latest edition of the New York State Standards and Specifications for Erosion and Sediment Control, published by the Empire State Chapter of the Soil and Water Conservation Society. After transplanting, all shrubs shall be pruned and watered in accordance with standard horticultural practices.

C. Plant Removal

The following specifications shall be used to properly remove plants. A straight edged spade shall be used to manually remove herbaceous plants

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and small shrubs and trees. For plant material under three (3) feet tall, a spade shall be plunged straight down around the material to be removed at least eight (8) inches from stem. The cut around plant material taller than three (3) feet shall be a minimum of one (1) foot. The spade shall then be carefully worked under the roots. If a large root is encountered, it shall be cut cleanly with sharp pruning shears or loppers. Small plants shall be lifted out of ground, keeping root ball and associated soil intact and placed in temporary containers of appropriate size. The soil within the containers shall be covered with wet mulch, wood chips or leaves and kept moist.

Shrubs and trees larger than three (3) feet shall be removed in the following manner. Two people shall be used for removing such material. An appropriately sized piece of burlap shall be placed alongside the plant material to be removed. The spade head shall be placed under the root ball. While one person pries the plant up with the spade handle, the other shall grasp the plant at the base of the stem. Using the spade to support the root ball, the plant shall be lifted out of the hole and placed on the burlap. The corners of the burlap shall be pulled up around the root ball and natural twine (not nylon or plastic) shall be used to tie it around the root ball. The burlap and root ball shall be immediately watered. Roots shall not be allowed to become dry or be exposed to air.

D.

Storage

Under ideal circumstances, salvaged material shall be transplanted immediately to the donor site. If storage is necessary and approved by the Restoration Specialist, salvaged plants shall be stored temporarily at a designated storage location, properly heeled in and watered until such time that they are used for re-establishment. The temporary storage area shall be scraped to remove weeds and weed seeds before plants are stored and shall have the same soil type, exposure and hydrological regime as the donor site. The temporary storage area shall be completely fenced with plastic snow fence or welded wire fence. The top two (2) inches of the container as well as spaces between the containers shall be filled with wet mulch, wood chips or leaves. The salvaged plants shall be planted as soon as designated receptor sites are available during the dormant season.

A capillary bed shall be constructed for wetland plant storage at the discretion of the Restoration Specialist. The frame of the capillary bed shall be one (1) foot deep and four (4) feet wide by ten (10) feet long. The frame shall be lined with heavy plastic (>3 mil) and filled with approved soil or mulch. Holes are to be punched in the plastic liner in each corner six (6) inches from the bottom of the frame. This will prevent the entire bed from filling with water. At least two (2) inches of water shall be maintained in the capillary bed at all times.

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Plants shall be potted prior to placement within the capillary bed as this will reduce the number of times the roots will need to be disturbed. Potted plants are to be placed in the bed and surrounded and partially covered with soil or mulch. Plants shall not be stored for more than one (1) year.

E. Tree and Shrub Transplanting

Prior to transplanting, shrubs and trees should be tagged and their future locations selected and marked by the Restoration Specialist. Plant material shall only be transplanted during the dormant season.

If plant material is to be stored prior to planting, the material shall be properly balled or containerized as per sound horticultural practices (American Association of Nurserymen Standards) and toed into the soil in an appropriate predetermined location. The storage site shall be approved by the Restoration Specialist and have the same soil type, exposure and hydrology as the donor site. The temporary storage area is described in paragraph D.

Evergreen material shall be transplanted from April 1st to May 15th and from September 1st to October 15th. Deciduous material shall be transplanted from March 1st to May 1st and from October 15th to December 1st. Only trees and shrubs that lack insect or disease damage shall be transplanted. The majority of trees and shrubs salvaged shall not exceed six (6) feet in height as larger specimens have a higher mortality rate.

F. Whole Sod Salvage

Whole sod placement shall be done under the guidance of a Restoration Specialist with experience in sod salvage. The Contractor shall remove whole sods from all designated donor wetlands, including native moss mats, sedge and fern tussocks, woody hummocks, whole shrubs and small trees and associated herbaceous vegetation. The salvaged sod shall be transported and placed into the created wetland over previously-placed organic sediments or over mineral soils, depending on the depth of sod. Sods shall be cut, transported and placed such that the sods and plants remain substantially intact and plants and roots maintain their accustomed

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vertical and horizontal orientations. Whole sod cutting shall be capable of transporting trees up to two (2) inches in caliper and ten (10) feet in height.

Whole sod cutters shall be manufactured by Munro Ecological Services, or approved equal. The referenced manufacturer supplies hydraulically-operated attachments equipped for positive sod displacement.

Salvage and placement of whole sod and organic soils shall occur in tandem so that all salvage equipment can work on firm mineral soil and there is no unnecessary treading of organic soil, sods or plant material. Sods shall not be stored without the approval of the Restoration Specialist and requires the use of specialized storage equipment.

The work shall proceed as follows:

1. A rank of whole sod shall be cut and removed from the edge of the donor site. If the sod is of the proper thickness, it may be placed directly into the receptor site. The sod shall otherwise be set aside temporarily until the receiving subgrades are properly prepared.
2. If underlying organic soils are to be salvaged from donor sites, it should be excavated and transported to the receiving wetland in such a way as to prevent unnecessary treading by heavy equipment.
3. If both underlying organic (A horizon) soils and mineral (B horizon) soils are to be salvaged from donor sites, they shall be excavated and stockpiled separately, and transported and placed into the receptor site in separate lifts, as they existed in-situ. The soil horizons shall be tamped, not compacted in place. Soils shall be excavated and transported to the receptor site in such a way as to prevent unnecessary treading by heavy equipment.
4. Salvaged whole sods shall be carefully placed on top of those sediments or elsewhere on mineral soils.
5. Another rank of whole sods shall be cut and removed from the donor site.
6. All organic sediments underlying the removed rank of sods shall be excavated, transported, distributed and then salvaged. Whole sods shall be placed on top.
7. This procedure shall be repeated until all usable whole sods have been salvaged to the satisfaction of the Restoration Specialist. Sods shall be placed deliberately spaced apart as well as contiguously to

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imitate the irregularity of other existing wetlands in the area. The Restoration Specialist shall inspect local "model" wetlands prior to placement of whole sods to better understand the desired pattern of layout.

8. Sod placement shall be true to elevation as shown on the plans. Target elevations shall be corrected by the Contractor if actual site conditions appear to differ from projected site conditions during and after excavation.

G. Plant Salvage at BMPs

Within this contract, the BMPs' periphery and adjacent areas will be recontoured and restored. As such, the BMP edge and adjacent areas shall serve as the donor site for both soils and plant salvage.

Prior to salvaging plants and soil, the receptor site shall be fully prepared. The plant material shall be excavated including the soil to a depth of 18". Extreme care shall be taken to avoid damaging plants or crumbling soil below. If the receptor site is deeper than 18", additional soil shall be excavated from the donor site to be placed below. This material shall be stockpiled on tarps and placed separately prior to the placing of the top 18" layer. The plant material and topsoil shall be stored on tarps, kept moist and protected until it can be placed. Work shall be scheduled so that plant material can be transplanted within thirty six (36) hours of being excavated. Method for transplanting material shall be selected to minimize compaction of soil. Soil shall be tamped, not compacted in place. Salvaged plant material shall be well-watered in place.

The material to be salvaged shall include the plant species listed below, but shall not be limited to these plants, as determined by the Restoration Specialist. In the areas to be excavated, locate and transport the following species to the cleared areas (plants are listed in order of importance to salvage):

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Woody Plants

Acer negundo _____	Box-Elder
Acer spp. _____	Maple saplings
Quercus spp. _____	Oak saplings
Salix nigra _____	Black Willow
Cornus amomum _____	Silky Dogwood
Rubus spp. _____	Raspberry
Sambucus canadensis _____	Elderberry
Viburnum dentatum _____	Arrowwood Viburnum

Perennials and Herbaceous Plants

Peltandra virginica _____	Arrow Arum
Carex spp. _____	Sedges Eupatorium spp.
Solidago spp. _____	Goldenrod
Typha spp. _____	Cat-Tail
Symplocarpus foetidus _____	Skunk-Cabbage
Parthenocissus quinquefolia _____	Virginia Creeper

H. Measurement and Payment

The quantity to be measured for payment under this section shall be the total number of hours necessary for completion of Plant Salvage activities.

The contract price per unit for Plant Salvage shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.310-A4. The unit price bid shall include the costs for all labor, materials, equipment and incidental expenses necessary or required to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.311

CONSTRUCTED WETLAND TREATMENT

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7.312 DEMOLITION AND SITE CLEARING

- A. Description of Work - The Contractor shall demolish, remove, and dispose of all existing structures, to the extent indicated and as specified herein.

Items to be demolished and cleared include, but are not limited to, the following:

1. All structures, including fences, sheds, and planters that encroach into the Bluebelt Property as directed by NYCDEP.

B. General Requirements

All demolition and removals shall be in accordance with the New York City Building Code.

1. Shop Drawings - The Contractor shall submit to the Engineer for approval shop drawings and other material required to substantiate conformance to the requirements set forth in these Specifications. Shop drawings shall include, but not be limited to, the extent and schedule of demolition, demolition procedure, safety precautions as specified. Approval of shop drawings by the Engineer is required before demolition may be started. The Contractor shall verify the existing conditions of the structures and site prior to submitting the Shop Drawings.
2. Permits to be Obtained - Before proceeding with the demolition and clearing work, the Contractor shall obtain all necessary permits required by the City Departments and other agencies having jurisdiction.
3. The Contractor shall provide adequate fire protection during demolition in accordance with New York City Fire Department Requirements.
4. The Contractor shall obtain all necessary approvals from all utilities in regards to disconnecting all existing utility connections. The Contractor shall remove all utility lines in the driveway of the structure to be demolished up to St. George Road.

C. Demolition Procedures

General

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1. The contractor shall coordinate with NYCDEP/NYCDDC to notify the property owners of the encroachments. Following authorization from NYCDEP, the contractor shall remove all encroachments from the Bluebelt property.
2. The limits of demolition are:
 - a. The encroachments from Lots 3, Block 3723 and Lots 11, 12 and 45 on Block 3790.
 - b. The existing outlet structure adjacent to Freeborn Street at BMP NC-7.
 - c. Asphalt and concrete paving, curbs and fencing as required.
 - d. All debris surrounding the structures shall also be removed and disposed of off-site.
 - e. Use of explosives shall not be permitted.
 - f. In performance of this work, the Contractor shall provide protection of adjacent existing structures and existing vegetation. Any trees or shrubs damaged or removed by the Contractor during demolition activities shall be replaced by the Contractor at no additional expense to the City.
3. Clearing and Grading - Resulting excavation from the demolition of the structures shall be backfilled and compacted to conform to surrounding grades. All associated debris materials shall be removed from site and disposed of by Contractor. Burning will not be permitted.
4. Restoration - The backfilled and graded demolition site shall be restored in accordance with specification sections 7.401.3 paragraph I and specification section 7.403. The restoration will include the preparation and application of topsoil over the demolition and clear area and the planting of trees, shrubs and herbaceous plants and the application of Staten Island Native Wildflower Meadow Seed Mix, per 7.401. All restoration work shall be as directed by the Restoration Specialist who shall prepare a detailed plan for planting the cleared site.
5. Disposal - All materials resulting from the demolition work will become the property of the Contractor. The materials shall be removed from site to Contractor's own place of disposal at Contractor's expense in conformance with existing applicable laws and regulations.

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D. Measurement and Payment

The quantity to be measured for payment for demolition under this Section shall be the total number of cubic yards of material removed and disposed as directed by the Engineer. Measurements shall be paid under the proper bid items and the quantity to be paid for will be (8/10) of the yardage determined by such measurements.

The contract price per cubic yard of demolition material removed shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.312-C. for non-hazardous material and BMP-7312-D for hazardous material. The bid price shall constitute full compensation for all labor, materials, equipment and work incidental thereto, necessary to complete this item in accordance with the plans and specifications to the satisfaction of the Engineer. No separate payment shall be made for any work by the Contractor concerning disconnecting and removing of the utility lines. The cost of all planting (topsoil, trees, shrubs, wildflower seed mix) shall be paid from those existing items.

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7.313

REMOVAL OF POND SEDIMENTS

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7.314

DISPOSAL OF OUTFALL CHAMBER SEDIMENTS

NO TEXT ON THIS PAGE

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7.315

GREENBELT/RICHMOND CREEK RESTORATION

NO TEXT ON THIS PAGE

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7.316

GREENBELT/RICHMOND CREEK RESTORATION ALLOTMENT

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7.317 SOIL SAMPLING AND DISPOSALA. Description of Work Included

Contractor shall provide all labor, materials, tools, and equipment to perform all operations necessary to determine the in-situ classification, and handling and disposal requirements of all soils and fill materials in the area to be excavated during construction.

The Contractor shall develop and implement an In-situ Soil Sampling and Analysis Plan required for sampling, quality assurance and quality control (QA/QC) of work. Work includes, but is not necessarily limited to, sampling and analysis of on-site soils.

The Contractor shall provide a Field Sampling Plan to test all soils and fill materials for presence of chemicals to determine if material is Hazardous Waste, Industrial Waste, Petroleum-contaminated Waste or Construction and Demolition Debris.

The Contractor shall provide the services of a laboratory, certified by New York State Department of Health, to perform testing and chemical analyses.

The Contractor shall develop and implement a Plan for the handling and disposal of any anticipated or unforeseen contaminated or hazardous materials, and for the additional health and safety precautions needed to enable construction operations to proceed safely in the presence of these materials.

B. Submittals

The Contractor shall provide for submittal the following:

1. Field Sampling Plan (FSP): An FSP shall be submitted to the Engineer for approval 30 days following notice to proceed. The FSP shall include protocols for the collection and analysis of representative samples from the soil based on the receiving disposal facilities' protocols including sampling frequency and analysis requirements as described in Article 1.10. The Engineer will approve the FSP only if it clearly provides the information to allow for classification of all material proposed for excavation. 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. A detailed outline of the disposal facility requirements. The information, including analytical requirements and sampling

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frequency specified by the disposal facilities shall be submitted to the Engineer and used by the Contractor in preparing the site-specific FSP.

- b. The FSP shall include an indication of the specific frequency of in-situ samples per unit volume as required by the approved disposal facility chosen by the Contractor, but not fewer than one composite sample for each 500 cubic yards of material to be excavated. Parameters analyzed shall be at a minimum full RCRA Characteristics including ignitability, corrosivity, reactivity, and full Toxicity Characteristic Leachate Procedure (TCLP) for volatiles, semi-volatiles, metals, pesticides and herbicides, and as required by the disposal facility. The area to be excavated shall be divided into distinct vertical and horizontal segments, identifying the volume of soil or fill that each sample will represent. The FSP shall include vertically continuous sampling to allow for compositing of samples for proper classification of soils.
- c. A scaled map of the site showing existing fixed landmarks and the proposed excavation limits. The map shall contain specific sampling locations that will conform to the disposal facilities' sampling frequency requirements.
- d. Identification numbers of the sample grids, relative depth, sampling intervals, and volumes reflective of the Contractor's excavation method shall be shown on the scaled site map. 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 varied native soil and fill material.
- e. Description of sampling procedures and equipment to be used.
- f. Name and address of Analytical Laboratory, copy of laboratory certification, Quality Assurance Manual, and Standard Operating Procedures for the analyses to be performed.
- g. Description of QA/QC samples required by the disposal facilities.
- h. Description of additional disposal facility requirements.

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2. **In-situ Soil Sampling and Analysis Plan:** The primary objective of this plan is to characterize on-site soils for transport and disposal off-site. An In-situ Soil Sampling and Analysis Plan (ISSAP) includes a detailed description of techniques used to select sampling sites, thoroughly addresses procedures to be used to obtain representative samples of the media to be sampled, and describes sampling parameters and methods, as required by the disposal facility, sampling equipment, containers, sample number and volume, preservation, and holding times. This plan will also include QA/QC procedures and a quality management (QM) plan. The ISSAP shall address all requirements of these specifications and all requirements of New York State, EPA and OSHA and the selected disposal facility. If any conflicts arise between different agency procedures, the Engineer will determine which method is to be used. The Contractor shall submit the ISSAP to the Engineer for review and approval a minimum of 30 calendar days prior to the scheduled commencement of excavation activities. No excavation work will be allowed until all changes required by the Engineer are made and the ISSAP is accepted in writing by the Engineer. The ISSAP shall include at a minimum the following elements:
- a. The organizational structure of the Contractor's and all subcontractor's quality management (QM) personnel, including their:
 - (i) names
 - (ii) resumes
 - (iii) responsibilities
 - (iv) authorities
 - (v) qualifications
 - b. A copy of a letter signed by a responsible corporate officer of the Contractor describing the authority and responsibilities of the Sampling and Analysis Manager.
 - c. **Laboratory Requirements and Qualifications.** The subcontracting laboratory's name, certifications, Quality Assurance Manual, and Standard Operating Procedures (SOPs) for the analyses to be performed shall be submitted to the Engineer and the City for review and approval.

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- d. Proposed sampling, handling, preservation, and storage of equipment and procedures, including transfer procedures, and sampling equipment decontamination procedures.
 - e. Analytical Methods. Proposed analytical methods shall be in accordance with SW-846, latest edition. If an SW-846 Method is not available, then EPA 600/4-79-020 shall be used.
 - f. Data Quality Objectives. 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 shall be defined.
 - g. Schedule of field and laboratory inspections.
 - h. Planned preparation of daily and project summary quality control reports.
 - i. A statement that the sampling program is in accordance with the Contract requirements.
 - j. Precise number and approximate location of samples to be collected and the specific analyses to be performed on each sample, presented in a Microsoft Excel table, and on a working drawing that is keyed to the Contract Drawings.
 - k. Manufacturer, catalog data and calibration records of all analytical equipment to be used on-site.
3. Field Sampling Summary Report: The field sampling summary report shall contain all laboratory analytical results obtained from the field sampling event. A detailed account of any field procedures used which deviated from those established in the FSP shall be included, as well as a complete set of field notes. Detailed field notes shall be maintained by the Contractor during sampling and excavation to allow identification of sample analysis results with the respective grids that the data represent, and to verify quantities of materials to be disposed of as hazardous waste, industrial waste, petroleum-contaminated waste or C&D debris. The field notes shall be made available to the CM/Engineer during the sampling program, and shall consist of:
- a. Boring or probe logs from each sampling location containing a continuous stratigraphic description of all material

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encountered to the excavation depth required. Descriptions of material shall include, but not be limited to, color, odor, staining, relative grain size distribution, material composition, moisture content, and cohesive properties.

- b. The location of each sampling point on a scaled map.
 - c. Depth intervals for each sample, whether a grab or composite, and any special notes, which are included on the laboratory chain-of-custody forms.
 - d. Copies of all laboratory chain-of-custody forms for samples that are collected for analysis.
4. Analytical Results: Contractor shall submit analytical results for sampled soil material to the Engineer within 3 calendar days of receipt of such data from the laboratory.
 5. Statement of Qualifications for the Environmental Consultant. The Statement of Qualifications should include Firm qualifications for the work involved, resumes of key personnel to be employed on the project, years of experience of the Firm and employees, references, and any other information the Environmental Consultant feels is necessary to prove the Firm's qualifications for performing the requested work.

C. Quality Assurance

1. Laboratory Requirements: Laboratory facilities shall meet, at a minimum, the requirements and procedures of this specification. The laboratory is subject to inspection and prior approval by the Engineer.
 - a. Provide and coordinate the services of a laboratory(ies) to perform specified services and analyses. Laboratory services shall be provided for the duration of the work.
 - b. The laboratory shall maintain, throughout the duration of the work, the appropriate New York State Department of Health ELAP Certifications for the analyses to be performed.
2. Permits and Regulations:
 - a. The Contractor shall obtain all necessary permits and perform all work in compliance with applicable

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requirements of OSHA and other governing authorities having jurisdiction.

- b. Codes and Standards: State and City laws and code requirements shall govern the transport and disposal of trees, shrubs, stumps, roots, rubbish, debris and other matter.
3. Laboratory Qualifications:
- a. Analytical Methods and Procedures: Fully describe and provide references (SOPs) for the specific analytical methods and procedures which will be used to perform all soil chemical analyses associated with this project. The analytical methods and procedures shall be used to determine sample characterization and suitability for transportation and disposal.
 - b. Quality Control Checks and Data Acceptance: Provide a system of internal quality control checks designed to establish technically sound criteria for each measurement parameter, which will serve to accept or reject data in a uniform and systematic manner. A minimum of ten percent of the total number of a given type of sample shall be devoted to internal QC checks, or more, as specified in the laboratory SOP. These checks are designed to insure accuracy in the sampling procedure and the analytical methods and include blanks, duplicates, matrix spikes, reference standards and performance evaluation samples.
4. Data Management: Manage the analytical data by utilizing a computer spreadsheet or database program as approved by the Engineer. Data shall be organized in such a way that all samples may be tracked from collection through analysis.
- a. The analytical results generated for a ten (10) 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.
 - b. The final data package generated by the laboratory shall include the following information:
 - (i) A Form I showing pertinent physical data presented in concise, easy to follow formats (i.e., sample number, laboratory ID, client, date of sample

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preparation, date analyzed, percent moisture, dilution factor, sample matrix, units, undetected and detected compounds, etc.)

- (ii) Reference to analytical methodology used
 - (iii) General discussion including a description of sample types, tests performed, any problems encountered, and any general comments (case narrative)
 - (iv) 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
 - (v) Associated quality control samples such as blanks, spikes and spike duplicates, laboratory duplicates, laboratory control samples, field duplicates and appropriate check standards
 - (vi) Copies of chain-of-custody sheets
 - (vii) The analytical results shall be provided in a tabular Microsoft Excel 2003 format, delivered on 3-1/2 inch diskettes or via electronic mail to the Engineer. All electronic data shall be certified to be virus-free.
5. In-situ Sampling: All material shall be in-situ sampled and analyzed in accordance with the disposal facility requirements as specified in the Detailed Specifications.
- a. Field duplicate samples shall be collected for a minimum of 10 percent of the samples spaced throughout the sample program.
 - b. The number of samples required for a quantity of soil shall meet all disposal facility requirements, and the approval of the Engineer.
6. 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 10 days is required due to delays in construction scheduling or other constraints, Contractor shall provide for such at no additional cost to the City.

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7. Disposal Facility Selection: If the approved disposal facility is not available when disposal operation begins, the Contractor shall be fully responsible for procuring approved disposal facilities at no additional cost to the City. Any additional sampling and analysis required and labor involved in submitting new disposal facilities after the initial disposal facilities are accepted shall be the responsibility of the Contractor.
8. The Contractor shall retain the services of a qualified Environmental Consultant who shall prepare and implement the Field Sampling Plan and In-Situ Soil Sampling and Analysis Plan as detailed herein. The Environmental Consultant shall have the authority to practice engineering in the state of New York, have at least 3 years in performing similar work, and shall be familiar with the requirements of EPA, OSHA, the NYSDEC Solid Waste Regulations, and classifying soil materials generated by construction projects. Failure to demonstrate such qualifications will result in the Engineer's rejection of the Environmental Consultant.

D. Delivery, Storage and Handling

1. Sample Identification: 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. 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.
2. Sample Labels: The field team shall complete the following information on a sample label for each sample bottle:
 - a. Site Name.
 - b. Job Number.
 - c. Sample Number.
 - d. Sample Description.
 - e. Company Name.
 - f. Parameters to be Analyzed.

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- g. Date.
 - h. Time.
 - i. Preservation Technique Employed.
 - j. Sample labels shall be attached to the sample bottles.
3. Completion of Chain-of-Custody Record:
- a. 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.
4. 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. Time: Enter a four-digit number indicating the time of collection in 24-hour time; for example, 1354.
 - f. Composite or grab: Indicate the type and matrix of sample.
 - g. Station location: Describe the location where the sample was collected.
 - h. Number of containers: For each sample number, enter the number of sample bottles that are contained in the shipment.
 - i. Remarks: Enter any appropriate remarks.

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5. Sample Shipment:
- a. Custody of samples shall be maintained through 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:
- (i) Use waterproof high-strength plastic ice chests or coolers only.
 - (ii) 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 VOA sample bottles, secure the lid with tape. (Tape on VOA bottles may cause contamination.)
 - (iii) Place inert cushioning material such as vermiculite or "bubble-wrap" in the bottom of the cooler.
 - (iv) 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.
 - (v) 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.
 - (vi) Fill cooler with cushioning material.
 - (vii) Put paperwork (chain-of-custody record) in a waterproof plastic bag and tape it with packing tape to the inside lid of the cooler.
 - (viii) Tape the drain shut.
 - (ix) Secure lid by taping. Wrap the cooler completely with strapping tape at a minimum of two locations. Do not cover any labels.
 - (x) Attach completed shipping label to top of the cooler.

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- (xi) Put "This Side Up" labels on all four sides and "Fragile" labels on at least two sides of coolers containing glass containers.
 - (xii) Ship the cooler overnight by commercial carrier (e.g., Federal Express, UPS), laboratory carrier or field personnel to the respective laboratory.
- b. 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.
 - c. 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.
6. Transferring Custody of Samples to Shipper, if applicable: Contractor shall transfer custody of samples to a shipper as follows:
- a. Sign, date, and enter time on the chain-of-custody report under "Relinquished by."
 - b. Make certain that shipper signs the "Received by" entry.
 - c. 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.
7. Transferring Custody from Sampler or Shipper to Common Carrier:
- a. The shipper or Contractor shall transfer custody of samples to a common carrier as follows:
 - (i) Sign, date, and enter time under "Relinquished by" entry.
 - (ii) Enter name of carrier (e.g., UPS, Federal Express) under "Received by."
 - (iii) Enter bill-of-lading or Federal Express airbill number under "Remarks."

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- (iv) Place the original of the chain-of-custody form in the appropriate sample shipping package. Retain a copy with field records.
 - (v) 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.
 - (vi) Wrap the seal across filament tape which has been wrapped around the hinges of the shipping package at least twice.
 - (vii) Fold the custody seal over on itself so that it sticks together.
 - (viii) Complete other carrier-required shipping papers.
- b. 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.
8. 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.

E. Project Conditions

1. 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 tap water.
 - b. Triple rinse with tap water.
 - c. Rinse with isopropyl alcohol, or if samples are visibly contaminated with petroleum use a solvent, such as hexane.
 - d. Triple rinse with analyte-free water.

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2. Disposal of Decontamination Solutions: Collect all decontamination solution and dispose of it through a licensed chemical waste disposal service if it is unsuitable for treatment on-site by incorporation into existing on-site treatment processes.

F. Analyses

1. The services of a certified New York State Department of Health laboratory shall be engaged to perform testing and chemical analyses. The laboratory shall be acceptable to the Engineer. Testing and Chemical analyses shall include full RCRA Characteristics, at a minimum, and the following:
 - a. In-Situ Soil Testing: The in-situ soil sampling and testing protocols listed in the Detailed Specifications for each disposal facility are included for the Contractor's convenience. The analytical requirements of the disposal facilities are subject to change and it shall be the Contractor's responsibility to confirm and comply with all requirements of the chosen disposal facility.
 - b. All analytical results shall be submitted to the Engineer for review within 10 calendar days of date of collection.
2. Following completion of the field sampling program and prior to excavation, the Contractor's Environmental Consultant shall prepare **and submit for Engineer's approval** the Field Sampling Summary Report, and shall classify all soil material in accordance with NYSDEC Solid Waste Regulations, using the definitions provided herein.
3. Submit disposal plan and proposed disposal facility for Engineer's approval.

G. Execution

1. In-Situ Testing
 - a. Conduct testing in accordance with the Detailed Specifications and the approved Field Sampling Plan.
 - b. Field sampling shall be completed in ample time to prevent delay of the excavation work or the work of any other contractor.

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1. The Contractor is advised that there may be excavation materials present at the site within the designated work areas that are deemed “regulated contaminated material”. In-situ sampling shall be performed in accordance with this specification in order to confirm this to the satisfaction of the disposal facility.
2. The Contractor shall be responsible for all sampling, special handling and disposal measures necessary to remove and dispose of the materials in accordance with all Federal, State, City and local laws and the Contract Documents.
3. The Contractor shall segregate contaminated fill materials from clean native materials on site.
4. The contaminated fill material will require offsite disposal as regulated contaminated material (non-hazardous waste).
5. As applicable to their work, the contractor is required to incorporate these minimum requirements into his health and safety plan (or other applicable submittal), to ensure a safe and healthful working environment. The plan shall address at minimum the following items:
 - a. **Personnel Training:**
 - (i) Describe the training requirements for workers responsible for the removal or disturbance of contaminated material.
 - b. **Medical Surveillance:**
 - (i) Describe the medical surveillance program for workers for the removal or disturbance of contaminated.
 - c. **Site Control Measures:**
 - (i) Define the site control methods and site communications, including a site map delineating the control areas, as appropriate.

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- (ii) Delineate the work areas, including an exclusion zone, contamination reduction zone, and support zone. Describe the allowed activities in each zone.
 - (iii) Define stockpile areas for the staging of native soil materials during the time frame that analyses are pending.
- d. Engineering Control Measures:
- (i) Identify methods to control the generation of airborne particulates during excavation activities affecting contaminated materials (e.g., surface and subsurface contamination, etc.).
- e. Decontamination Program
- (i) Describe the decontamination procedures for personnel and equipment in direct contact with known or potentially contaminated materials. Minimum requirements shall include:
 - (a) The thorough decontamination of all equipment prior to leaving the site(s) using a dedicated decontamination station.
 - (b) Storage, classification, and appropriate disposal procedures for solids and rinse water produced during the decontamination process.
 - (c) Provisions for hand wash facilities and lunch/break areas.
 - (d) Decontamination must also be performed in accordance with the OSHA Lead in Construction Standard (29 CFR 1926.62 (I)).

I. Remedial Action for Unforeseen Hazardous Materials

- 1. The possibility also exists of encountering other hazardous materials at locations where its presence could not be inferred 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

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Engineer will direct the Contractor to engage the services of a Hazardous Materials Specialist to perform the necessary investigation and develop the remediation plan.

2. The Contractor shall be responsible for identifying previously unknown and suspect hazardous materials as they are encountered. Indication of the presence of hazardous materials, including odorous or stained soils, sediment or liquids, must be immediately reported to the Engineer.
3. When remedial action is necessary for unforeseen hazardous materials or an upgrade in health and safety protocol requiring special expertise is necessary, the Engineer will submit the scope of work in writing to the Contractor. The Contractor shall then obtain proposals for the work, including prices, from three separate DEP approved certified hazardous material specialists, and submit them in writing to the Engineer within ten (10) consecutive calendar days of receiving the scope of work. The Engineer may select one proposal and direct the Contractor to engage the selected remediation specialist as a Subcontractor. Remediation work shall not commence until the Contractor receives written notice from the Engineer to proceed with the work. All remediation work shall be performed by the certified remediation specialist.
4. Some of the remediation work may be critical to maintaining construction schedules. When this occurs, a time of completion will be indicated in the scope of work submitted to the Contractor by the Engineer.
5. Disposal of wastes generated by remediation work shall be based on the results for testing performed by the Contractor. Disposal of remediated hazardous material shall be at a site approved by the Environmental Protection Agency and applicable state agency to accept such waste. The Contractor shall notify the Engineer at least fourteen (14) days prior to removal of the containers of hazardous material to allow for inspection of the containers and the hazardous waste manifest.
6. The Contractor shall submit written evidence that the receiving waste treatment, storage, or disposal facility is approved to receive such waste by the EPA and State or local regulatory agencies. Submit copies of the complete manifest, signed and dated by the initial transporter in accordance with Federal and State requirements. Completed and signed hazardous waste manifests from treatment or disposal facility with complete chain of custody shall be provided to the City within seven (7) days of disposal.

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J. Measurement and Payment

1. The contract price for payment of Soil Sampling and Analysis as described in this specification shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.317-A. This contract item shall include all costs for labor and materials related to the development and implementation of an In-Situ Soil Sampling and Analysis Plan and Field Sampling Plan as described above.

2. The contract price for payment of Contaminated Soil and Hazardous Waste Disposal is a fixed sum and shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.317-B. The maximum allowance for this item shall be \$500,000. This contract item shall provide for the costs of handling, transportation and offsite disposal of regulated contaminated and hazardous material encountered in the course of excavation, and for the additional health and safety precautions needed to enable construction operations to proceed safely in the presence of this material. Payment for the disposal of contaminated material will not be made until a signed copy of the manifest from the treatment and disposal facility certifying the amount of materials delivered is returned with complete chain of custody documentation to the City and the Engineer. This allowance shall also provide for the costs of the development and implementation of a Plan for the handling and disposal of the unforeseen contaminated or hazardous materials, and for the additional health and safety precautions needed to enable construction operations to proceed safely in the presence of these materials.

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LANDSCAPING AND RESTORATION WORK

7.400 Work Included

Under landscaping and restoration work, the Contractor shall provide labor, materials, tools and equipment necessary to complete the execution of the work in complete accordance with the Specifications and all Contract Drawings. The work shall include items of work specified under the following sections.

<u>Section Number</u>	<u>Title</u>
7.401	Landscaping for Terrestrial Zone and Wetland Zone
7.403	Top Soil for Restored Area
7.405	Vector, Pest and Wildlife Control
7.407	Jute Mesh
7.408B	Herbicide Application
7.410	Plant Protection Fence
7.414	BMP As-Built Plans
7.415	Vine and Invasive Plant Removal
7.418	Sand
7.419	Tree and Root Pruning

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7.401 LANDSCAPING FOR TERRESTRIAL ZONE AND WETLAND ZONEA. Work Included

Under these items, the Contractor shall furnish all labor, materials, equipment and services necessary for the proper execution of all landscaping work, as specified herein and as shown on the Contract Drawings, including all incidental and appurtenant work required for a complete job. In addition, the contractor will also furnish and deliver Permanent Seed Mix as directed by the Engineer.

B. General Requirements1. Reference Standards

- a. American Association of Nurserymen, Inc., (American National Standards Institute) Nursery Stock (Z60.1)
- b. American Joint Committee on Horticultural Nomenclature Standardized Plant Names.
- c. A Checklist of New York State Plants, Contributions to a Flora of New York State, Checklist III, Bulletin #458, Richard S. Mitchell, State Botanist, New York State Museum, 1986.
- d. A Comparative Flora of Staten Island, 1879 - 1981, Buegler and Parisio, Staten Island Institute of Arts & Sciences.

C. Quality Assurance

1. Source Quality Control:

- a. If private nursery sources are used, they must be within a 250-mile radius of the planting site. All specified plants shall have also been grown in the same USDA climatic zone as that of the planting site.

All seed and original stock material for herbaceous plants shall have been collected from locally adapted ecotypes within a one-hundred mile radius of the project site. Plant material may have to be contract grown in order to meet this requirement.

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No substitutions of specified plants will be accepted without prior approval of the Engineer or his/her duly authorized representative.

- b. General. Ship landscape material with certificates of inspection when required by governmental authorities. Comply with governing regulations applicable to landscape material.
 - c. Packaged Material. Package standard products with manufacturer's certified analysis. For other material, such as topsoil, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agricultural Chemists, wherever applicable, or as further specified.
 - d. 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 75% Pure Live Seed minimum.
2. Trees and plants shall be specified as in the Contract Documents. Nurseries which collect plants from the wild shall be rejected. No substitutions shall be permitted, except as authorized in writing by Engineer. If specified landscape material is not obtainable, submit proof of non-availability to Engineer, together with proposal for use of equivalent material. All plants specified within this Contract are native to the State of New York. Species native to this region, but not listed as native within A Checklist of New York State Plants or A Comparative Flora of Staten Island, may be accepted on a case-by-case basis.
 3. The Contractor shall provide trees and plants of quantity, size, genus, species and variety shown and scheduled in the Contract Documents for landscape work and complying with recommendations and requirements of ANSI Z60.1 "American Standard for Nursery Stock". The Contractor shall provide healthy, vigorous stock, grown in a recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae and defects such as knots, sun-scald, injuries abrasions, or disfigurement.
 4. All plants furnished under this Item shall be true to name. Plant names shall agree with the nomenclature of Standardized Plant Names as adopted by the American Joint Committee on Horticultural Nomenclature, 1942 Edition. Size and grading shall

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conform to those of the American Association of Nurserymen. All wetland plants shall come from Staten Island stock or within 250-mile radius of Staten Island.

5. Certified analyses by a recognized laboratory shall be submitted by the Contractor for approval by the Engineer for topsoil before delivery to the site. Analyses must include mechanical analysis, magnesium, nitrogen, potassium, and phosphorus levels, soluble salts, pH and organic matter. Standards and formatting for topsoil analyses shall conform to those of Cornell Cooperative Extension of Nassau County. Associated costs and additional guidelines for topsoil analyses shall be as specified under DETAILED SPECIFICATIONS FOR TOPSOIL FOR RESTORED AREA.
6. Inspection:
 - a. The Engineer shall inspect trees and shrubs at place of growth before planting, for compliance with requirements for genus, species, variety, size and quality. Contractor shall be responsible for all inspection costs beyond a 50-mile radius from New York City.
 - b. Plant 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.
 - c. The Engineer retains the right to further inspect trees for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. The Contractor shall remove rejected trees immediately from project site.
 - d. Tagged samples of plant materials shall be delivered to the site and planted in locations approved by the Engineer. These tagged samples shall be maintained, protected and used as standards for comparison with the plants furnished for the work.
 - e. The Contractor shall be responsible for all certificates of inspection of plant material that may be required by Federal, State or other authorities to accompany each shipment of plants. On arrival, the certificates shall be filed with the Engineer. The Engineer shall receive a copy of each

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shipping invoice immediately after the delivery has arrived at the job site.

D. Submittals

The General Contractor shall submit the following information (as listed in 1. through 4.) for approval within ten working days following the date in the Notice to Commence Work:

1. Subcontractors. Subcontractors proposed for landscaping and associated restoration and site work must be approved by the Engineer prior to start of work. The Contractor shall submit at least three (3) alternative Subcontractors to the Engineer for review and approval. The Subcontractors proposed shall be evaluated on the following criteria, prioritized in descending order:
 - a. The Contractor shall submit a minimum of three (3) projects similar in scope and type within the last five years whereby the Contractor was directly responsible for the installation, restoration and maintenance of native habitats and wetlands. References and xerographic reproductions of photographs of the projects shall be submitted. Projects shall not be more than five years old.
 - b. Demonstrated capacity to accomplish the work in the required time including qualification of experienced foreman and key personnel.
 - c. Experience in digging and transplanting field stock.
 - d. Experience with City agencies, such as the Department of Parks and Recreation and HPD, and other organizations such as Central Park Conservancy, Botanic Gardens, and the Port Authority.
 - e. Other references or experience deemed appropriate to obtaining approval.
2. List of growers/nurseries.
3. Certified arborist or nurseryman, experienced in tree pruning and removal.
4. List of all materials and certificates specified within this Item. The General Contractor shall submit the following information (as listed in 5 through 8) prior to construction:

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5. Certificates:
 - a. All necessary State, Federal and other inspection certificates as may be required by law.
 - b. Two (2) copies to the Engineer of manufacturers' or vendors' certified analysis for soil treatments and fertilizer materials shall be submitted with samples.
 - c. Certification and guarantee that all plant material is true to name and in conformance with these specifications.
 - d. The invoice or a written statement showing the size and grade of materials received or shipped, together with the source and health of the plant material and verification that balled and burlapped plants were sprayed with an anti-desiccant within 48 hours prior to digging. No plants shall be accepted that have been collected from property other than that owned or leased by a nursery.
 - e. Certification that all herbaceous plant material was grown from seed or stock collected from locally adapted ecotypes within a one-hundred mile radius of the project site.
6. **Planting Schedule.** Submit proposed planting schedule within one month of official Notice to Commence Work, indicating dates for each type of landscape work during normal seasons and as specified in the Contract for such work in area of site. Included shall be a schedule of nursery visits for the Engineer to tag plant material. Correlate from date of substantial completion. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.
7. **List of equipment, methods of operation, and maintenance plant, including methods for protection of existing vegetation.**
8. **Manufacturer's Literature.** Manufacturer's literature for all materials furnished shall be submitted with samples of same.
9. The Contractor is required to perform a separate germination test on the seed mixes to be used on this project prior to submitting the seed mix and supplier. The results of the 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

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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. There shall be no exceptions.

10. The Landscape Subcontractor shall submit a watering and weeding plan and maintenance schedule prior to the installation of plant material, to be approved by the Engineer or Restoration Specialist. The plan shall include proposed methods of watering and weeding, including but not limited to tree gators (bags), sprinklers, drip hoses, irrigation, tanker vehicles and hand watering, etc., as well as manual weeding and weeding tools. No additional payment will be made for watering and weeding during installation and during the three year guarantee period.

The approved plan and schedule do not relieve the Contractor in any way from any aspect of the replacement of dead plant material. The Landscape Subcontractor may alter the maintenance schedule based on weather and field conditions.

E. Product Delivery, Storage and Handling

1. Delivery of Materials:
 - a. Packaged Materials. Deliver packaged materials in unopened bags or containers, each bearing the name, warranty, and trademark of the producer and the composition, analysis and the weight of the material.
 - b. Trees and Plants. The Contractor shall provide trees and plants of the stock type and quantities shown on the Contract Drawings. Do not prune prior to delivery unless otherwise approved by the Engineer. Do not bend or bind-tie trees or plants in such a manner as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery, and insure that all balled and burlapped stock, container stock, tube stock, and/or bare root material is handled properly and is not dropped.
 - c. All plant materials shall be protected from drying out and from wind damage during delivery.
 - d. The Contractor shall deliver trees and plants after preparations for planting have been completed and plant immediately. If planting is delayed more than 6 hours after delivery, set trees and plants in shade, protect from wind,

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weather and mechanical damage, and keep roots moist by covering with mulch, burlap or other acceptable means of retaining moisture. Water as necessary.

- e. The Contractor shall not remove container grown stock from container until planting time.
- f. Material should be planted in the ground immediately after delivery to site. Plants should be covered with damp-not wet-leaf compost while awaiting ground installation. Do not allow the plants to dry out or freeze.
- g. Fertilizer delivered to the job site shall be in original, unopened containers bearing the manufacturer's chemical analysis and essential information. Fertilizer containers shall be protected from exposure to precipitation and direct sunlight.
- h. All materials shall be stored in upland areas that are protected from weather.

Seed shall be clean and fresh and delivered to the site in the original, unopened bags showing the net weight, composition of 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 9 months.

F. Job Conditions

Terrestrial and Wetland Buffer Zone Plantings: Unless otherwise directed by the Engineer, evergreen material shall be planted and transplanted from April 1st to May 15th and from September 1st to October 15th. Deciduous material shall be planted and transplanted from March 1st to May 30th and from October 15th to December 1st. Container-grown herbaceous material shall be planted and transplanted from March 1st to May 30th and from August 15th to September 15th (SEE PLANTING SCHEDULE). Perform actual planting when conditions are suitable. No plant material shall be planted when the ground is frozen or in excessively moist condition. All material labeled as fall planting hazard shall be installed during the spring only. Notify the Engineer before proceeding with any planting operations.

Wetland Plantings:

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1. **Time of Planting and Transplanting.** All wetland plantings shall be installed in time frames indicated under the above Terrestrial and Wetland Buffer Zone Planting section. Perform actual planting when conditions are suitable. No plant material shall be planted when the ground is frozen or in excessively moist condition. Notify the Engineer before proceeding with any planting operations.
2. **The Contractor shall proceed with and complete landscape work as rapidly as portions of site become available, working within seasonal limitations for each kind of landscape work required.**
3. **Utilities.** The Contractor shall determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is approved by the Engineer.
4. **Excavation.** When conditions detrimental to plant growth are encountered, such as rubble fill, adverse draining conditions, or obstructions, notify the Engineer.
5. **Preservation and Restoration of Existing Trees and Shrubs.**
 - a. **In order to avoid surface and subsurface root damage and soil compaction, the Contractor shall not be permitted to stockpile materials of any nature under the drip line of existing trees and shrubs. This directive shall apply to all areas within or outside the Contract limit line.**
 - b. **The Contractor shall assume the responsibility for any remedial work such as root and top pruning required and/or necessary to prevent loss of plant material when this article is violated or when trees or shrubs are injured by construction equipment.**
 - c. **Compensatory pruning and fertilizing of existing trees and shrubs shall be performed to compensate for damage of roots incurred. Fertilize in areas around undamaged roots only and not adjacent to the trunk or main stem. Fertilizer shall be applied in the fall unless otherwise approved by Engineer.**
 - d. **Tree pruning shall be performed In accordance with Specification 7.419 Tree and Root Pruning.**
 - e. **No separate payment will be made for fertilizing and pruning of trees and shrubs in stockpile areas or when trees or shrubs are injured by construction equipment, but the cost thereof**

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will be deemed to be included in the various prices bid for the items for which such pruning and fertilizing are necessary.

- f. No existing trees, shrubs or herbaceous plants shall be removed, except as specifically required by this Contract or as specified on Contract Documents, or as specifically approved in writing by the Engineer.
- g. Any areas or items of existing landscape which are removed or damaged shall be replaced by the Contractor at no additional cost to the City. The Contractor shall match the existing condition prior to damage or as directed by the Engineer.
- h. All existing landscape features including trees, shrubs, perennial, meadows, lawns, wetlands, paving, walls, stairs, etc. shall be protected by the Contractor, utilizing methods approved by the Engineer prior to start of work.

G. Guarantee

- 1. Landscape Guarantee and Replacements
 - a. Guarantee. All landscaping work shall have a replacement guarantee for a period of three (3) years beginning at the date of acceptance of the Landscaping work or the date of substantial completion, whichever is later, and shall be considered as included under monies shown within the guarantee provisions of Schedule A.
 - b. Operations. The Contractor shall, for a period of three (3) years, cultivate, weed, mulch, prune, and water all trees, shrubs, herbaceous plants, vines permanent seeded areas under this Contract, to the satisfaction of the Engineer. The Contractor shall replace, according to the original specifications, any plant material which is dead or in a dying condition at the request of the Engineer. The Engineer shall be the sole judge as to the condition of the plants. The guarantee and maintenance applies to all planted and grassed areas, meadows, paved and other landscaped areas.
 - c. Replacement. Any plant material that is dead or not showing satisfactory growth, as determined by the Engineer, shall be promptly removed and replaced by the Contractor during normal planting season specified in Section 7.401.2E. Initial

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replacement of dead material and the repair of bare areas will take place one year following the acceptance of plant material. The replacement shall be of the same variety, size and character as specified for the original planting. Unless a written waiver of this clause is issued, under the terms of the guarantee, replacement plants shall be chosen only by the Engineer.

At the end of the guarantee period, and upon written request, an inspection will be made by the Engineer. If mortality exceeds ten percent or if bare areas occur, the Contractor shall replace plant material.

H. Materials

1. Topsoil

- a. Topsoil from site stripping shall be used if the material meets specifications listed in 7.403. A soil test(s) shall be made at Contractor's expense to determine if the specifications for all the tests listed in (7.403) have been met. A soil test shall be required and shall serve as a representative analysis for every 200 cubic yards of material utilized.
- b. Additional topsoil shall be furnished from sources off the Contract site when existing topsoil is not sufficient. Material shall consist of natural loam topsoil, free from subsoil, obtained from an area which has never been stripped. Topsoil shall comply with the requirements of Specification section 7.403.

2. Fertilizer

Fertilizer shall be provided as indicated on the Contract Drawings: Osmocote, granular, slow-release in the specified time frame releases and analyses. Fertilizer shall be furnished in standard containers, with name, weight and guarantee analysis of contents clearly marked thereon. Appropriate containers to disperse specified amounts of fertilizer into planting holes shall be supplied and used by the Contractor.

3. Mycorrhizal Inoculants

- a. Mycorrhizal inoculants shall be used in all tree and shrub planting operations in all areas receiving topsoil from off-

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site sources, or stripped topsoil stockpiled in excess of one year.

- b. The inoculants for trees and shrubs shall be "Mycor Tree Saver" by Plant Health Care, Inc.; Rhizanova Tree Transplant, by Becker Underwood, Inc.; "DIEHARD" by Horticultural Alliance; or approved equal. The inoculants shall contain fresh, live and viable spores of both endo (VAM) and ecto (Pt) mycorrhizal fungi. All inoculants shall be delivered in sealed containers or packages of the Vendor, listing the weight, content, date of packaging and name of Vendor.
- c. The inoculants for herbaceous plants and grasses shall be Mycor Plant Saver by Plant Health Care, Inc.; "DIEHARD" by Horticultural Alliance; "mycorrhizaROOTS Soluble" by Lebanon Turf; or approved equal. The inoculants shall contain fresh, live and viable spores of both endo (VAM) and ecto (Pt) mycorrhizal fungi. All inoculants shall be delivered in sealed containers or packages of the Vendor, listing the weight, content, date of packaging and name of Vendor.
- d. The inoculants shall be stored in unopened containers in a cool, dry location. All containers must be inspected by the Engineer prior to opening. Any inoculants dated eighteen (18) months or more prior to the date of intended use shall not be used. Any inoculant that has been in a wet condition shall not be used. Any inoculant rejected by the Engineer shall be removed from the site.
- e. For trees and shrubs, the Contractor shall incorporate the inoculant into the top eight inches (8") of the topsoil mix used in the planting operations described in Section 7.403 and as per the manufacturer's instructions. The amount of inoculant used at each plant shall be based on the plant's size - see manufacturer's instructions. For herbaceous plants, the Contractor shall place the inoculant into each planting hole as per manufacturer's application rate and project plans.
- f. The Contractor shall not apply fungicide to any areas receiving inoculant for a minimum of two weeks following the planting operations.

4. Plant Material

- a. The Contractor shall furnish all plant material shown. Plant material must be true to name and size and conform with the following standards:

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- i. American Joint Committee on Horticultural Nomenclature, Standardized Plant Names (Published by Mount Pleasant Press J. Horace McFarland Company, Harrisburg, PA.).
 - ii. American Association of Nurseryman, "Horticultural Standards" (Published by American Association of Nurserymen, Inc., 635-636 Southern Building, Washington, D.C.).
- b. Nursery grown plants shall mean plants propagated by seed, division, tissue culture or cloned from existing stock at a nursery, which are healthy, vigorous plants, cultivated in accordance with sound horticultural practice. All plants shall be nursery grown unless collected from natural areas owned or leased for that purpose by the nursery. All plants shall have been grown under the same climatic conditions as those of the planting site. All herbaceous plants shall come from seeds or stock collected within a one-hundred mile radius of the project site. Only those nurseries within a 250-mile radius of the planting site will be accepted as plant sources. In some cases plant material may be obtained outside the 250-mile radius on a case-by-case basis.
 - c. All plants and all balled and burlapped plants shall be freshly dug; neither heeled-in nor plants from cold storage will be accepted. All plants shall have been transplanted or root pruned at least once in the past three years.
 - d. All plants shall conform to the measurements specified in the plant list on the Contract Drawings. All plants shall be typical of their species and shall have a normal, healthy habit of growth and be of first quality, sound, vigorous, well-branched and densely foliated. Plants that meet the requirements specified in the plant list, but that do not possess a normal balance between height and spread will not be accepted. No damaged or diseased plants will be accepted.
 - e. All deciduous trees shall be well-branched and furnished to the ground. There shall be no abrasion of the bark, no fresh cuts of limbs over 1-1/4" which have not completely calloused over. A heavy fibrous root system is essential. Refer to Plant Schedules on the Contract Drawings for further specifications.

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- f. All evergreen trees shall be heavy, symmetrical plants well-furnished to the ground. They may be multiple-stemmed. All evergreen trees must be free from winter injury. A heavy fibrous root system is essential.
- g. Trees 4" caliper or less shall be calipered six inches above ground. Trees greater than 4" caliper shall be calipered one foot above ground.
- h. All trees to be tagged on north side of tree for proper orientation when planting.

5. Mulch

Mulch shall be organic mulch free from deleterious materials and suitable for top dressing of trees, shrubs or plants and shall be shredded hardwood bark, decayed hardwood chips, leaf mold, pine straw, partially decayed leaves, cottonseed hulls, peanut hulls or other organic products. Mulch must be aged at least one year, should not contain elm wood chips, or be from diseased trees. No shredded bark pieces shall be greater than 3" in length and 13" in width. Mulch for seeded areas shall be clean, seed-free salt hay. Mulch shall be free of roots or other parts of invasive exotic plants that may take root in restored area.

6. Compost

Compost having the general properties of humus shall contain organic matter with no admixture of refuse or material toxic to plant growth and shall be completely decomposed and free from deleterious materials such as a glass, paper, plastics, metals, etc. Compost shall be from Long Island Compost, Islip, NY; "Earthlife", by Casella Organics, or "Nature's Choice Compost" by Nature's Choice Corp., Union, NJ, or approved equal.

7. Materials for Anchoring, Staking, Guying, Wrapping

- a. Stakes. The Contractor shall provide straight, sound cedar stakes, 2 x 2-1/2 inch diameter (50 x 50 mm or 63 mm diameter) in size.

In natural areas, where wind-disturbance is unlikely Engineer will determine if stakes are necessary. If it is determined that staking is required, a modified staking system shall be used. The modified stakes shall be shorter than conventional stakes, and shall protrude 18 inches above

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the finished grade. Stakes shall be anchored and fastened in the same manner as in conventional staking.

- b. Tree guys. The Contractor shall provide guys of 3/4" woven polypropylene fabric, such as "Arbor-Tie" or approved equal. Each end shall be coiled tightly, with enough slack left in guy so as to allow slight movement of tree trunk. Guying shall be performed under the direct supervision of the Engineer.
- c. Wrapping Material. The Contractor shall use standard nursery tree wrapping paper, or burlap manufactured for wrapping tree trunks. Burlap shall be made of jute. Twine for tying shall be lightly tarred sisal (lath) yarn.

8. Topsoil Mix

The topsoil mix shall be a mixture of one part compost, and two parts of topsoil. Topsoil mixed on-site must be tested by Contractor and have pH of 5.5 - 6.5. Ericaceous plantings may require a lower pH. Where site conditions such as heavy clay soils exist, the Engineer shall determine a mix incorporating a percentage of the existing soils.

9. Temporary Seed Mixtures

Soil stockpiles and cleared and graded areas shall receive Ryegrass (annual or perennial).

Nurse/Cover seed shall be certified "Aroostook" winter rye (cereal rye).

10. Permanent Seed Mixture

Seed mixture shall be as specified in the Contract Drawings unless otherwise directed by the Engineer. The FACW Wetland Meadow Mix shall be manufactured by Ernst Seed Co., , or approved equal.

Seed Mixtures – Permanent seeding shall be the Staten Island Native Wildflower Meadow Seed Mix, or the FACW Wetland Meadow Mix, as shown on the following table:

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Staten Island Native Wildflower Mix

Common Name-Wildflowers	Scientific Name	Percentage
Black Eyed Susan	Rudbeckia hirta	20
Switchgrass	Panicum virgatum	10
Virginia Wild Rye	Elymus virginicus	10
Indiangrass	Sorghastrum nutans	5
Thin Leaved Coneflower	Rudbeckia tribolia	5
Wild Blue Lupin	Lupinus perennis	4
Rough Stem Goldenrod	Solidago rugosa	4
Joe Pye Weed	Eupatorium fistulosum	4
Wingstem	Verbesina alternifolia	4
Wild Bergamont	Mondard fistulosa	4
Sneezeweed	Helenium autumnale	4
Heath Aster	Aster pilosus	4
New England Aster	Aster novae-angliae	4
Smooth Blue Aster	Aster laevis	4
Blue Vervain	Verbena hastata	4
Common Milkweed	Asclepias syriaca	2
Butterfly Weed	Asclepius tuberosa	2
Eastern Columbine	Aquilegia canadensis	2
Showy Tick Trefoil	Desmodium canadense	2
Forest Sunflower	Helianthus decapetalus	2

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Staten Island FACW Wet Meadow Seed Mix

Common Name - Wildflowers	Scientific Name	Percentage
Virginia Wild Rye	<i>Elymus virginicus</i>	20
Fox Sedge	<i>Carex vulpinodea</i>	15
Bottlebrush Grass	<i>Elymus hystrix</i>	10
Deertongue	<i>Panicum clandestinum</i>	5
Pennsylvania Smartweed	<i>Polygonum pennsylvanicum</i>	5
Riverbank Wild Rye	<i>Elymus riparius</i>	5
Switchgrass	<i>Panicum virgatum</i>	5
Black Eyed Susan	<i>Rudbeckia hirta</i>	5
Soft Rush	<i>Juncus effusus</i>	5
Common Milkweed	<i>Asclepius syriaca</i>	5
Pennsylvania Sedge	<i>Carex pennsylvanicum</i>	2
Blue Vervain	<i>Verbena hastata</i>	2
White Snakeroot	<i>Eupatorium rugosum</i>	2
Spotted Joe Pye Weed	<i>Eupatorium maculatum</i>	2
Whorled tickseed	<i>Coreopsis verticillata</i>	2
White Wood Aster	<i>Aster divaricatus</i>	2
Heart Leafed Aster	<i>Aster cordifolius</i>	2
Path Rush	<i>Juncus tenuis</i>	2
Swamp Sunflower	<i>Helianthus angustifolius</i>	2
Showy Tick Trefoil	<i>Desmodium canadense</i>	2

11. Erosion Control Mat (Blanket)

The erosion control fabric utilized at BMPs and shown on the Contract Drawings shall conform to Detailed Specification 7.705 Erosion Control Mat.

I. Execution

Installation/Application/Performance For Terrestrial and Wetland Buffer Zone Plants

1. **Workmanship.** The Contractor shall complete all work in the best manner, so that the work as a whole is of uniform quality and appearance. The Contractor shall conform to the requirements specified hereafter.
2. **Preparation.**
 - a. Areas described and shown on plans shall be rough graded with suitable local fill to (maximum) four (4) inches below

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the finished surface, topsoiled, fine graded, prepared for planting and landscaped.

- b. Subgrade shall be kept free of masonry, concrete, metal waste materials, and debris.
 - c. Remove stones over 1-1/2 inches in any dimension, as well as sticks, rubbish and other extraneous matter.
 - d. No topsoil mix is to be placed until the subgrade is approved by the Engineer.
 - e. For planting beds, spread topsoil mix to minimum depth required to meet lines, grades and elevations shown on the Contract Drawings, after light rolling and natural settlement.
 - f. The planting beds and pits shall be worked up well, and shall be free of other vegetation and large clods of soil.
 - g. Apply fertilizer at rate specified in Contract Drawings during planting and seeding operations. Do not use fertilizer for wetland plants or in excessively wet areas.
3. Delivery: Plants shall be packed, transported, and handled with utmost care to insure adequate protection against injury. When transported in closed vehicles, plants shall receive adequate ventilation to prevent sweating. When transported in open vehicles, plants shall be protected by tarpaulins or other suitable cover material. All bare root plants shall be adequately protected from drying out and immediately after inspection shall be heeled in moist soil. Balled and burlapped plants shall be set on the ground and the ball covered with soil. Until planted, all material shall be properly maintained and kept adequately moist, to the satisfaction of the Engineer.
4. Inspection: Inspection may be made before digging if the Engineer directs, but no plant material shall be planted by the Contractor until inspected by the Engineer at the site of the work. Plant material will be rejected if delivered with broken or damaged root balls, or if damaged on site by rough handling. All rejected material shall be immediately removed from the site and replaced with acceptable material at no additional cost to the City. Final inspection shall be made upon completion of the Contract.
5. Installation.

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a. Planting Operations.

1. Layout: All trees, shrubs and herbaceous shall be laid out in random and naturalistic arrangements, as specified in the Contract Drawings unless otherwise directed by the Engineer. All plant and planting area locations shall be staked prior to planting by the Engineer. Place no plantings within two (2) feet of pavements or structures, unless otherwise indicated.
2. Loosen subsoil/subgrade to a depth of six (6) inches prior to topsoil placement so that the topsoil and subsoil layers don't mix. Loosen subsoil with rototiller, backhoe or discer. The soil-loosening operation shall be conducted in such a way as to back its way out of the site. After this, no more heavy machinery shall be allowed on the planting beds.
3. Rototill/cultivate soils to a depth equal to the depth of the root ball and two times the diameter of the root ball. Set the tree/shrub on the undisturbed solid ground in the center of the area.
4. Obstructions Below Ground: Remove any rock, rubble, masonry, concrete, metal, stones over one inch or other underground obstructions to the depth necessary to permit proper planting.
5. Disposal: Remove and dispose of all excess excavations and unsuitable materials. Dispose in accordance with all local laws and regulations at Contractor's cost.
6. Apply topsoil, utilizing small equipment that does not compact soil.
7. Plant Beds: All plant material shall be planted in existing on-site and/or locally available topsoil, except for shallow plantings installed within the specified four-inch (minimum) topsoil layer.
8. Bare root material shall be adequately protected from drying out and immediately heeled in after inspection. The bundles of heeled-in plants shall be set upright on the ground, covered with mulch, and kept adequately moist until the time of installation.

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Until the time of planting, all plant material shall be stored in an approved location, securely fenced and maintained, to the satisfaction of the Engineer, at no additional cost to the City. All plants not planted immediately shall be watered as necessary to maintain optimal health until planting.

9. Setting Plants: Plant all plants to the same depth as their place of growth, unless otherwise directed. Center the plants in their planting pits. Set in the natural upright position at such a level that, after settlement, a normal or natural relationship of the crown of the plant with the ground surface shall be established. Be careful not to exert any pressure that will damage any portion of the plant.
 10. Topsoil mix shall be lightly tamped around the base of all plants and trees. Avoid compacting the soil. As clay soils are particularly prone to compaction, especially if worked when wet, transplant into clay soils when they are not saturated to the greatest extent possible. Do not leave plants exposed to sun or wind prior to planting. Take special care to avoid desiccation of fibrous-rooted plants.
 11. The Contractor shall be liable for any damage to property caused by planting operations and the Contractor shall, without any additional cost, restore to original condition or replace all trees, plant beds, lawns, meadows and all construction disturbed or damaged in performing the work of this Contract.
- b. Planting Trees and Shrubs.
1. Trees and shrubs shall be planted before herbaceous plants to avoid trampling of the smaller material. The Contractor shall properly sequence plant delivery to achieve this progression.
 2. Balled and burlapped. The roots of balled and burlapped plants shall, if not immediately planted after digging and inspection, be adequately protected by topsoil until planted in their final location. Handle balled plants so that the ball will not be loosened. After the soil has been thoroughly firmed under and around the ball, cut the burlap away from the upper

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half of the ball and adjust remaining burlap to prevent the formation of air pockets; when directed by the Engineer remove the burlap entirely. Firm the soil at 6" to 8" intervals and thoroughly settle with water. Remove all wire baskets from root balls, unless otherwise directed by the Engineer. Install mulch around trees and shrubs immediately after installation.

3. Container. Cut containers on 2 sides with an approved can cutter and remove plant from container. Set container grown stock as specified. If container grown plant is root-bound or can be easily pulled from container, plant shall be rejected. Place plant on a cushion of planting soil mixture and carefully work soil mix around roots by hand and puddle with water until the soil mix layers are completely saturated.
4. Tube stock. Plants shall be removed from tube entirely and without damage. Plugs shall have solid soil/root masses with the soil in place. Roots must appear clean and white in coloration. If plug is root-bound or can be easily pulled from tube, plant shall be rejected. Plug shall be installed in hole perpendicular with root collar and even with the surrounding grades. Plant to be firmed in to remove air pockets, then watered to full saturation.
5. Mix granular 12-14 month slow release Osmocote into the top two inches (2") of soil backfill at the rates indicated on the Contract Drawings. Apply Mycorrhizal inoculants directly to the root ball. The top of the root ball/container soil shall be level with the substrate surface. Excess substrate shall be distributed around the planting sites. No saucers shall be constructed around the planting sites with the excess substrate.
6. Mulch pits, trenches and all planted areas. Provide not less than a three (3) inch thick layer of mulch and work into top of soil and finish level with adjacent finish grades. Do not place mulch within six (6) to eight (8) inches of tree trunks, nor should the base of shrubs and other plants be covered by mulch. No

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separate payment shall be made for mulching planted areas.

7. Prune, thin out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by the Engineer, do not cut tree leaders, and remove only injured or dead branches from flowering trees, if any. Prune plant material to retain natural character.
 8. Trees shall be placed with the tags facing North. Placing the trees in the same orientation to the North as they were grown in the nursery shall serve to limit bark sun scald.
 9. Guy and stake street trees immediately after planting, as required by the Engineer. Trees planted as part of a natural area restoration must use modified staking system if deemed necessary. Stakes shall be removed after one complete growing season.
 10. Stake all trees within 20 feet of a surface water feature, so that they will not be washed away in time of flood.
6. 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.

J. Temporary Seed Mixture

1. Soil stockpiles shall be seeded with a temporary seed mixture if they will be in place for greater than 30 days. Cleared and graded areas shall also be seeded with a temporary seed mixture to temporarily stabilize them, if they will not be landscaped or planted (final) for more than 30 days.
2. Seed mixture – Temporary seeding shall be Ryegrass (annual or perennial) at a rate of 30 lbs per acre or 0.7 lbs per 1,000 sq. ft. If area is seeded during months of October and November, certified "Aroostook" winter rye (cereal rye) shall be used at a rate or 100 lbs per acre or 2.5 lbs per 1,000 sq. ft.
3. Temporary seeding shall be made within 24 hours of

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construction/disturbance. If not, the soil must be scarified prior to seeding.

4. Method of seeding – seed shall be evenly applied with broadcast seeder, drill or cultipack seeder.
5. If temporary seeding is made under favorable soil and site conditions during the optimum seeding dates (March 21 – May 20 or August 25 – October 15) mulch is not required. Any temporary seeding outside of those dates shall be mulched with salt hay mulch at a rate of 2 tons per acre (100-200 bales/acre).
6. Any area with fail to establish vegetative cover adequate to prevent rill erosion will be reseeded as soon as such areas are identified.

K. Permanent Seed Mixture

1. 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.
2. All seed materials shall be protected from drying out and from wind damage during delivery.
3. All areas shown to receive seed on Contract Drawings and all areas which are disturbed and not planted shall be seeded.
4. Seedbed Preparation – Scarify all compacted areas and remove all debris and obstacles such as rocks and stumps.
5. Do not broadcast seed by mechanical application when the wind velocity is such as to prevent uniform seed distribution.
6. Seed at a rate of 10 pounds per acre along with 10 pounds per acre of cover/nurse crop. The nurse crop may consist of annual ryegrass.
7. Time of Seeding – Permanent seeding shall be done within 15 days of final construction activities. Optimum seeding times are in the spring from March 15 – May 15 and in fall from September 15 – 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 15, mulch should be applied until the permanent seeding can be done during the recommended seeding dates.
8. Method of Seeding – Seed shall be broadcast by hand or

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mechanically using a drop-hopper. The seed shall then be sown to depths of 0-0.25" using an ATV pulling a weighted drag of the same width as the ATV, with bolts inserted every 4-6" along its width in order to open up furrows in the soil of up to 0.25" in depth. The ATV should drag the seeded area a minimum of four (4) times.

9. Following the seeding operation, 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.
10. Mulching straw of oat or wheat stalks shall be applied at a rate of 2 tons per acre (100-200 bales/acre). Hay is not acceptable due to its high weed content.
11. Acceptable seeding will be 85% coverage of the open area with the seeded species. Any area not meeting this requirement shall be reseeded with the original seed mix.

L. Final Acceptance

Trees, shrubs and herbaceous plants must be thriving. Planting beds must be evenly mulched and free of invasive nonnative plant species. Paving/landscape interface must be a smooth, crafted transition free from defects such as gaps, sharp edges or sudden level changes.

M. Final Cleanup

At time of final inspection of work, and before final acceptance, clean any paved areas that are dirty or stained due to work of this Section by sweeping or washing, and remove any defacements or stains. Remove construction equipment, excess materials and tools. Remove from site any debris and dispose of off-site, in accordance with all local laws, and at the Contractor's expense. The Contractor shall also cut all perimeter grass and weeds before final acceptance.

N. Wetland Plantings:

1. Installation

The Contractor shall complete all work in the best manner, so that the work as a whole is of uniform quality and appearance. The Contractor shall conform to the requirements specified hereafter. Plant material scheduled for planting in coconut fiber logs shall also be rooted and potted in coconut fibers, and not in potting soil. This

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requirement shall serve to safeguard against plants floating out of coconut fiber logs due to the washing away of potting soil.

- a. At the elevations described and shown on the plans, the areas shall be fine graded, prepared for planting and landscaped.
- b. Subgrade shall be kept free of waste material and debris. Subgrade shall be compacted prior to topsoil application at the Engineer's direction.
- c. Remove stones over 1-1/2 inches in any dimension, as well as sticks, rubbish and other extraneous matter.
- d. The planting areas shall be worked up well, and shall be free of other vegetation and large clods of soil.
- e. Install erosion control mat.
- f. Apply fertilizer at rate specified in Contract Drawings during planting and seeding operations.

2. Erosion Control Blankets

- a. Center a blanket in the bottom of the wetland area and anchor the erosion control blankets in a minimum 8" x 8" slot using five evenly spaced staples. Unroll blankets carefully in the direction of water flow, being careful to place blankets loosely and in full contact with the soil.
- b. Overlap blanket edges approximately 4" with downstream edges over upstream edges.
- c. Staple blankets using approximately 3 staples per square yard.
- d. Overlap blanket ends 6" in a minimum 8" x 8" check slot, upper blanket over lower blanket and staple using five evenly spaced staples.
- e. Cut excess blanket with scissors and anchor at the entrance to the weir/micro pool in a minimum 8" x 8" check slot with five evenly spaced staples.
- f. Blanket shall not float or bubble anywhere after wetland is inundated with water.

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3. **Planting Operations**
- a. **Layout:** All plants shall be laid out in random and naturalistic arrangements, as specified in the Contract Drawings unless otherwise directed by the Engineer. All plant and planting area locations shall be staked prior to planting by the Engineer. Place no plantings within two (2) feet of pavements or structures, unless otherwise indicated.
 - b. When planting containerized wetland plants, care shall be taken so as not to set the plants in water where there is in excess of 3" - 4" of water between the top of plant and the water surface. When planting dormant wetland plants, care shall be taken so as not to set the plants in water where there is in excess of 12" - 14" of water between the top of plant and the water surface.
 - c. When planting containerized or tube wetland plants, care shall be taken so to set the plants in the water regime noted on the Contract Drawings plant schedule.
 - d. Rototill/cultivate soils to a depth equal to the depth of the root ball and two times the diameter of the root ball. Set the tree/shrub on the solid ground in the center of the area.
 - e. **Obstructions Below Ground:** remove any rock, rubble, masonry, concrete, metal, stones over one inch in diameter or other underground obstructions to the depth necessary to permit proper planting.
 - f. **Disposal:** Remove and dispose of all excess excavations and unsuitable materials. Dispose in accordance with all local laws and regulations at Contractor's cost.
 - g. The storm sewers tributary to BMPs should not be put into service for 6 to 8 weeks after completion of the associated wetland plantings. This will permit the wetland plantings to establish themselves.

O. **Measurement and Payment**

The quantity to be measured for payment under this section shall be the total amount of trees, shrubs, herbaceous plants and seeded areas furnished, planted and maintained.

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The contract price per unit for Landscaping Work shall be as indicated on the BID SCHEDULE OF PRICES Item Nos. BMP-7.401-A1 through BMP-7.401-J inclusive. The price bid shall be a separate unit price per tree, shrub and herbaceous plant specified within the Contract Drawings, and shall include the costs of all excavating and preparing planting pits and beds, adding soil amendments, furnishing plants, digging, inspecting, planting, pruning, staking, guying, anchoring, wrapping, mulching, fertilizing, furnishing seed, seeding, liming, discing, raking, tilling harrowing, mowing, material, and maintaining all plant material and seeded areas. The price bid shall also include the costs of all rough and fine grading, all specified soils necessary and required for the satisfactory completion of all landscaping work and all other work incidental thereto in accordance with the plans and specifications to the satisfaction of the Engineer.

The contract price per square foot of seeding shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.401-I.

PLANT MATERIAL SUMMARY FOR LANDSCAPING WORK

<u>Item</u>	<u>Description</u>
BMP-7401-C inclusive	Canopy Trees whips - 5'-6'
BMP-7.401-H inclusive	Shrubs
BMP-7.401-I inclusive	Seeding
BMP-7401-J inclusive	Herbaceous Plants – Plugs

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 Landscaping and Restoration Work
**Terrestrial and Wetland Zone
 Planting, Transplanting and Seeding Schedule**

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	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Evergreen Material				4/1	5/15				9/1	10/15		
Deciduous Material			3/1		5/30					10/15	12/1	
Container-Grown Herbaceous Material			3/1		5/30			8/15	9/15			
Permanent Seeding			3/15		5/15				9/15	10/15		

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7.403 TOPSOIL FOR RESTORED AREAA. Description of Work

Under this item, the Contractor shall prepare topsoil areas and shall furnish, place and incorporate topsoil in accordance with the plans and specifications or as directed by the Engineer.

The Contractor shall be liable for any damage to property caused by topsoiling operations and all areas of construction disturbed shall be restored to their original condition to the satisfaction of the Engineer.

B. Material

Material shall consist of natural loam topsoil, free from subsoil. It shall be removed to a maximum depth of one (1) foot, or until subsoil is encountered. Topsoil shall be of uniform quality, friable, free from hard clods, stiff clay, hard pan, partially disintegrated stone, stones larger than one (1) inch diameter, 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 topsoil material.

All topsoil shall be tested by a New York State Cooperative Extension office or by an approved analytical laboratory with 3 years documented history of soil testing for state, city or county projects.

Topsoil from site stripping shall be tested prior to stripping. Soil test shall be performed per five (5) acres and at the extremes of elevations. After site topsoil has been stripped, stockpiled, and amended per soil test results, the stockpiled topsoil shall be tested again. For imported and stockpiled topsoil, soil tests shall be required and shall serve as a representative analysis for every 200 cubic yards of material utilized.

Topsoil shall comply with the following requirements: No topsoil shall be delivered in a frozen or muddy condition.

1. Organic Content: Topsoil shall contain a minimum four (4) percent organic matter and a maximum of fifteen (15) percent 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 acidity range shall be pH 5.5 to pH 6.5 inclusive.

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2. Nutrient Content: Magnesium, nitrogen, potassium, phosphorus levels, and soluble salts.

<u>Range</u>		<u>Nutrient</u>
4	– 8 (PPM)	Phosphorus (P)
66	– 100	Magnesium (Mg)
115	– 164	Potassium (K)
0.36	- 0.75	Boron (B)
0	– 49	Iron (Fe)
0.5	– 1.0	Zinc (Zn)
85	– 120	Nitrogen (N)

Soluble salts shall be less than 2.5 millimhos.

3. Total Petroleum Hydrocarbon Content: Topsoil shall be tested for total petroleum hydrocarbons (TPH) by the Gravimetric-Hexane Method, as approved by the US Environmental Protection Agency. Topsoil shall contain less than 150 ppm total petroleum hydrocarbons. All soil testing positive shall be rejected and removed from the site.
4. Sieve Analysis: (By Wash Test, ASTM Designation C117)

The mechanical analysis of the soil shall be as follows:

Passing 2" sieve 100%
 Passing 1" sieve 95% to 100%
 Passing #4 sieve 90% to 100%
 Passing #100 sieve 30 % to 60%

5. Electrical Conductivity: Topsoil should have a maximum electrical conductivity of 1,000 micromhos/centimeter.
6. Invasive, Nonnative Plant Species: Topsoil shall be free of invasive nonnative plant propagules or if present, topsoil shall be sterilized with documentation.

When topsoil 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.

The Contractor shall at the direction and discretion of the Engineer, or when quantities exceed two hundred (200) cubic yards, furnish a certified report of an approved analytical chemist showing the analysis of representative samples of the topsoil which he/she proposes to use. All samples are to be

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taken by the Engineer and delivered to the laboratory. The price bid shall include inspection and laboratory charges. No topsoil 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 which does not, in his/her opinion, meet these specifications.

The Engineer reserves the right to reject topsoil in which more than sixty (60) percent of the material passing the No. 100 U.S.S. mesh sieve consists of clay as determined by the Buoyoucouous Hydrometer or by the decantation method. All percentages are to be based on dry weight of sample. If the Engineer directs, topsoil which varies only slightly from the specifications may be made acceptable by such corrections as the Engineer deems necessary.

C. Preparation of Topsoil Areas

Before any topsoil is placed, the subgrade shall be graded to a smooth, uniform surface, parallel to and below finished grade, the depths of which are shown on the plans or as directed by the Engineer. The subgrade surface shall be compacted with an approved roller weighing approximately five hundred (500) pounds. Hollows, depressions and gullies shall be filled with acceptable material free from stones over one (1) inch in diameter, cinders, rubbish and other unsuitable material. Fill which is four (4) inches or more in depth shall be compacted to the satisfaction of the Engineer.

All bumps, mounds, and ridges shall be cut down to subgrade elevations as shown in the Contract Drawings. All areas of the subgrade that are not in a friable condition shall be loosened to a depth of twelve (12) inches as directed by the Engineer. All surplus material and debris shall be removed and disposed of as directed by the Engineer.

D. Spreading

Topsoil for upland areas shall be spread and compacted to the overall depth of that which exists within the restoration area or to three (3) inches, whichever is greater. Topsoil for wetland areas shall be spread and compacted to the overall depth of that which exists within the wetland area or to four (4) inches, whichever is greater. The contractor shall use the lightest equipment appropriate to spread and compact the topsoil. Topsoil shall not be handled when, in the opinion of the Engineer, it is too wet.

Topsoil for backfilling planting pits and planting beds shall be mixed with compost having the general properties of humus in the following proportions:

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Two (2) parts of topsoil to one (1) part of compost. They shall be thoroughly mixed by placing the compost evenly over the topsoil piles and turning the piles at least three (3) times or until thoroughly mixed to the satisfaction of the Engineer.

Topsoil mixed on-site must be tested by the Contractor and have a pH of 5.5-6.5.

The finish grade shall not be excessively compacted. Finish grade to 12" below soil surface shall be loose, friable soil and not excessively compacted to the satisfaction of the Restoration Specialist. Maximum acceptable compaction is to 83% of the standard (AASHTO) Proctor maximum dry density. Conversely, soil shall not be so loose that there is potential for extensive settlement, slumping, soil erosion, or excessive drainage. On-site compaction tests, if required, shall be a standard test such as Nuclear Density Meter, or Sand Cone, or Balloon Density performed at contractor expense. After finish grading, and prior to installation of any erosion control fabric, planting, seeding, the Restoration Specialist shall inspect extent of soil compaction. Restoration Specialist shall re-inspect extent of compaction after completion of all site work. If required, Contractor will be required to loosen top 12" of soil to the satisfaction of the Restoration Specialist.

E. Mycorrhizal Inoculants

All trees and shrubs planted in areas receiving topsoil from off-site sources or on-site topsoil stored more than one (1) year shall be inoculated with Mycorrhizal.

F. Measurement and Payment

The quantity of topsoil to be paid for under this item shall be the number of cubic yards of topsoil furnished from off-contract site sources (i.e. suppliers approved by the engineer), mixed, placed and incorporated in the completed work in accordance with the plans and specifications to the satisfaction of the Engineer, measured in trucks used for delivery, at the site of the work. The quantity of topsoil to be paid for under this item shall be measured in cubic yards in trucks used for delivery. No topsoil shall be furnished until ordered by the Engineer. (No deductions shall be made except for the volume of topsoil displaced by balls of trees, except in paved areas). Delivery ticket with name and address of vendor, date and estimated volume must be supplied to the Engineer prior to truck measurement.

The contract price per unit for Topsoil shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.403. The bid price shall be a unit price per cubic yard of topsoil, and shall include the cost of all labor, materials and equipment necessary to prepare topsoil areas, furnish, mix,

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place and incorporate topsoil and compost, and all other work incidental thereto, in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.404

RESTORATION SPECIALIST (CONSTRUCTION MONITOR)

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7.405 VECTOR, PEST AND WILDLIFE CONTROLA. Description of Work

When, in the course of construction, the Engineer deems it necessary, the Contractor shall make arrangements to immediately implement a Vector and Pest Control Program at the construction site. All work is to be performed by a Licensed Applicator, and shall comply with all NYC and NYS Department of Health requirements for Vector and Pest Control and the methods outlined below. The work shall also include the control of mosquito larvae. The work shall be performed on a periodic basis as determined by the Engineer.

The Contractor shall also make arrangements to hire a Wildlife Control Agent, licensed by the NYSDEC, for live capture and removal of muskrats and any other wildlife if the Engineer deems it necessary. The wildlife, which shall include pond life such as fish, frogs, and turtles shall be removed before full-scale construction begins. The wildlife shall be relocated off-site and upstream.

It is anticipated that once construction commences, the resident water fowl will leave the existing wetland areas. However, if the waterfowl do not leave on their own following the commencement of work in the wetland areas, the Wildlife Control Agent shall make recommendations for their removal, and shall relocate the waterfowl to another water body on Staten Island.

All work in this item shall be supervised by the Restoration Specialist.

B. Material

1. Rodent Control - Rodent control shall be done in accordance with the applicable sections of New York City Department of Transportation Standard Highway Specification 7.88 Rodent and Waterbug Pest Control.
2. Mosquito Control – As directed by the Engineer or Restoration Specialist, the licensed application shall treat stagnant water for mosquito larvae with products approved by the New York City Department of Health. These include Vectolex, Altosid, Vectobac, and Aquabac. Products used shall consist of the naturally occurring bacteria, *Bacillus thuringiensis*.
3. Wildlife Control – The effort to live capture and remove pond life such as muskrats, fish, frogs and turtles shall be undertaken by a

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Wildlife Control Agent, licensed by NYSDEC, employing various materials such as seines for catching fish, traps for live capture of turtles and muskrats, and possible use of electric shock to also capture fish.

C. Method

Application of rodent control shall be per the applicable section of New York City Department of Transportation Standard Highway Specification 7.88 Rodent and Waterbug Pest Control.

Application of insecticide shall be as per the manufacturer's recommended procedures and shall be in compliance with all applicable rules and regulations and at the direction of the Engineer.

The Applicator shall be responsible for collecting and disposing of all trapped and poisoned rats found in live-traps and tamper-proof boxes, and for the removal of all live-traps and tamper-proof boxes at the end of the work. The Applicator shall be responsible for posting and maintaining signs announcing the baiting and spraying of a particular location.

The Wildlife Control Agent licensed by NYSDEC, who will be responsible for the live-capture and removal of pond life shall use various techniques to accomplish his/her task. As the water in the pond is slowly drawn down, life will be concentrated in the center of the pond. A geofabric may need to be rolled over the muck to make the center of the pond accessible. The fish shall be caught with a seine (net), electric shock or other approved method, and shall be scooped into buckets. Traps shall be used for turtles. Buckets containing wildlife shall be kept shaded, and wildlife shall be relocated to off-site and upstream release sites immediately so that there is no need to use aerators.

D. Measurement and Payment

The quantity to be measured for payment under this section shall be the total number of hours necessary for completion of Vector, Pest and Wildlife Control.

The contract price per unit for Vector, Pest and Wildlife Control shall be indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.405-A. The unit price bid shall include the costs for all labor, materials, equipment and incidental expenses necessary or required to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.406

WOOD CHIPS

NO TEXT ON THIS PAGE

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7.407 JUTE MESHA. Description of Work

Under this item, the Contractor shall furnish and place jute mesh for steep slope protection within areas designated on the plans or where directed by the Engineer.

B. Material

JUTE MESH SPECIFICATION

<u>Property</u>	<u>Test Method</u>	<u>Typical Value</u>	<u>Units</u>
Yard Fiber	-	Woven jute, undyed & unbleached	
Yarn Count – Warp	-	78 per width min	
Weft	-	42 per linear yard, min	
Color	-	Natural (Brown, Earth Tone)	
Fabric Width	-	48"	Inches
Fabric Weight	-	14	oz/sq. yd.
Strands per Warp	ASTM D-3775	19.5	
per Weft	ASTM D-3775	14	
Mass per Unit Area	ASTM D-3776	14.7	oz/sq. yd.
	Warp		
Grab Tensile – Dry	ASTM D-4632	300	lbs/ft
	(modified) Fill	175	lbs/ft
Grab Tensile – Wet	ASTM D-4632	125	lbs/ft
	Warp		
	(modified) Fill	65	lbs/ft
Elongation at Break	ASTM D-4632	10	%
	Warp		
	(modified) Fill	10	%
Open Area	C.O.E. CW 002215	60-65	%
Durability	Field Experience	2-Jan	%
Water Velocity	University Channel Test	8	ft/sec

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Unit Shear Test	University Channel Test	2.76	lbs/sq. ft.
"C" Factor (1.5:1 Slope)	-	0.3	-
Mannings N	University Channel Test	0.0237	-

Wire Staples shall consist of 12-inch lengths of No. 11 gauge wire bent to form a "U" or other wire staples as approved.

Wood Pegs shall be wedge-shaped, approximately 1" x 2" x 6".

Smolder Resistance: The jute mesh shall be treated so as to be smolder resistant, meeting the following conditions:

The cloth shall be made resistant to smoldering and/or after-glow by treatment with non-leaching and non-toxic chemicals. The chemicals must be non-toxic to vegetation and the germination of seed. The chemicals used for this purpose must resist leaching based on the equivalent of two inches of rain. The cloth itself shall bear some identification mark to differentiate it from untreated jute cloth.

Test Method: When a lighted cigarette is placed on the upper or treated-surface of the cloth, neither flame nor after-glow will proceed in any direction more than 12" from the original position of the cigarette after it has burned out completely.

C. Method

Jute mesh shall be placed on topsoil perpendicular to slope contours where directed by the Engineer. Jute mesh shall be laid without stretching so that it lies loosely on the soil and in contact with the soil at all points and shall be pressed firmly into the soil surface by rolling or tamping. If seeding is required, it shall be done prior to the installation of the jute mesh.

The upper end of each roll of jute mesh shall be turned and buried to a depth of six (6) inches, with the soil firmly tamped against it. Jute mesh shall have a minimum lap of six (6) inches on all sides. Ends of rolls shall also have a minimum lap of six (6) inches with the upgrade section on top.

Check slots shall be constructed at intervals of 50 feet, unless otherwise directed by placing a fold of jute six (6) inches vertically into the ground with replaced soil tamped firmly against it.

Jute mesh shall be held tightly to the soil by staples or wood pegs driven firmly into the ground. Staples or wood pegs shall be spaced not more than

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three (3) feet apart, along the sides and center of the jute mesh and not more than one (1) foot apart at roll ends, check slots and at other critical areas as determined by the Engineer.

D. Maintenance

The Contractor shall maintain the areas of jute mesh installation until final acceptance of the contract. Maintenance shall consist of providing protection for jute mesh and repair of areas damaged by equipment, erosion, fire, or other causes, as well as re-establishment of the grade and conditions of the area as specified.

E. Measurement and Payment

The quantity to be measured for payment under this Section shall be the number of square feet of surface area on which jute mesh has been installed in accordance with the plans and specifications and directions of the Engineer.

The Contract price per square feet of Jute Mesh shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.407. The bid price shall include the costs for all labor, material, equipment and incidental in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.408B HERBICIDE APPLICATIONA. Description of Work

Under this item, the Contractor shall apply herbicide to persistent weeds and weedy growth in accordance with the plans and specifications and as directed by the Engineer.

B. Quality Assurance

The Herbicide Applicator must possess a valid NYSDEC Type 5A - Aquatic Vegetation Pesticide Applicator Certification License.

C. Materials and Construction Methods

The work will eradicate invasive, non-native plants in upland and wetland areas using Glyphosate for eradication of all plants except Oriental Bittersweet, which will be treated with Garlon 4. All chemicals to be applied using backpack and hand held sprayers and individual stem wipe applications. Herbicides application to open water/marshlands is prohibited.

In Wetlands, the Contractor shall spray Rodeo Herbicide or approved equal onto specified weedy growth only, as directed by the Engineer, between May and September.

The Applicator shall spray to wet--not to the point of runoff. Care must be taken to properly calibrate the tank nozzle so as 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.

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 at the request of the engineer to prevent the accidental treatment of desirable plant material.

Apply 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.

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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.

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.

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.

The Contractor shall return to the site after ten (10) days and remove any dead vegetation that may interfere with planting of new material. If a second application is deemed necessary, a minimum of 10 days is required before installing any new plant material. Planting may proceed when the site is deemed acceptable to the Engineer.

The plant species to be eradicated primarily include, but shall not be limited to the following, and shall include additional species at the direction of the engineer:

Japanese Knotweed (*Polygonum cuspidatum*)
Mutiflora Rose (*Rosa mutiflora*)
Purple Loosestrife (*Lythrum salicaria*)
Oriental Bittersweet (*Celastrus orbiculatus*)
Black Locust (*Robinia pseudoacacia*)
Japanese Honeysuckle (*Lonicera japonica*)
Common Reed (*Phragmites australis*)
Mile-A-Minute Vine (*Polygonum perfoliatum*)
Mugwort (*Artemisia vulgaris*)
Common Ragweed (*Ambrosia artemisifolia*)
Giant Ragweed (*Ambrosia trifida*)
English Ivy (*Hedera helix*)
Japanese Stiltgrass (*Microstegium vimineum*)
Porcelain Berry (*Ampelopsis brevipedunculata*)
Burning Bush (*Euonymus alatus*)
Russian Olive (*Elaeagnus angustifolia*)
Giant Hogweed (*Heracleum mantegazzianum*)
Tree of Heaven (*Ailanthus altissima*)
White Mulberry (*Morus alba*)

D. Measurement and Payment

The quantity to be measured for payment under this section shall be the total number of crewdays (shifts) necessary for completion of Herbicide

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Application. A crewday (shift) is defined as one period from 8AM – 4PM, including lunch and breaks. The crew shall consist of two workers.

The contract price per unit for Herbicide Application shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.408-B. The unit price bid shall include the costs for all labor, materials, equipment and incidental expenses necessary or required to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.409

MYCORRHIZAL INOCULANTS

NO TEXT ON THIS PAGE

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7.410 PLANT PROTECTION FENCEA. Description of Work

The Contractor shall furnish all materials, labor, and equipment necessary to install the plant protection fence specified herein and as shown on the Contract Drawings, including all incidental and appurtenant work required for a complete job.

The plant protection fence shall protect recently installed plant material from pedestrian and vehicular traffic. The plant protection fence shall be maintained in good condition and repaired as necessary by the Contractor during the landscaping and plant guarantee period as directed by the Engineer and restoration specialist.

B. Materials and Methods

The plant protection fence shall be all welded wire, constructed of wire fabric fastened to middle rails and to vertical line metal posts. These posts are 6 ft. on center and are driven into the subgrade a minimum of 2 ft. The fence is 4 ft. high and shall conform to the detail for Construction limit fence on the Contract drawings.

The plant protection fence shall be located where indicated on the Contract Drawings. The fence shall be adjusted to avoid interference with trees and to maintain access to houses.

C. Maintenance

The plant protection shall be inspected periodically (at least once per week), or as directed by the Engineer through the plant guarantee period. Any required repairs shall be made immediately. At the end of the plant guarantee period the fence shall be removed by the Contractor.

D. Measurement and Payment

The quantity to be measured for payment under this Section shall be the total number of linear feet of plant protection fence furnished, installed and maintained in accordance with the Plans and Specifications and the directions of the Engineer.

The contract price per linear foot for Plant Protection Fence shall be as indicated on the BID SCHEDULE OF PRICES, Item No. BMP-7.410. The unit price per linear foot shall include all labor, materials, equipment and work incidental expenses necessary or required to complete the work

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in accordance with the plans and specifications and to the satisfaction of
the Engineer.

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7.411

WATERING AND WEEDING DURING GUARANTEE PERIOD

NO TEXT ON THIS PAGE

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7.412

SLOPE STABILIZATION

NO TEXT ON THIS PAGE

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7.413

TEMPORARY GOOSE EXCLUSION FENCE

NO TEXT ON THIS PAGE

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7.414 BMP AS-BUILT PLANSA. Description of Work

Under this item the Contractor is to provide all labor, materials, tools and equipment necessary to complete the work described below in complete accordance with the Contract Documents and the direction of the Engineer.

B. BMP As-Built Plans and Information

The Contractor shall be responsible for providing a survey of final topographical features with contour lines every one (1) foot of elevation at a scale of 1" = 20'. The survey shall include all adjoining property lines. The survey shall indicate and clearly label all new reconstructed/rehabilitated structural features which include but are not limited to the following:

- Tipping elevation of water at weir structure;
- Inlet and outlet elevation of low flow pipe;
- Inlet and outlet elevations of drain pipe;
- Permanent pool elevation;
- Bottom elevations of forebay, low flow channel and micropool;
- All pipes, headwalls, manholes, weirs, and any other structure that is part of the storm drainage system;
- Boundary fencing and survey monuments;
- Planting spreadsheet indicating zone elevation, species, and quantity planted;
- Location, size and species of all existing trees greater than six (6") caliper.

The Contractor shall submit the as-built plans with the above information included as an electronic file to the Restoration Specialist. The Contractor shall supply the surveys immediately after the completion of each BMP site to allow the Restoration Specialist time to complete the landscape survey. The Restoration Specialist shall verify the contractor's information and include his/her information along with any additional planting and natural features information on a separate sheet to the as-built plans. Paper prints of the completed as-built plans shall be provided by the Contractor to the Engineer for review.

The approved final as-built plans shall be stamped by the professional surveyor and sent as a mylar set to the NYC Department of Design and Construction for inclusion in the final complete set of project as-built plans. The final as-built BMP plans shall consist of the following three sheets per site; 1) a base map stamped by the surveyor with property lines, contours, structures, and invert elevations, 2) a tree and shrub plan, and 3) a

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herbaceous planting plan. The NYCDDC shall be responsible for routing three (3) complete sets of as-built plans to the following locations:

NYCDEP Mapping and Records Division
59-17 Junction Boulevard
Flushing, NY 11373-5108

NYCDEP Water and Sewer Permitting
10 Richmond Terrace
Staten Island, NY 10301

NYCDEP Staten Island Bluebelt
182 Joline Avenue
Staten Island, NY 10307

The Contractor shall also submit as an electronic file, AutoCAD 2008 and six sets of paper prints of the approved final (BMP only) as-built plans to the NYCDEP Bluebelt field office located at 182 Joline Avenue, Staten Island, NY 10307, and 3 sets of paper prints to the NYCDEP Staten Island Bluebelt main office located at 59-17 Junction Boulevard, 12th Floor, High Rise, Flushing, NY 11373-5108.

C. No Separate Payment

No separate payment shall be made for this work of the specification. All costs shall be included in the various Contract Items of this Contract.

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7.415 VINE AND INVASIVE PLANT REMOVALA. Description of Work

Under this item, the Contractor shall remove all vines and invasive plants at Staten Island Bluebelt properties throughout the BMP project area and watershed and as directed by the Engineer

B. General Removal Methods

All vine and invasive plant material shall be removed by hand. The removal of these plant and materials shall be from existing trees, fence lines, utility poles and lines, adjacent structures, BMP sites, and other areas within the watershed. All vines and invasive plant material removed shall be disposed of by the Contractor at the Contractor's own expense.

The Contractor shall carefully protect all trees, shrubs and other plant material and structures during the vine and invasive plant removal operation. Any repair to damaged trees, fence, shrubs, and other plants and structures resulting from the vine and invasive plant removal operation will be repaired by the Contract at the Contractor's own expense.

The removal of vines and invasive plants under this item is to be done in conjunction with the work covered under Specification Section 7.408B, Herbicide Application.

The vines and invasive plants to be removed will be identified by the Engineer and restoration specialist and clearly marked prior to removal. No trees are to be removed under this item.

The plant species to be eradicated primarily include, but shall not be limited to the following, and shall include additional species at the direction of the engineer:

Japanese Knotweed (*Polygonum cuspidatum*)
Mutiflora Rose (*Rosa mutiflora*)
Purple Loosestrife (*Lythrum salicaria*)
Oriental Bittersweet (*Celastrus orbiculatus*)
Black Locust (*Robinia psuedoacacia*)
Japanese Honeysuckle (*Lonicera japonica*)
Common Reed (*Phragmites australis*)
Mile-A-Minute Vine (*Polygonum perfoliatum*)
Mugwort (*Artemisia vulgaris*)
Common Ragweed (*Ambrosia artemisifolia*)
Giant Ragweed (*Ambrosia trifida*)
English Ivy (*Hedera helix*)

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Japanese Stiltgrass (*Microstegium vimineum*)
Porcelain Berry (*Ampelopsis brevipedunculata*)
Burning Bush (*Euonymus alatus*)
Russian Olive (*Elaeagnus angustifolia*)
Giant Hogweed (*Heracleum mantegazzianum*)
Tree of Heaven (*Ailanthus altissima*)
White Mulberry (*Morus alba*)
Norway Maple (*Acer platanoides*)

C. Measurement and Payment

The quantity to be measured for payment under this section shall be the total number of crewday (shifts) necessary for completion of Vines and Invasive Plant Removal. A crewday (shift) is defined as one period from 8AM – 4PM, including lunch and breaks. The crew shall consist of three gardeners and one supervisor. The crew shall also consist of the following equipment:

One (1) truck (10-15 cubic yard enclosed hydraulic dump body)
Manual Pole Saw (2)
Full Size Lopping shears
Tool Kit including files for minor mechanical repairs
Dirt Shovel
Sweep Type Broom Rake
Hand Saw
First Aid Kit
Ear and Eye Protectors
Hand Saw with Scabbard (2)
Axe
Broom
Hard Hats
Safety cones
Red Flags
Danger Signs

The contract price per unit for Invasive Vine and Plant Removal shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.415. The unit price bid shall include the costs for all labor, materials, equipment, vehicles and incidental expenses necessary or required to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.416

GALVINIZED CHICKEN WIRE

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7.417 DEBRIS EXCLUSION FENCE

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7.418 SANDA. Description of Work

Under this item, the Contractor shall provide clean sand to provide as base for the gravel road surface when on top of the slope stabilization mat in accordance with the plans and directed by the Engineer.

B. Material

Material shall consist of sand, free of organic material, loam, debris, frozen soil or other deleterious material which may be compressible. The sand shall 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 should 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 ($C_u = D_{60}/D_{10}$) less than 6, are unacceptable.

Tests shall be required and shall serve as a representative analysis for every 200 cubic yards of material utilized.

Clean sand shall 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.

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.

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C. Spreading

Clean sand shall be mixed with the topsoil/compost mix at the following ratio: 75% clean sand to 25% topsoil/compost mix prior to spreading on the topsoil area as described in 7.403.

D. Measurement and Payment

The quantity of sand to be paid for under this item shall be the number of cubic yards of clean sand furnished from off-contract site sources (i.e. suppliers approved by the engineer), mixed, placed and incorporated in the completed work in accordance with the plans and specifications to the satisfaction of the Engineer, measured in trucks used for delivery, at the site of the work. The quantity of clean sand to be paid for under this item shall be measured in cubic yards in trucks used for delivery. No clean sand shall be furnished until ordered by the Engineer. Delivery ticket with name and address of vendor, date and estimated volume must be supplied to the Engineer prior to truck measurement.

The contract price per unit for Sand shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.418. The bid price shall be a unit price per cubic yard of Sand, and shall include the cost of all labor, materials and equipment necessary to prepare furnish and place the sand, and all other work incidental thereto, in accordance with the plans and specifications to the satisfaction of the Engineer. Payment for all other materials in gravel accessway with slope stabilization mat shall be paid under other items.

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7.419 TREE AND ROOT PRUNINGA. Description of Work

Under this Section, the Contractor shall provide all labor, materials, equipment, insurance, licenses, permits and payments of fees, tolls and taxes, together with all work required for general branch and root pruning, including the removal of all debris generated during the completion of this work.

All work shall be performed as directed by the Engineer. The work to be performed by the Contractor shall be done only when and where the Contractor is ordered to perform such work by DDC. Tree pruning in natural areas may have restricted or no vehicle access and in such cases trees will have to be climbed and roped by experienced personnel.

Skilled persons directly employed and supervised by the Contractor shall perform all work. All work shall be performed in a professional manner and in accordance with the most current revisions of the American National Standards for Tree Care Operations: Tree, Shrub, and other Woody Plant Maintenance and Standard Practices A-300-2001 and the American National Standards for Arboricultural Operations: Pruning, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements Z-133.1-2000, published by the American National Standards Institute (ANSI).

Contractors shall have in their possession, or available to them, the following materials: trucks, aerial lifts, chippers, hand tools, climbing equipment, and other equipment and supplies required to perform this work. The Contractor shall also have current certification to perform the work, as specified below.

The description of the work is for general information only. It is not to be construed as an exclusive definition of the quantity or type of work that will be required.

B. Health and Safety

All work shall follow all arboricultural standards, as specified herein, and all City, State and Federal regulations as applicable. The Contractor is responsible for the preparation and submission of a Health and Safety Plan to DDC. The HASP must be approved by DDC before any of the work begins. In accordance with the HASP, the Contractor shall perform the work with all due care, taking precautions against injury to persons and damage

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to property, and against interference with traffic or abutting property. The Contractor shall at his/her expense erect barricades, display lights or signs, give warnings and adopt and enforce rules and regulations as may be necessary or required by DDC or by authorities having jurisdiction to safeguard the public.

The Contractor shall furnish a twenty-four (24) hour telephone number of three (3) responsible members or employees of the Contractor's firm who can be reached in times of emergency resulting out of or in connection with the work to be performed.

C. Personnel and Equipment

All work shall be performed by skilled persons directly employed and supervised by the Contractor.

1. Contractor's Certification and Experience

- a. At least one employee on each crew working within ten (10) feet of energized conductors must be a qualified line clearance tree trimmer.
- b. The pruning shall be performed under the supervision of an "ARBORIST" from the International Society of Arboriculture (I.S.A.) or an equivalent certification or experience.
- c. The Contractor shall be certified by the New York State Department of Agriculture and Markets to perform work within Asian Longhorned Beetle Quarantine Zones.

2. Contractor's Equipment List

- a. The Contractor shall furnish a list of proposed vehicles and equipment to be used in the completion of this work at the time of the pre-construction meeting.
- b. All equipment shall be in good working condition. The Contractor shall remove and replace any equipment in unsatisfactory condition or unsuitable for the required work as deemed by DDC.
- c. To ensure that out of service equipment be returned to service in two (2) days or less, the Contractor shall provide at all times a 24 hour repair or replacement center with maximum response time of two (2) hours.

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- d. Unacceptable equipment or lack of equipment shall be grounds for disqualification of the Contractor.
- e. All required documentation and information must be provided at the time of the pre-construction meeting unless otherwise agreed to by DDC.

D. Tree Pruning Method

The Contractor shall prune trees in accordance with accepted arboricultural practices, to the satisfaction of and in the order directed by the Engineer.

At each marked tree location, the Contractor shall perform some or all of the following pruning work as directed by the Engineer.

1. Crown Cleaning to remove dead, broken, crossing, rubbing, damaged (storm or otherwise), fungus and insect infected branches, dead or decaying stubs, suckers and all other undesirable growth. Live growth should not be removed unnecessarily. Clean pruning will be performed on all branches 1 inch in diameter and larger. Injured areas where healing is not taking place properly may be bark traced in accordance with accepted arboricultural practices.
2. Crown Thinning to improve the penetration of street lighting. Proper thinning retains crown shape and should provide an even distribution of foliage throughout the crown. The percentage of live foliage removed must not exceed 15%. Only remove branches ¼ to 1 inch in diameter. Excessive limb removal on the lower two-thirds of any branch or stem (lion tailing) is not acceptable.
3. Crown Raising to provide a vertical and horizontal clearance from vehicles, pedestrians, signs, buildings, lights, and transmission lines. In lifting bottom branches of trees for under clearance, care should be given to preserve the symmetrical appearance of the tree. This work may involve both the removal and shortening of limbs. Branches greater than half of the trunk diameter should not be removed. Unless otherwise directed, the canopy should be raised to 15 feet over roads, 8 feet over sidewalks and pruned to give 6 feet clearance from buildings.
4. Root pruning shall be done when roots are damaged during construction or excavation.

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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). Reduction cuts (lateral cuts or drop crotch cuts) should be to a lateral branch at least one-third to one-half the diameter of the removed portion. Do not leave stubs. 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 be removed.

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 Engineer.

All trees which require maintenance due to root and trunk damage shall be guaranteed for one year against death. If during this time, said trees die due to root and trunk damage, they shall be removed and replaced according to Department of Parks and Recreation removal and tree planting specifications.

The Contractor shall lower any branch that would injure the tree or other property when falling using ropes.

In the case of trees with Dutch Elm Disease, or as directed by the Engineer, the Contractor shall disinfect all tools between use on other trees with alcohol or bleach, due to the danger of transmitting the disease on tools. All tools shall be disinfected between each use on each tree.

In the case of locations with restricted access, parked cars or where designated trees taller than the working height of a bucket, trees shall be pruned using ropes and saddles. The use of hydraulic limb loppers, hydraulic saws or climbing spikes is not acceptable. Use of any such prohibited equipment will be grounds for default proceedings.

Working Hours

All work shall be performed during the five- (5) day, forty- (40) hour week, from Monday to Friday, inclusive between the hours of 8:00 A.M. and 4:00 P.M., except for legal holidays or unless otherwise directed by DDC. The Contractor is expected to work in rain and adverse weather, unless otherwise approved by DDC. No work shall commence on streets adjacent to schools prior to 9:00 A.M. or after 2:00 P.M., when school is in session.

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The Contractor's employees shall wear identification, approved by the Project Manager, at all times while performing this work.

Work Area

All work areas shall be kept in such a manner to cause as little inconvenience as possible to the general public and adjacent property owners. When it is necessary to close pedestrian walks, vehicular traffic lanes or private driveways, the Contractor shall provide personnel barricades, warning signs, cones, flags or other means required by governing rules and ordinances.

Should work require the Contractor to place equipment and/or personnel on private property, the Contractor shall obtain the property owners' permission in writing and shall notify DDC prior to the performance of any work. The Contractor shall develop a permission/indemnification form to be used for this purpose. Sites may be designated as temporary debris staging areas at the sole discretion of DDC.

External Situations

The Contractor shall appropriately address external influences, including encounters with rats, hornets, wasps, yellow jackets or other animals and insects that could interfere with tree pruning work. The Contractor shall remove all signs, boards, hoops, bags, guide wires, tree grates, tree guards, fences, poles or other foreign objects. The Contractor is responsible for addressing and solving these problems at no additional cost to the City.

E. Debris Disposal

The Contractor shall remove all debris generated during the course of a day from the contract site no later than the completion of that day's work.

The Contractor must obtain written approval from the Engineer to store or spread clean chips on City property within the borough at designated locations.

F. Plant Pest Control Requirements

Contractors shall comply with Federal and State Department of Agriculture regulations for plant pest control. In general, State Department of Agriculture regulations require contractors operating in infested areas to thoroughly clean all equipment units before moving to non-infested areas.

The Contractor and/or subcontractors shall be certified by the New York State Department of Agriculture & Markets to perform work within the Asian Longhorned Beetle Quarantine Zone. The Contractor must review

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and abide by the description of the quarantine and compliance agreements as presented in the publication entitled Part 139 of the New York State, Department of Agriculture & Markets law. Full information can be obtained from Federal and State Pest Control personnel. Quarantine areas, for the purpose of this contract shall be defined as all five Boroughs of New York City.

The Contractor shall also be responsible for complying with all state and federal requirements for infestations by the Emerald Ash Borer, including but not limited to those by the New York State Department of Agriculture and Markets.

G. Contractor's Representative

At the discretion of the Engineer, the Restoration Specialist must be present at the work site during all times work is being performed. While this work is being performed, a Supervisor or employee of the Contractor with equivalent authority who is not a member of the work crew(s) shall be present to properly direct and deploy the work crew(s) in completing the listed work. The foregoing provision shall be complied with irrespective of whether work is being performed by the Contractor or his sub-contractor's forces. The Contractor's representative shall maintain daily communication with the Restoration Specialist.

H. Inspection

DDC shall conduct an inspection of all work to ensure compliance with specifications. The Engineer has final discretion for approving all work for payment. No partial payments will be made for incomplete or unsatisfactory work. After the inspection is completed and the Contractor is notified in writing by DDC, the Contractor has two (2) weeks from the date of notification to complete any incomplete or unsatisfactory work.

DDC reserves the right to hold/reject the invoice if there is any incomplete or unsatisfactory work outstanding. The City will not pay any interest on the invoices that are held due to incomplete or unsatisfactory performance of the Contractor.

I. Completion

The Restoration Specialist will supply the Contractor with a list of trees where pruning is to be performed. The Restoration Specialist shall have the right to add or delete any locations from the list. In general, the Contractor shall mobilize his/her crews within five (5) working days from the issuance of the list.

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J. Measurement and Payment

The quantity to be measured for payment under this section shall be the total number of crewday (shifts) necessary for completion of general tree pruning, for eight (8) consecutive hours of work performed on weekdays between the hours of 8 a.m. and 4 p.m. All mobilization and incidental costs, including the disposal of wood chips, are included in the prices submitted by the Contractor. The contract price per shift for Tree and Root Pruning shall be as indicated on the BID SCHEDULE OF PRICES, Item No. BMP-7.419.

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7.500

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES

Under soil erosion and sedimentation control work, the Contractor shall provide all labor, materials, tools and equipment necessary to complete the execution of the work in complete accordance with the Specifications and all Contract Drawings. All Soil Erosion and Sedimentation Control work shall be done in conformance with and subject to the renewed State Pollutant Discharge Elimination System (SPDES) General Permits for Discharges Stormwater from Construction Activity, GP-0-08-001, the latest edition of the "New York Guidelines for Urban Erosion and Sediment Control" published by the Empire State Chapter of the Soil and Water Conservation Society, and the New York State Department of Transportation Standard Specification Part 107-12 -Soil, Erosion and Air Pollution Statement, including, but not limited to, the following methods of erosion and sedimentation control.

1. Slopes left exposed will, within 30 working days of completion of any phase of grading, be planted or otherwise provided with ground cover device, or structures sufficient to restrain erosion.
2. A ground cover sufficient to restrain erosion must be planted or otherwise provided within 15 working days on that portion of the tract (disturbed area) upon which further active construction is not being undertaken.

The Contractor shall submit for approval by the Engineer and NYSDEC, a written Erosion and Sedimentation Control Plan, prepared by a Certified Professional in Erosion and Sediment Control (CPESC), who is a Professional Engineer (P.E.) or under the supervision of a P.E. The Erosion and Sediment Control Plan must be signed and sealed by that CPESC and/or the supervising P.E. The Plan shall comply with all conditions of the applicable freshwater wetland permit issued by NYSDEC.

The Erosion and Sedimentation Control Plan shall conform to the guidelines as set forth in the latest edition of the "New York Guidelines for Urban Erosion and Sediment Control" published by the Empire State Chapter of the Soil and Water Conservation Society and he/she shall implement the followings:

- No stockpiling of excavated material would be allowed in a manner or location that would permit erosion and its subsequent sedimentation in wetlands or other natural areas.
- No storage of soil shall be permitted within the Contract limits. Soil is deemed to be for this requirement any sediment including material such as topsoil fill, sand, any excavated material, boulders, stones, cold patch, etc.

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- Storm sewers will be installed in a sequence and manner that reduces the time during which the tops of excavated areas would be exposed and vulnerable to erosion.
- At the end of each day's work, the street where sewers are being installed will be cleaned and swept to reduce the amount of soil that could potentially impact downstream areas as sediment. The Contractor shall be required to have a street sweeper on the site.
- Use truck tracking pads at the construction access locations to remove sediment from the tires of the trucks and other construction equipment prior to driving on the adjacent streets.
- Utilize sediment basins, sediment traps and/or sediment filters in the erosion control plan to capture sediment from run-off and from water produced by dewatering operations.
- Use portable sediment tanks to remove sediment from water generated by dewatering operations. All water from dewatering shall be treated before discharge into any surface water bodies, unless the turbidity of the effluent is less than three times the ambient level of the receiving water body as measured by the turbidity meter in standard units (i.e. NTU's).
- The Contractor shall supply all portable equipment.
- Use construction limiting fence, staked hay bales, and/or reinforced silt fence as shown on Contract Drawings, unless otherwise directed by the Engineer.
- Schedule work in wet areas, such as BMP sites, during relatively dry summer months.
- Employ water diversions to direct the stream away from the area being worked on, so as to create drier conditions for in-stream work.
- Use temporary pumping sump to control water level at site.
- Prior to the start of construction activities, such as sewer installation, inspect all erosion control measures and continually monitor them, especially after each storm event.
- If Permittee uses dewatering methods which produce effluent discharges, Permittee shall monitor each discharge effluent and receiving water body. Discharges shall not cause substantial visible contrast to the natural condition in any receiving water body. A

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meter which records turbidity in standard units (i.e. NTUs) shall be utilized to establish ambient conditions in each water prior to discharge. If any monitored turbidity level exceeds three times the ambient level of the receiving water body, the Permittee shall insure (e.g., by reducing the flow rate or otherwise adjusting the dewatering system) that no substantial visible contrast to the natural condition in the receiving water body occurs. The action(s) taken, or the decision not to take any action, shall be recorded in the monitors log.

The Contractor shall not receive any payment for the preparation of the Erosion and Sedimentation Control Plan. Installation of the Erosion and Sedimentation features and maintenance of them will result in payment for their respective items as described in Section 7.501 through 7.510. The work shall take place at BMP sites only and is not payment for street work or the installation of sewers.

The work shall include items of work specified under the following sections:

<u>Section Number</u>	<u>Title</u>
7.502	Construction Limit Fence
7.504	Reinforced Silt Fence
7.505	Sand Bags
7.506	Sediment Trap with Filter
7.509A	Stabilized Construction Entrance
7.512	Dirtbag
7.517	Slope Stabilization Mat

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7.501

MAINTENANCE OF EROSION CONTROL MEASURES

NO TEXT ON THIS PAGE

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7.502 CONSTRUCTION LIMIT FENCEA. Description of Work

The Contractor shall furnish all materials, labor, and equipment necessary to install the construction limit fence specified herein and as shown on the Contract Drawings, including all incidental and appurtenant work required for a complete job. The construction limit fence is used to mark the limit of the construction activity and to protect the adjacent areas.

Upon furnishing and installing the above sedimentation and erosion control device but prior to commencing any other work on-site, the Contractor shall notify the Engineer and arrange for an on-site inspection.

The construction limit fence shall be maintained in good condition and repaired as necessary by the Contractor during the construction and post-construction/site stabilization phases as directed by the Engineer.

B. Materials and Methods

Construction Limit Fence: The construction limit fence shall be a welded wire fence with a minimum height of four (4) feet. The fence shall be constructed of wire fabric fastened to vertical line posts.

Wire fabric shall be of No. 6 gauge wire with a mesh of approximately 2 inches. The upper edge of the fabric shall be twisted and barbed. The fabric shall be securely fastened to vertical line posts by means of ties and spaced not more than 12 inches apart on rails and not more than 14 inches apart on line posts.

The construction limit fence shall be located where indicated on the Contract Drawings. The fence shall be adjusted to avoid interference with trees and to maintain access to houses.

Line posts shall be spaced not more than 6 feet on centers. Posts shall be securely set in the ground. Line posts shall extend at least 2 feet below finished grade. Post locations shall be adjusted to avoid tree roots as appropriate.

C. Maintenance

The construction limit fences shall be inspected periodically (at least once per week), or as directed by the Engineer. Any required repairs shall be made immediately.

D. Measurement and Payment

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The quantity to be measured for payment under this Section shall be the total number of linear feet of construction limit fence furnished, installed and maintained in accordance with the Plans and Specifications and the directions of the Engineer.

The contract price per linear foot for Construction Limit Fence shall be as indicated on the BID SCHEDULE OF PRICES, Item No. BMP-7.502. The unit price per linear foot shall include all labor, materials, equipment and work incidental expenses necessary or required to complete the work in accordance with the plans and specifications and to the satisfaction of the Engineer.

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7.503

STAKED STRAW BALES

NO TEXT ON THIS PAGE

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7.504 REINFORCED SILT FENCEA. Description of Work

The Contractor shall furnish all materials, labor, and equipment necessary to construct reinforced silt fence specified herein and as shown on the Contract Drawings, including all incidental and appurtenant work required for a complete job.

Upon furnishing and installing the approved reinforced silt fence but prior to commencing any other work on-site, the Contractor shall notify the Engineer and arrange for an on-site inspection.

The reinforced silt fence shall be maintained in good condition and repaired as necessary by the Contractor during the construction and post-construction/site stabilization phases as directed by the Engineer.

B. Materials and Methods

1. Construction (Limiting) Fence: The construction (limiting) fence shall be a welded wire fence with a minimum height of four (4) feet. The fence shall be constructed of wire fabric fastened to the middle rails and to vertical line posts.

Wire fabric shall be of No. 6 gauge wire with a mesh of approximately 2 inches. The upper edge of the fabric shall be twisted and barbed. The fabric shall be securely fastened to vertical line posts by means of ties and spaced not more than 12 inches apart on rails and not more than 14 inches apart on line posts.

The construction (limiting) fence shall be located where indicated on the Contract Drawings. The fence shall be adjusted to avoid interference with trees and to maintain access to houses.

Line posts shall be spaced not more than 6 feet on centers. Posts shall be securely set in the ground. Line posts shall extend at least 2 feet below finished grade. Post locations shall be adjusted to avoid tree roots as appropriate.

2. Filter Fabric: Filter fabric shall be securely attached to the vertical line posts and wire fabric, and shall be situated between the wire fabric and staked straw bales.

The filter fabric shall be purchased and delivered in a continuous roll and cut on-site to the length of the barrier(s) to avoid the use of joints. Dimensions of the roll shall be thirty-six (36) inches by one hundred (100) feet in length. When joints are necessary, filter cloth

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shall be spliced together only at a line post, with a minimum 6-inch overlap, and securely sealed. The filter fabric shall meet NYSDOT specifications on same, and shall be fabric MUTUAL MISF 1776 as manufactured by Mutual Industries Inc.; Fabric # GTF190 as manufactured by Linq Industrial Fabric; Fabric # 2130 as manufactured by Propex, or approved equal.

A trench shall be excavated approximately 4 inches wide and 4 inches deep along the line of posts and upslope from the barrier. The filter fabric shall be extending into the trench, the trench backfilled, and the soil compacted over the filter fabric.

Siltation fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

3. Straw Bales: All straw bales shall be of straw, and shall be standard sized bales. Bales shall be placed in a single row, with ends of adjacent bales tightly abutting one another. Bales shall be placed upslope of the filter fabric, and shall at all times run parallel to the construction (limiting) fence and abut the filter fabric.

All bales shall be fiber-bound. No string bound straw bales are accepted. Straw bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales in order to prevent deterioration of the bindings.

The straw bale barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a depth of 4 inches. After the bales are staked and chinked, the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground to the ground level on the downhill side and shall be built up to 4 inches against the uphill side of the straw bale barrier.

Each bale shall be securely anchored by at least two stakes or steel reinforcing bars driven through the bale. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or reinforcing bars shall be driven deep enough into the ground to securely anchor the bales.

The gaps between bales shall be chinked (filled by wedging) with straw to prevent water from escaping between the bales. The Contract shall scatter loose straw over the area immediately uphill from the straw bale barrier to increase barrier efficiency.

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Straw bale barriers shall be removed when they have served their usefulness, but not before the upslope areas have been permanently stabilized.

C. Maintenance

The reinforced silt fences shall be inspected periodically (at least once per week), or as directed by the Engineer. Any required repairs shall be made immediately.

Filter fabric shall be inspected at least once per week and immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately. Should the fabric decompose or become ineffective prior to the end of the expected usable life while the barrier is still necessary, the fabric shall be replaced promptly.

Straw bales shall be inspected at least once per week and immediately after each rainfall and at least daily during prolonged rainfall. Close attention shall be paid to the repair of damaged bales, end runs and undercutting beneath bales. Necessary repairs to barriers or replacement of bales shall be accomplished promptly. Sediment deposits should be removed after each rainfall. They must be removed when the level of deposition reaches approximately one-half foot deep in front of the straw bale. Any sediment deposits remaining in place after the straw bale barrier is no longer required shall be dressed to conform to the existing grade.

D. Measurement and Payment

The quantity to be measured for payment under this section shall be the total number of linear feet of Reinforced Silt Fence, installed and maintained in accordance with the plans, specifications and directions of the Engineer. The construction (limiting) fence, filter fabric and staked straw bales which together make up the reinforced silt fence shall be measured as one erosion and sediment control feature.

The contract price per linear foot for Reinforced Silt Fence shall be as indicated on the BID SCHEDULE OF PRICES, Item No. BMP-7.504. The bid price shall constitute full compensation for all labor, materials and equipment and incidental expenses necessary to complete the work in accordance with the plans and specifications and to the satisfaction of the Engineer.

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7.505 SAND BAGSA. Description of Work

The Contractor shall furnish all materials, labor, and equipment necessary to construct the sand bag wall specified herein and as shown on the Contract Drawings, including all incidental and appurtenant work required for a complete job.

The installation of the sand bag wall shall be maintained in good condition and repaired as necessary by the Contractor during the construction and post-construction/site stabilization phases as directed by Engineer.

B. Materials and Methods

1. The bags shall be of coarse heavy woven synthetic non-biodegradable and non-photo degradable.
2. Sand shall meet ASTM C33 concrete and specifications.
3. Sand bags shall be installed at the locations shown on the Contract Drawings and as directed by the Engineer.
4. Each bag shall be filled with 40 lbs of dry clean sand.

C. Measurement and Payment

The quantity to be measured for payment under this Section shall be the total number of sand bags furnished and installed in accordance with the Contract Drawings, specifications and directed by the Engineer.

The contract price per sand bag shall be as indicated on the BID SCHEDULE OF PRICES, Item No. BMP-7.505. The bid price shall constitute full compensation for all labor, materials, equipment and incidental expenses necessary to complete and maintain the work in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.506 SEDIMENT TRAP WITH FILTER

A. Description of Work

The Contractor shall furnish all materials, labor, and equipment necessary to construct the Sediment Trap specified herein and as shown on the Contract Drawings, including all incidental and appurtenant work required for a complete job. A Sediment Trap is typically intended to serve a drainage area of three acres or less. Therefore, it is not as large as a sediment basin.

Upon furnishing and installing the approved sediment trap but prior to commencing dewatering operations, the Contractor shall notify the Engineer and arrange for an on-site inspection.

The sediment trap shall be maintained in good condition and repaired as necessary by the Contractor during the construction and post-construction/site stabilization phases as directed by the Engineer.

B. Materials

1. Rip-Rap: The rip-rap shall have a d50 of 6".
2. Staked Hay Bales. All Hay Bales shall be of straw and shall be standard sized bales as shown in the Contract Drawings. All bales shall be fiber-bound. No string-bound hay bales are acceptable.
3. Perforated Corrugated Pipe. A six inch diameter pipe shall be used as shown on the Contract Drawing.
4. Sand bags. The bags shall be of coarse heavy woven fabric (burlap). The sand shall meet ASTM C33 concrete specifications.
5. Filter Cloth. The filter cloth used for wrapping the corrugated pipe, shall be Encadrain 9120 or equivalent with the following specifications:

<u>Property</u>	<u>Test Method</u>	<u>Unit</u>	
Material	Non-woven	geotextile fabric	
Unit Weight	ASTM D1777	oz./sq. yd	4.3 (min)
Flow Rate	Falling Head Test	gpm/sq.ft	120 (min)
Puncture	ASTM D751	lbs.	60 (min)
Thickness		in.	0.8 (min)

6. Reinforced Silt Fence as described in Specification Section 7.504.

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C. Construction Method

1. The area under excavation shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. Place the filter cloth in the bottom of the pool.
3. Place the rip- rap over the cloth as shown on the Contract Drawings.
4. Place the hay bales and sand bags in a single row, with ends of adjacent bales and bags tightly abutting one another. Refer to the Contract Drawings.
5. Wrap the perforated, corrugated pipe with the filter cloth and place it where is shown on the Contract Drawings.
6. The structure shall be inspected after each rain and repaired as needed.

D. Measurement and Payment

The quantity to be paid for under this item shall be the number of sediment traps with filters placed in accordance with the plans and specifications to the satisfaction of the Engineer, measured in number of above items at the site of the work. The sand bags, reinforced silt fence hay bales, filter cloth, pipe and rip-rap and sediment filter which together make up the Sediment Trap shall be measured as one erosion and sediment control feature.

The contract price per unit for sediment traps with filters shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.506A. The bid price shall be a unit price per sediment trap and shall include the cost of all labor, materials and equipment necessary to furnish, place and incorporate and all other work incidental thereto, in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.507

SEDIMENT FILTER

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7.508

SEDIMENT BASIN

NO TEXT ON THIS PAGE

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7.509A STABILIZED CONSTRUCTION ENTRANCEA. Description of Work

The Contractor shall furnish all materials, labor, and equipment necessary to construct the stabilized construction entrance specified herein and within the limits as shown on the Contract Drawings, including all incidental and appurtenant work required for a complete job.

Upon furnishing and installing the stabilized construction entrance but prior to commencing any other work on-site, the Contractor shall notify the Engineer and arrange for an on-site inspection.

The entrance shall be maintained in good condition and repaired as necessary by the Contractor during the construction phases as directed by the Engineer.

B. Materials and Methods

1. The entrance areas shall be cleared and stripped of all vegetation, roots and other objectionable material prior to installation of the access way as specified.
2. Provide surface drainage and divert excess runoff to stabilized areas as required and as directed by the Engineer.
3. Traprock - use 1-1/4" traprock concrete equivalent.
4. Thickness - not less than six (6) inches for traprock.
5. Width shall be twelve (12) foot minimum.
6. Filter cloth shall be placed over the entire area prior to placing of stone. Filter cloth shall be as specified below.

Filter cloth underliner shall be suitable for heavy duty construction traffic and have the following minimum properties:

Grab tensile strength	220 lbs.
Elongation at failure	220%
Mullen Burst Strength	430%
Puncture Strength	125 lbs.
Equivalent opening size	40-80 mm

Filter cloth shall be Trevira Spunbound 1135, Mirafi 600x, or approved equal.

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7. Surface water - All surface water flowing or diverted toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.
8. Maintenance - the entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
9. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
10. Periodic inspection and needed maintenance shall be provided after each rain.
11. After completion of the project, the stabilized construction entrance shall be removed and regraded to its original condition. Prior to grading and planting, the area shall be tilled to lessen the compaction of the soils.

C. Maintenance

1. Maintenance of the stabilized construction entrance will include periodic inspection of the surface condition. Top dress with new gravel as needed. Any areas producing sediment should be treated immediately.
2. After completion of the project, the stabilized construction entrance shall be removed and the areas regraded to their original elevations. Prior to seeding and planting, the areas shall be tilled to lessen the compaction of the soils.
3. For those stabilized construction entrances that are in the beds of accessways, the traprock can stay in place for use in accessways. (See specification for accessways.)

D. No Separate Payment

No separate payment will be made for the work of furnishing the material, labor and equipment necessary to construct the stabilized construction entrance in accordance with the plans and specifications and the direction of the Engineer. Separate payment will however be made for all trees removed during the construction of the stabilized construction entrance. Payment for tree removal shall be in accordance with the Detailed Specifications for Tree Removal and Disposal.

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7.510

PORTABLE SEDIMENT TANK

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7.511

STORM DRAIN - INLET PROTECTION MEASURES

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7.512 DIRTBAG

A. Description of Work

The Contractor shall furnish all materials, labor and equipment necessary to install the Dirtbags specified herein and as shown on the Contract Drawings.

Dirtbag is a fabric bag through which sediment laden water is pumped to trap and retain sediment. The Dirtbag is available from Erosion Control Technologies, Inc., ACF Environmental, or approved equal. The purpose of the Dirtbag is to prevent the silting of wetlands by trapping and retaining sediment prior to pumping the water to drainage ways, surrounding properties, and storm sewers.

B. Location

The Dirtbag shall be added to the portable sediment tank at the tanks discharge point. The Dirtbag can either be placed within the sediment trap or sediment basin near the inlet so that effluent from the bag flows into the trap or basin. This will serve to reduce the amount of sediment that enters the trap/basin, and provide for effective collection and disposal of sediment.

C. Specifications

<u>Properties</u>	<u>Test Method</u>	<u>Units</u>	<u>Woven 2016</u>	<u>Nonwoven</u>		
				<u>4551</u>	<u>4553</u>	<u>4555</u>
Weight	ASTM D-3776	oz./yd	8	6	8	10
Grab Tensile	ASTM D-4632	lbs.	300	150	200	270
Puncture	ASTM D-4833	lbs.	120	90	130	150
FlowRate	ASTM D-4491	Gal/Min/ft ²	40	130	80	70
Permittivity	ASTM D-4991	sec ⁻¹	0.55	1.9	1.5	1.3
UV Resistance	ASTM D-4355	%	80	70	70	80

D. Methods/Maintenance/Disposal

The flow pumped to the dirtbag should not exceed a rate of 750 gallons per minute, or as directed by the engineer.

Dirtbags shall be replaced when they observed to be half full or as directed by the engineer.

The Contractor shall be responsible for the disposal of the Dirtbag off-site.

E. Measurement and Payment

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The quantity to be paid for under this time shall be the number of Dirtbags placed in accordance with the Plans and Specifications to the satisfaction of the Engineer, measured in number of above items at the site of the work.

The Contract price per each Dirtbag shall be as indicated on the BID SCHEDULE OF PRICES, Item No. BMP-7.512. The bid price shall be a unit price per Dirtbag and shall include the cost of all labor, materials and equipment necessary to furnish, place and incorporate and all other work incidental thereto, in accordance with the Plans and Specifications to the satisfaction of the Engineer.

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7.513

SURFACE WATER COLLECTOR

NO TEXT ON THIS PAGE

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7.514

TEMPORARY WATER BARRIER

NO TEXT ON THIS PAGE

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7.515

JERSEY BARRIER

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7.516

TURBIDITY CURTAIN

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7.517 SLOPE STABILIZATION MATA. Description of Work

The Contractor shall provide all material, labor, and equipment necessary to furnish and install slope stabilization matting as specified and shown on the Contract Drawing.

B. Material

- The slope stabilization mat shall be manufactured by Presto Geoweb or approved equal and shall meet the following requirements:

Property	Description	Test Method
Material composition	Polyethylene (density=58.4-60.2 lb/ft ³ or 0.935-0.965 g/cm ³)	ASTM D 1505
Stabilizer	Hindered amine light stabilizer (HALS) 1.0% by weight of carrier	N/A
Minimum ESCR	5000 hr	ASTM D 1693
Sheet Thickness	50 mil -5% +10% (1.27 mm -5% +10%)	ASTM D 5199
Texture and Perforation	Peak friction angle between the surface of the textured/perforated plastic and #40 silica sand at 100% density \geq 85% of the peak friction angle of the silica sand in isolation when tested by direct shear method	ASTM D 5321

- The slope stabilization mat shall be textured with diamond-shaped indentations that have a surface density of 140-200 per in² (22-31 per cm²).
- The slope stabilization mat shall also be perforated with horizontal rows of 0.4 in (10 mm) diameter holes.
- The polyethylene cells shall have a 6-inch depth (150 mm) and a 480 lbf (2130 N) minimum certified cell seam strength.
- A long term seam peel-strength test shall be performed on the slope stabilization mat. A 4.0-inch (100 mm) wide seam sample shall support a 160 lb (72.5 kg) load for a minimum period of 168 hours in a temperature controlled environment. The sample shall undergo a temperature change on a 1-hour cycle from ambient room temperature (per ASTM E 41) to 130°F (54°C).
- The slope stabilization mat supplier shall provide data showing the high-density polyethylene resin used to produce the mat can survive a loading of at least 209 lbf (95 kg) for a minimum of 10,000 hours.

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This data shall be based on a sufficient number of samples and varying loads.

C. Installation

1. The slope stabilization mat sections shall be anchored to resist sliding. Anchors shall consist of #4 rebar driven into the matting.
2. When stabilizing the sides of an earth berm, the mat shall extend to the permanent pool water surface elevation. After installing the slope stabilization mat, the mat indentations shall be filled with compacted soil, covered in a 3-inch layer of topsoil, and vegetated per the Contract Drawing. Erosion control mats (see Specification 7.705) shall be used to prevent erosion undermining of the berm prior to establishing vegetation.
3. For stabilization and load support on a maintenance access road, the subgrade soil shall be compacted to a minimum 98 percent standard proctor. After laying the geotextile fabric, provide a two-inch sand bed (see Specification 7.418). Install the slope stabilization mat on top of the sand and place the infill gravel (see Specification 7.305) to two inches above the cell walls. Compact the gravel to 95 percent standard proctor and install the gravel top base.

D. Measurement and Payment

The quantity to be paid for under this item shall be the square footage of slope stabilization matting installed in accordance with the Plans and Specifications to the satisfaction of the Engineer.

The contract unit price per square foot of slope stabilization mat installed shall be as indicated on the BID SCHEDULE OF PRICES Item No. 7.517. The unit bid price per square foot of slope stabilization mat installed shall constitute full compensation for all labor, material, and equipment and incidental expenses necessary to complete the work as shown on the contract drawings and in accordance with the specifications to the satisfaction of the Engineer. When the matting is installed under and adjacent to a maintenance access road, the installation and materials required for the maintenance access road shall be paid under that item number.

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PERIMETER SITE SECURITY/ACCESS CONTROL MEASURES

7.600 WORK INCLUDED

Under Perimeter Site Security and Access Control Measures, the Contractor shall provide all labor, material, tools and equipment necessary to complete the execution of the work in complete accordance with the Specifications and all Contract Drawings. The work shall include items of work specified under the following sections.

<u>Section Number</u>	<u>Title</u>
7.602	Boulder Provision and Placement
7.603	Fixed and Removable Steel Pipe Bollards
7.605	Sign Installation on Steel Rail Posts
7.606	Permanent Access Way
7.607	Temporary Herbivore Exclusion Fence
7.608	Survey Bollards and Survey Monuments
7.618	Surveying Services for Location of Boundary Points
7.620	Aluminum Pipe Railing
7.622	Forebay Micropool Sediment Clean-out Indicator

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7.601C STEEL BACKED TIMBER GUIDE RAIL

NO TEXT ON THIS PAGE

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7.602 BOULDER PROVISION AND PLACEMENTA. Description of Work

Under this item, the Contractor shall furnish all material, labor and equipment necessary to place boulders throughout the contract area in accordance with the contract drawings and specifications as directed by the Engineer. In addition, the contractor will also furnish and deliver boulders as directed by the Engineer.

B. Materials and Construction Methods

Boulders are stones with a diameter between 36" to 42" or 42" to 48" or as shown in the Contract Drawings.

Unless otherwise directed, the Contractor shall excavate a depression as directed by the Engineer prior to setting each boulder in place, in order to achieve a more natural appearance.

The Contractor shall carefully protect all trees, shrubs and other growth to remain and shall be liable for all damages to property caused by boulder placement operations. All trees, plants and other property damaged by boulder placement operations shall be replaced or restored to their original condition to the satisfaction of the Engineer at no additional cost to the City.

1. Perimeter Boulder Placement: Boulders shall be placed along portions of the site perimeter to secure accessible segments. Boulders shall be set roughly parallel to the edge of road. Boulder locations shall be worked into and around existing plantings and natural features; any conflicts shall be brought to the attention of the Engineer prior to boulder placement. All boulder locations shall be marked out and shall be approved by the Engineer prior to placement.
2. Clump/Gap Design: Boulders shall be laid out roughly parallel to the edge of road, between two (2) feet and six (6) feet from road edge. Boulders shall be set in groups or "clumps" where vehicular accessibility into site exists as directed by the Engineer. Stone quantities per clump shall range between three (3) and eight (8). The groupings shall be connected by boulders placed in a single row between the clumps, hence forming "gaps". Existing natural features and vegetation located along the site perimeter shall also be incorporated as gaps. Spaces between boulders or between incorporated trees and boulders shall not exceed four (4) feet.
3. Single Row Design: Boulders shall be laid out roughly parallel to the edge of road, between two (2) feet and four (4) feet from road

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edge. Boulders shall be set in a single row. Spaces between boulders or between incorporated trees and boulders shall not exceed four (4) feet.

4. Stream Placement: Boulders are to be sporadically placed in and along the streams according to the drawing and as per the Engineer.
5. Cascade Perimeter: Boulders are placed in a row along the perimeter of the granite cascades as set and spaced according to the drawings and as per the Engineer.

Boulders shall be set in locations where they will achieve the intended design function, and shall be placed so as to harmonize with existing natural features and appear naturally set. All boulder locations shall be approved by the Engineer prior to placement.

C. Delivery

The Contractor shall furnish and deliver unused boulders to the following address:

DEP Staten Island Bluebelt
182 Joline Avenue
Staten Island, NY 10307
718-984-0489
718-984-4430 (fax)

D. Measurement and Payment

The quantity to be paid for under this item shall be the number of approved boulders placed and incorporated in the completed work in accordance with the plans and specifications to the satisfaction of the Engineer.

The contract price per boulder furnished and installed shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.602. The bid price shall be a unit price per boulder and shall include the cost of all labor, materials and equipment necessary to furnish, place and incorporate and all other work incidental thereto, in accordance with the plans and specifications to the satisfaction of the Engineer.

The contract price per boulder furnished and delivered shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.602A. The bid price shall be a unit price per boulder and shall include the cost of all labor, materials and equipment necessary to furnish and deliver boulders, in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.602 FIXED AND REMOVABLE STEEL PIPE BOLLARDSA. Description of Work

Under this item, the Contractor shall furnish, erect and powder coat steel pipe bollard, fixed or removable in accordance with the plans, specifications and directions of the Engineer.

B. Materials

Steel pipe bollard shall be as manufactured by All City Play Equipment, Brooklyn, New York; Boundary Fence, Jamaica, New York; TrafficGuard Direct, Geneva, Illinois or approved equal.

All fittings and hardware shall be of the materials listed in the following schedule:

<u>Post Caps:</u>	Malleable iron - 3/16" thick
<u>Drive Pins and Set Screws:</u>	Stainless steel
<u>Flange:</u>	Pressed steel
<u>"U" Bolts:</u>	Pressed steel, extra heavy

Malleable iron castings shall be hot dipped galvanized in accordance with ASTM A153 and powder coated per this Specification.

Pressed steel fittings and appurtenances shall be powder coated and hot dipped galvanized in accordance with ASTM A123.

Posts: Posts shall be extra heavy galvanized steel pipe, 3.5" O.D. and shall conform to ASTM A120, Schedule 80 except that pipe shall be unthreaded and untested for water pressure.

Sleeves: Sleeves shall be standard weight galvanized steel pipe, 4" I.D. and shall conform to ASTM A120, Schedule 40 except pipe shall be unthreaded and untested for water pressure.

Padlocks: Four (4) padlocks shall be furnished for each removable bollard. The padlocks shall be American No. 5571 as manufactured by American Lock Company of Crete, Illinois; Yale Global-USA of Lenoir City, TN; The Wilson Bohannon Lock Company of Marion, OH; or approved equal. All padlocks shall be keyed alike with two (2) inch width 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-eighths (3/8) inch diameter and two (2) inch clearance (elongated shackle). The locks shall be keyed for NYC Fire Department No. 1620 keys. The Contractor shall furnish two (2) keys for each padlock.

C. Erection

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The posts for fixed bollards shall be set in concrete footings as shown on the plans 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 plans or as directed by the Engineer.

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.

D. Powder Coating

The galvanized steel pipe and fittings shall be powder coated with TGIC-Polyester.

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.

The powder coating shall be applied to the galvanized pipe and fittings in such a manner that the coating will not peel off. Insure surfaces to be coated are clean and dry and free of grease, dust, rust, etc. All coated parts shall first receive phosphating and chromating treatments to improve the adhesion of the surface coating. Color to be black unless otherwise indicated on the plans.

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.

Laboratory Tests for TGIC-Polyester Powder Coat: At the discretion of the Engineer, a sample TGIC-Polyester powder coated bollard 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.

Touch-up and Repair: For minor damage 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

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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.

E. Submissions

Shop Drawings: Before the work is started, the Contractor shall submit shop drawings for approval by the Engineer.

F. Measurement and Payment

The quantity of Steel Pipe Bollard - Fixed and Steel Pipe Bollard - Removable to be paid for under these items shall be the total number furnished and installed in accordance with the plans, specifications and directions of the Engineer.

The contract price for steel pipe bollard fixed and removable shall be as indicated on the BID SCHEDULE OF PRICES, Item Nos. BMP-7.603A and BMP-7.603B, respectively. The bid price shall include the cost for all labor, material, equipment and incidental expenses necessary to complete the work, including excavation, average concrete and powder coating, all in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.603 FIXED AND REMOVABLE STEEL PIPE BOLLARDS

A. Description of Work

Under this item, the Contractor shall furnish, erect and powder coat steel pipe bollard, fixed or removable in accordance with the plans, specifications and directions of the Engineer.

B. Materials

Steel pipe bollard shall be as manufactured by All City Play Equipment, Brooklyn, New York (718-258-9600); Boundary Fence, Jamaica, New York (718-847-3400) or approved equal.

All fittings and hardware shall be of the materials listed in the following schedule:

<u>Post Caps:</u>	Malleable iron - 3/16" thick
<u>Drive Pins and Set Screws:</u>	Stainless steel
<u>Flange:</u>	Pressed steel
<u>"U" Bolts:</u>	Pressed steel, extra heavy

Malleable iron castings shall be hot dipped galvanized in accordance with ASTM A153 and powder coated per this Specification.

Pressed steel fittings and appurtenances shall be powder coated and hot dipped galvanized in accordance with ASTM A123.

Posts: Posts shall be extra heavy galvanized steel pipe, 3.5" O.D. and shall conform to ASTM A120, Schedule 80 except that pipe shall be unthreaded and untested for water pressure.

Sleeves: Sleeves shall be standard weight galvanized steel pipe, 4" I.D. and shall conform to ASTM A120, Schedule 40 except pipe shall be unthreaded and untested for water pressure.

Padlocks: Four (4) padlocks shall be furnished for each removable bollard. The padlocks shall be American No. 5571 as manufactured by American Lock Company of Crete, Illinois (871-361-1040) or approved equal. All padlocks shall be keyed alike with two (2) inch width 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-eighths (3/8) inch diameter and two (2) inch clearance (elongated shackle). The locks shall be keyed for NYC Fire Department No. 1620 keys. The Contractor shall furnish two (2) keys for each padlock.

C. Erection

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The posts for fixed bollards shall be set in concrete footings as shown on the plans 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 plans or as directed by the Engineer.

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.

D. Powder Coating

The galvanized steel pipe and fittings shall be powder coated with TGIC-Polyester.

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.

The powder coating shall be applied to the galvanized pipe and fittings in such a manner that the coating will not peel off. Insure surfaces to be coated are clean and dry and free of grease, dust, rust, etc. All coated parts shall first receive phosphating and chromating treatments to improve the adhesion of the surface coating. Color to be black unless otherwise indicated on the plans.

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.

Laboratory Tests for TGIC-Polyester Powder Coat: At the discretion of the Engineer, a sample TGIC-Polyester powder coated bollard 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.

Touch-up and Repair: For minor damage 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

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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.

E. Submissions

Shop Drawings: Before the work is started, the Contractor shall submit shop drawings for approval by the Engineer.

F. Measurement and Payment

The quantity of Steel Pipe Bollard - Fixed and Steel Pipe Bollard - Removable to be paid for under these items shall be the total number furnished and installed in accordance with the plans, specifications and directions of the Engineer.

The contract price for steel pipe bollard fixed and removable shall be as indicated on the BID SCHEDULE OF PRICES, Item Nos. BMP-7.603A and BMP-7.603B, respectively. The bid price shall include the cost for all labor, material, equipment and incidental expenses necessary to complete the work, including excavation, average concrete and powder coating, all in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.604

BLACK CHAIN LINK FENCE

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7.605 SIGN INSTALLATION ON STEEL RAIL POSTSA. Description of Work

Under this item, the Contractor shall provide all labor, materials, equipment, testing and incidentals required to furnish and install the temporary signs on construction limit fence, new rigid aluminum permanent Bluebelt Identification signs and Adopt-A-Bluebelt signs on steel sign posts, and furnish and deliver replacement Bluebelt Identification signs as required in this Contract and in accordance with the plans, specifications and directions of the Engineer.

B. Materials and Construction Methods

All steel sign posts shall be rolled from material meeting ASTM A847 High Strength Low Alloy Steel Pipe and Tube, with a weathered steel finish.

All posts shall be of a uniform, modified, flanged channel section such that the area of contact between the post and the sign is symmetrical with the vertical axis of both the sign and posts. The posts shall be 2-3/8" round posts.

The length of each steel sign post shall be 14'.

The finished posts shall be machine straightened and have a smooth, uniform finish free from cracks, flaws, injurious seams, blisters, ragged, sharp and imperfect edges or other defects affecting strength, durability, or appearance.

All steel sign posts furnished under this Contract shall be packed and delivered in such a manner that no injury or defacement may occur to the finished unit.

C. Steel Rail Installation

The area for concrete footing shall be excavated to the dimensions shown on the drawings. The footing shall be dug with a power auger, post hole digger or as directed by the Engineer.

The steel railing sign post shall be set and centered in the hole, to the elevation shown on the drawings which shall have been previously excavated. After the post has been set and properly supported to hold it true and plumb, the hole shall be filled with concrete. The concrete footing for the steel rail sign post shall be constructed from 3,000 psi strength concrete.

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The Contractor shall take every precaution to safeguard against damage or injury to all existing utilities, structures, adjacent trees, shrubs and natural features to remain. Any damage or injury incurred shall be remedied by the Contractor at no cost to the City and to the satisfaction of the Engineer.

D. Signage Installation

Following installation of the steel rail sign posts, the Contractor shall install the rigid aluminum BMP Identification Signs on the steel rail sign posts in accordance with the contract drawings.

Two (2) sets of replacement fasteners shall be supplied to the Bluebelt Field Office located at 182 Joline Avenue for each sign installed.

The Contractor shall remove any excess material, debris, litter, etc., used for or remaining from the installation work area.

E. Furnish Temporary (During Construction) Flexible Aluminum Signs, 0.020" Gauge Aluminum & Install on Construction Limit Fence

1. Description of Work

Under this item, signs furnished shall be new aluminum, not previously used as a sign, with white vinyl sheeting. The appropriate lettering and graphics shall be silk screened onto the vinyl sheeting.

The Contractor shall provide all labor, materials, equipment, testing and incidentals required to furnish new signs and install the temporary (during construction) flexible aluminum signs on the construction limit fence and/or reinforced silt fence, in accordance with the plans, specifications and directions of the Engineer. The Contractor will be responsible for maintaining the signs on the fencing for as long as the adjacent street is an active construction site. In order to do this, the Contractor will replace as necessary. For each sign installed, the Contractor will supply one replacement sign to the DEP Bluebelt office located at 182 Joline Avenue. All leftover signs after the project is over will also be delivered to 182 Joline Avenue.

2. Materials and Methods

Signs shall be made of flat, unpainted aluminum, Alloy 6063-T5, 0.020" thick. The sign dimensions shall be 14" x 8-1/2". Each sign shall be cut from one piece of aluminum, and shall be free of wind buckle, dents, twists. The face of each sign shall be substantially a

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plane surface. All edges and corners shall be filed or ground smooth, so that the sign shall be free from sharp edges and burrs. Welded or jointed signs will not be accepted. The Contractor shall install signs every fifty (50) feet on reinforced silt fence and on construction limit fence.

Signage shall be as manufactured by the Walter Sign Corporation, 36-35 36th Street, Long Island City, N.Y. 11106, Telephone: (718) 784-7777, or Sign Designers of New York, Inc., 33-26 Northern Boulevard, Long Island City, N.Y., Telephone: (718) 392-0779 or approved equal.

3. Cleaning Treatment:

Each sign shall be prepared by the manufacturer as follows:

- a. Initial cleaning of all blanks shall be by complete submersion in a three percent (3%) solution of an inhibited alkaline cleaner at 160 to 180 degrees Fahrenheit for three (3) minutes, followed by a rinse with clean, cold running water. Alternatively, a grease solvent such as Naptha or Trichlorethylene may be used, when the application is in accordance with the directions of the manufacturer of the cleaner product.
- b. Secondary cleaning shall follow preliminary cleaning by immersion for one (1) minute in circulating hot water at 180 degrees Fahrenheit. Each sign shall then be dried by forced warm air. Alternatively, the clean sign blank may be prepared by the process conforming to military specifications MIL-C-5541, such as Alodine or approved equal. If a chemical conversion coating is employed, the coating shall be free of all powder residue.
- c. Following preliminary cleaning, the sign blanks shall be handled only by mechanical means or with gloved hands.
- d. All aluminum sheets shall be guaranteed to maintain flatness when exposed to 340 degrees for ten (10) minutes.

4. Vinyl Sheeting

Vinyl sheeting shall be either Type I, Class I, pressure sensitive adhesive or Type III, Class I, heat activated adhesive conforming to Military Specifications MIL-M-43719B.

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Apply the vinyl sheeting to the treated sign in accordance with the manufacturer's specifications.

Durability of sheeting shall provide for a minimum of 10 years of useful life in the climatic conditions existing in New York under normal, vertical, exterior street sign exposure when applied in accordance with the manufacturer's recommendations.

5. Lettering:

The signs shall be inscribed by means of a silk screen process with the borders, lettering, and graphics as indicated on the Contract Drawings.

When vandal resistant inks, compatible with the vinyl sheeting, are available and are recommended by the sheeting manufacturer, these inks shall be used. Vandal resistant inks shall be applied in accordance with the manufacturer's specifications.

The colors shall be blue and green lettering and graphics on a white baked enamel background in accordance with the Contract Drawings and to the satisfaction of the Engineer. Colors shall correspond as follows: Green PMS 355 and Blue PMS 287.

Lettering shall be the font styles and point sizes as represented on the Contract Drawings or approved substitute fonts and sizes.

6. Sign Layout

Layout of the sign shall be in accordance with the Contract Drawings and to the satisfaction of the Engineer.

7. Finish

The finished sign shall be clear coated, with a Finishing Clear, unless the manufacturer of the sheeting recommends that the sign not be coated. The Finishing Clear shall be compatible with the sheeting and applied in accordance with the specifications of the manufacturer of the vinyl sheeting. When clear coating is optional the sign shall be clear coated. When the manufacturer of the sheeting recommends a vandal resistant Finishing Clear or vandal overlay, the Finishing Clear or overlay shall be used and applied in accordance with the manufacturer's specifications. Vandal resistant inks will not be required when vandal resistant Finishing Clear or overlay is used.

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The finished sign shall be uniform in color and tone, with sharply defined edges and borders and without blemishes on the sign background that will affect sign use.

The sign surface shall be readily refurbished by cleaning and clear overcoating in accordance with the manufacturer's recommendations.

8. Provision of Sign Mock-Up

The Contractor shall provide one full-size sign as a mock-up, to the Engineer for approval, prior to production of the required number of signs. The Contractor shall not begin sign production until the Engineer has given approval in writing. Any corrections required to make the mock-up in conformance with these specifications and Contract Drawings shall be done at the Contractor's expense.

9. Time of Performance

The temporary flexible aluminum sign will be installed on the snow fencing with hay bales before sewer construction proceeds in the adjacent street or not later than fifteen (15) days after the date of the Notice to Proceed letter sent by the Engineer whichever is first.

10. Measurement and Payment

The quantity of 0.020" Gauge Aluminum Signs to be paid for under this item shall be the total number of signs fabricated and installed at the designated locations or delivered to DEP, in accordance with the plans, specifications and directions of the Engineer.

The contract price per 0.020" Temporary Sign shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.605-B. The unit price shall include the costs of all labor, materials, equipment and incidental expenses necessary or required to complete the work in accordance with the plans and specifications and to the satisfaction of the Engineer.

F. Furnish Permanent Bmp Id, Watershed Id and Adopt-A-Bluebelt Rigid Aluminum Signs, Furnish Permanent Watershed ID Replacement Signs

1. Description of Work

Under this item, signs furnished shall be new 0.080" gauge aluminum, not previously used as a sign, with white vinyl sheeting.

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The appropriate lettering and graphics shall be silk screened onto the vinyl sheeting.

The Contractor shall provide all labor, materials, equipment, testing and incidentals required to furnish and store new BMP Identification, Watershed Identification and Adopt-A-Bluebelt signs in accordance with the plans, specifications and directions of the Engineer. The Contractor shall supply five replacement Identification signs to the DEP Bluebelt Field Office, located at 182 Joline Avenue. No Adopt-A-Bluebelt or BMP Identification replacement signs shall be provided. Replacement signs shall be provided to at no additional cost to the City.

2. Materials and Construction Methods

Signs shall be made of flat, unpainted Aluminum, Alloy 6061-T6, 0.080" thick. The Adopt-A Bluebelt signs shall be 24" x 38.4". The BMP ID and Watershed ID signs shall be 12" x 15". Each sign shall be cut from one piece of aluminum, and shall be free of wind buckle, dents, and twists. The face of each sign shall be substantially a plane surface. All edges and corners shall be filed or ground smooth, so that the sign shall be free from sharp edges and burrs. Welded or jointed signs will not be accepted. The sign blanks shall be cut and drilled in accordance with the Contract Drawings. Holes shall be drilled in the following manner: each rigid aluminum sign shall receive a 5/16" diameter hole at the centerline of the sign 0.25" from the top and a 5/16" diameter hole at the centerline of the sign 0.25" from the bottom of the sign. To permit interchangeability of signs on existing and new sign posts, the distance between drilled holes must be accurately maintained.

Signage shall be as manufactured by Sign Designers of New York, Inc., 33-26 Northern Boulevard, Long Island City, N.Y., Telephone: (718) 392-0779, or Walter Sign Corporation, 36-35 36th Street, Long Island City, N.Y. 11106, Telephone: (718) 784-7777, or approved equal.

Signs shall be affixed to the sign post using two center mounted sign brackets, with a 4 1/2" sign support, as per Contract Drawings. All hexbolts shall be 5/16" diameter, stainless steel material.

3. Cleaning Treatment

Each sign shall be prepared by the manufacturer as follows:

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- a. Initially, clean all blanks by complete submersion in a three percent (3%) solution of an inhibited alkaline cleaner at 160 to 180 degrees Fahrenheit for three (3) minutes, followed by a rinse with clean, cold running water. Alternatively, a grease solvent such as Naptha or Trichlorethylene may be used, when the application is in accordance with the directions of the manufacturer of the cleaner product.
 - b. Secondary cleaning shall follow preliminary cleaning by immersion for one (1) minute in circulating hot water at 180 degrees Fahrenheit. Each sign shall then be dried by forced warm air. Alternatively, the clean sign blank may be prepared by the process conforming to military specifications MIL-C-5541, such as Alodine or approved equal. If a chemical conversion coating is employed, the coating shall be free of all powder residue.
 - c. Following preliminary cleaning, the sign blanks shall be handled only by mechanical means or with gloved hands.
 - d. All aluminum sheets shall be guaranteed to maintain flatness when exposed to 340 degrees for ten (10) minutes.
4. Vinyl Sheeting:
- a. Vinyl sheeting shall be either Type I, Class I, pressure sensitive adhesive or Type III, Class I, heat activated adhesive conforming to military specifications MIL-M-43719B.
 - b. Apply the vinyl sheeting to the treated sign in accordance with the manufacturer's specifications.
 - c. Durability of sheeting shall provide for a minimum of 10 years of useful life in the climatic conditions existing in New York under normal, vertical, exterior street sign exposure when applied in accordance with the manufacturer's recommendations.
5. Lettering
- a. The signs shall be inscribed by means of a silk screen process with the borders, lettering, and graphics as indicated on the Contract Drawings.

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- b. When vandal resistant inks, compatible with the vinyl sheeting, are available and are recommended by the sheeting manufacturer, these inks shall be used. Vandal resistant inks shall be applied in accordance with the manufacturer's specifications.
- c. For all signs, the colors shall be blue lettering and graphics on a white baked enamel background except where indicated, in accordance with the Contract Drawings and to the satisfaction of the Engineer. Colors shall be Blue PMS 287.
- d. Lettering shall be the font styles and point sizes as represented on the Contract Drawings or approved substitute fonts and sizes.

6. Sign Layout

- a. Layout of the sign shall be in accordance with the Contract Drawings and to the satisfaction of the Engineer.

7. Finish

- a. The finished sign shall be clear coated, with a Finishing Clear, unless the manufacturer of the sheeting recommends that the sign not be coated. The Finishing Clear shall be compatible with the sheeting and applied in accordance with the specifications of the manufacturer of the vinyl sheeting. When clear coating is optional the sign shall be clear coated. When the manufacturer of the sheeting recommends a vandal resistant Finishing Clear or vandal overlay, the Finishing Clear or overlay shall be used and applied in accordance with the manufacturer's specifications. Vandal resistant inks will not be required when vandal resistant Finishing Clear or overlay is used.
- b. The finished sign shall be uniform in color and tone, with sharply defined edges and borders and without blemishes on the sign background that will affect sign use.
- c. The sign surface shall be readily refurbished by cleaning and clear overcoating in accordance with the manufacturer's recommendations.

8. Provision of Sign Mock-Up:

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The Contractor shall provide one full-size sign as a mock-up, to the Engineer for approval, prior to production of the required number of signs. The Contractor shall not begin sign production until the Engineer has given approval in writing. Any corrections required to make the mock-up in conformance with these specifications and Contract Drawings shall be done at the Contractor's expense.

9. Delivery of Replacement and Left-Over Signs

After all signs required for this project are installed, the Contractor shall deliver all replacement and left-over signs to the following location:

DEP Staten Island Bluebelt Field Office
182 Joline Avenue
Staten Island, New York 10307
718-984-0489
718-984-4430 (fax)

The signs shall be packaged so as to prevent scratching, bending or other damage while they are being shipped and stored. DEP reserves the right to inspect and reject any damaged signs. The Contractor will supply five replacement Watershed Identification signs to the DEP Bluebelt Field Office. No BMP Identification or Adopt-A-Bluebelt replacement signs shall be provided.

10. Time of Performance:

The Contractor shall supply all the signs not later than fifteen (15) days after the date of the Notice to Proceed Letter sent by the Engineer.

11. Packaging and Storage:

The signs shall be packaged and stored so as to facilitate their proper handling and storage until such time the Contractor can install them on the steel rail sign posts.

12. Measurement and Payment

The quantity of 0.080" Gauge Aluminum Signs to be paid for under this item shall be the total number of signs, fabricated and installed on steel rail posts or delivered in accordance with the plans, specifications and directions of the Engineer. All extra signs not installed shall be delivered to the DEP Bluebelt Field office on Staten Island at no extra cost to the City.

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The contract price per 0.080” Permanent Sign installed on Steel Post shall be as indicated on the BID SCHEDULE OF PRICES: Item No. BMP-7.605-A.

The contract price per replacement 0.080” Permanent Sign furnished and delivered shall be as indicated on the BID SCHEDULE OF PRICES as follows:

Item	Description
BMP-7.605A	PERMANENT SIGNS ON STEEL RAIL POST
BMP-7.605B	0.020” TEMPORARY SIGNS

The unit price shall include the costs of all labor, materials, equipment, installation and incidental expenses necessary or required to complete the work in accordance with the plans and specifications and to the satisfaction of the Engineer.

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7.606 PERMANENT ACCESSWAY WITH CONCRETE PAVERS OR GRAVEL

A. Description of Work

The Contractor shall provide all labor, materials, tools and equipment necessary to complete the permanent accessways as shown in the Contract Drawings and as directed by the Engineer.

B. Materials and Methods - Concrete Pavers

1. Pavers

The Permanent Accessway shall be constructed using concrete grid pavers. Unless directed by the Engineer, materials and methods shall conform to ICPI Technical Specification #8. The pavers shall be 23 5/8" x 15 3/4". They shall be made in a grid-like pattern 3 1/8" in height. The Pavement Accessway edges shall be secured with a concrete curb. The pavers and adjoining curb shall be earthtone brown in color. The pavers shall be fabricated of Portland Cement Type II or III fine and course aggregates (ASTM C-33-61) utilizing a steel mesh-6"/6" x 8/8 gauge with an air-entraining agent between 4%-6% (ASTM C-173) achieving a concrete strength of 5,000 psi at 28 days (ASTM C-39-49) and a maximum water absorption of 5% (ASTM C-97). The concrete grid pavers shall be manufactured by Metromont Materials Company or approved equal.

2. Crushed Stone

The crushed stone layer shall consist of 1/2" to 1" stone, with gradation conforming to ASTM D2940.

3. Sand

Sand bedding shall consist of concrete sand, with gradation conforming to ASTM33(6).

4. Filter Cloth

Filter cloth underliner shall have the following minimum properties:

Grab tensile strength	220 lbs.
Elongation at failure	220%
Mullen Burst Strength	430%
Puncture Strength	125 lbs.
Equivalent opening size	40-80 mm

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Filter cloth shall be Trevira Spunbound 1135, Mirafi 600x, or approved equal.

5. Testing

The pavers should be tested and confirm to the following tests:

Compression/Load Test (ASTM C 67 - Adapted)

Samples are to be conditioned at 70°F (21°F) and 50% relative humidity room for 24 hours prior to testing. Cut samples of 12" x 12" were used for this test.

A. Load Tests - Quarter of a full Panel.

Sample No.	Effective Area (sq.in)	Maximum Load (lbs.)	Load Strength Per Unit (PSI)
1	49.00	287,000	5,857
2	49.00	296,000	6,041
3	49.00	322,000	6,571
<i>Average:</i>			6,156

B. Compression Tests - Single Block Unit

Sample No.	Effective Area (sq.in)	Maximum Load (lbs.)	Compression Strength Per Unit (PSI)
1	12.25	68,500	5,592
2	12.25	65,000	5,306
3	12.25	70,000	5,714
<i>Average:</i>			5,537

6. Installation Procedure

- a. Prior to placing a dense-graded base, the soil subgrade or approved fill should be uniformly compacted to at least 95% of standard Proctor density per ASTM D698(4). Remove from the setting bed rock or other materials which would create uneven bearing.

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- b. Install concrete curb along the perimeter outlining the entire area to receive crushed stone and pavers.
- c. A 12 inch deep crushed stone base should then be installed, compacted to a minimum of 98% standard Proctor density (4).
- d. Place sand in a 2" compacted layer over the base to present a true and even grade over entire area to receive pavers.
- e. Set pavers and line up to abut.

7. Void Filler

Thoroughly mix topsoil with fertilizer and spread loosely to fill voids in pavers. Water with a mist spray to settle. Add additional topsoil mix to bring the topsoil flush with top of the paver. Seed at slightly less than normal rate. When grass is 2 1/2" high, cut to 1 3/4".

C. Material and Methods – Gravel

The specifications for permanent gravel accessway shall be the same as those for stabilized construction entrance of this Detailed Specification Section 7.509A.

D. Measurement and Payment

The contract price per square foot for Permanent Accessway with Concrete Pavers shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.606A for gravel and Item No. BMP-7.606B for pavers. No separate payment shall be made for concrete curbing or sub base material used for pavers. The unit price per square foot shall include 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.

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7.607

HERBIVORE EXCLUSION FENCE

NO TEXT ON THIS PAGE

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7.608 SURVEY BOLLARDS AND SURVEY MONUMENTSA. Description

The Contractor shall furnish and install Survey Bollard and Survey Monuments which are used to delineate the boundaries of DEP properties. The Surveying services to determine the location of the Survey Bollards and Monuments is provided under a separate contract item. The general location of the Bluebelt properties to have the Survey Bollards and Survey Monuments to be installed are shown on the Contract Drawings.

B. Materials

1. Survey Bollards – All bollards shall be made of wood. All wood bollards shall be Southern Yellow Pine, No. 1 grade timbers as graded by the Southern Pine Inspection Bureau (SPIB), conforming to the American Softwood Lumber Standards and defined in paragraph 402 of the SPIB grading rules, 1994 edition. Additionally, the following requirements shall be met:

All bollards shall be free of any knots on edges or ends. All bollards shall be free of holes, ring shakes, warp (including bow, cup, crook and twist). Warp is restricted to the "light" category as described in SPIB paragraph No. 752.

The bollards shall be free from wane and bark inclusions and decay. Splits and checks shall not exceed 3/8" in width of more than one-half the length and thickness of the timber. The grain deviation shall not deviate more than 1 in 15.

All wood bollards shall be fabricated in strict accordance with the contract drawings and specifications and shall be dressed to finished dimension of not less than 1/2" below nominal thickness and width. Bollards which measure below 1/2" finished dressed size will be rejected in the field by the Engineer. All edges and ends shall be uniformly eased. The top exposed end shall receive a 1" chamfer in accordance with the contract detail plan drawings. All fabrications shall take place before pressure preservative treatment.

Wooden Bollards shall be manufactured by Boro Lumber & Timber Company, Inc., Maspeth, NY ; Great Southern Wood Preserving, Incorporated, Abbeville, AL; Georgia-Pacific Building Products, Atlanta, GA; or by an approved equal.

Wood Bollards shall be CCA (Chromated copper Arsenate) pressure treated to a maximum retention of 0.40 lbs per cubic foot in

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accordance with the American Wood Preservers' Association (APWPA) Standards C1 and C2. The preservative shall penetrate 2.5" or 85% of the sapwood. The method of preservative treatment shall be in accordance with the latest AWPAs standards.

Each bollard shall be installed plumb and square and to the required height, at the locations specified, and to the satisfaction of the Engineer. After the installation of the bollard is complete, the contractor shall remove all excess excavated material and dispose of off-site. The disturbed area shall be graded and mulched by the Contractor, as directed by the Engineer. No extra payment shall be made for this work.

2. Concrete Property Monuments

The concrete monument shall be dimensioned as shown on the detail on the Contract drawing. The concrete monument shall consist of a concrete shaft 30 inches long with dimensions at the top of five (5) inches and five (5) inches. The dimensions at the bottom of the shaft shall be five (5) inches and six (6) inches, so there shall be a slight taper on one side of the shaft.

The top of each monument shall have an aluminum disk with a diameter of two (2) inches attached to an 18 inch long #4 rebar embedded in the concrete. The concrete shall be class A-40 with a compressive strength of 4,000 psi. The top of the disk shall have text as shown in Attachment E. The following wording shall appear on the top of the disk:

N.Y.C.D.E.P.
MONUMENT
BLUEBELT BOUNDARY

Each disk shall have a cross in the middle marking the exact boundary point, and the number for the monument shall be stamped on the top. The Engineer will instruct the Contractor as to what number the contractor is to stamp on a particular aluminum disk.

The installation of the monument in the field shall consist of digging a hole with a diameter of 12 to 16 inches and a depth of at least 36 inches. The hole shall be filled with cement into which the monument shall be set. The hole shall then be backfilled.

The top of the monument shall be set so that it is flush with existing grade in areas where pedestrians frequent such as sidewalks. This is required so the monument will not become a tripping hazard. If the monument is located in areas without pedestrians, the top of the

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monument shall be elevated 1 to 2 inches above existing grade, so it can be more easily found in the future. In all cases, the concrete part of the top of the monument shall be painted red, omitting the aluminum disk, again for ease of detection. The Engineer shall direct the Contractor in all aspects of monument installation.

As directed the Engineer the monument shall be located at a corner or other point easily identified. If a tree, structure, fence or other obstruction prevents the monument from being located exactly on a line, the surveyor shall provide an 8 ½ x 11 inch sketch indicating what offset from the line was necessary because of the obstruction.

After installation of the monument is complete, the contractor shall remove all excess excavated material and dispose off-site. The Contractor shall also be responsible for a general clean-up of the work-site.

C. Extra Materials

The Contractor shall furnish extra materials and deliver it to the following address:

DEP Staten Island Bluebelt
182 Joline Avenue
Staten Island, NY 10307
718-984-0489
718-984- 4430 (fax)

The extra material shall consist of a five (5) wooden bollards and ten (10) survey monuments that meet all requirements of specification section 7.608. The extra material shall be delivered to the DEP Bluebelt Field Office and a signed receipt (from DEP) shall be submitted to the Engineer to acknowledge DEP's receipt of the forementioned materials. Failure to supply the extra materials shall result in the DEP taking a total credit of three thousand dollars (\$3,000).

D. Measurement and Payment

The quantity to be measured for payment under this section shall be the total number of survey monuments supplied in accordance with the plans and specifications and directions of the Engineer.

The contract price per unit for survey monuments furnished and installed shall be as indicated on the BID SCHEDULE OF PRICES, Item No. BMP-7.608. The bid price shall be a unit price per survey monument, and shall include the cost of all labor, materials, equipment, and all work incidental

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thereto, necessary to complete this item in accordance with the plans and specifications and to the satisfaction of the Engineer.

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7.609

CURB PLATE

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7.610

CURB PLATE INSTALLATION

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7.611

CEDAR SPLIT RAIL FENCE

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7.612

BRONZE PLAQUE

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7.613

SPLIT RAIL FENCE

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7.614

BELGIUM BLOCKS

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7.615

ORNAMENTAL SWING GATE

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7.616

STEEL PANEL FENCE

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7.617

WELDED STAINLESS STEEL PIPE RAIL

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7.618 SURVEYING SERVICES FOR LOCATION OF BOUNDARY POINTSA. Description of Work

Under this item the Contractor shall furnish all materials, labor and equipment necessary to provide surveying services for the location of monument and/or bollards to delineate the boundaries of DEP properties in the Bluebelt. The property monument and/or bollards are supplied and installed under a separate Contract item. The surveying services shall be performed by a New York State Licensed surveyor at the locations indicated on the Contract drawings and as per the direction of the Engineer.

B. Definition of Boundary Point Locating Services

The Contractor shall provide general surveying services as directed by the Engineer for locating a boundary point along the perimeter of some Bluebelt property. Those services shall include all computing, traversing and research necessary to set the boundary point. Once located in the field, the point shall be marked by the Contractor with a wooden stake driven into the ground and surveyor's flags. This work shall be done in close coordination with fencing, or other perimeter security measures to be installed by another contractor. When the other contractor will be installing the perimeter security measures at a specified time, the surveying contractor under this contract shall schedule his/her work just before the perimeter security work.

C. Measurement and Payment

Measurement and Payment shall be on an hourly basis. The hourly rate shall include the services of a three man surveying crew. The Engineer shall be present during the progress of Work and the Engineer shall deem as to whether the Contractor has utilized his crew at the productivity output required to complete the Work as anticipated. The surveyor will submit invoices to the Engineer, which will be forwarded to the Contractor for prompt payment. Payments shall be made for invoiced costs only, with no payment for overhead and profit.

The Contract price for Surveying Services for location of Boundary Points shall be as indicated on the BID SCHEDULE OF PRICES, Item BMP-7.109. The bid price shall be a unit price and shall include the cost of all labor, materials, equipment and work incidental thereto, necessary to furnish this item in accordance with the plans and specification to the satisfaction of the Engineer.

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7.619

HYDRANT UTILITY MARKER

NO TEXT ON THIS PAGE

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7.620 ALUMINUM PIPE RAILINGA. Description of Work

Under this item, the Contractor shall provide all labor, materials and equipment to install Aluminum Pipe Railings, Toe Boards and Self Closing Gates in accordance with the plans, specifications and direction of the Engineer.

B. Materials

1. Extruded Aluminum Architectural and Ornamental Shapes:
ASTM B221, Alloy 6063-T52.

Aluminum Forgings: ASTM B247.

Extruded or Drawn Aluminum Pipe and Tube:

ASTM B429 or ASTM B241, Alloy 6063-T5, 6063-T52 or 6063-T832 as required by loadings, deflections and post spacings specified.

Provide Schedule 40 pipe minimum, unless conditions of detail and fabrication require extra heavy pipe to comply with performance criteria specified.

Provide all rails and posts with minimum outside diameter of 1.900-inches; nominal size of 1-1/2-inches.

2. Reinforcing Bars: Solid 24-inch long 6061-T6 circular cross section aluminum reinforcing bars with outside diameter same as inside diameter of post.

3. Toeboards:

- A. Provide extruded ASTM B429 6063-T5 or T52 alloy aluminum toeboards, unless railing is mounted on curbs or other construction of sufficient height and type to meet the requirements of 29 CFR 1910.23. Bars or plates are not acceptable and shall not be approved by Engineer.

- B. Unless otherwise specified, toeboards shall meet requirements of 29 CFR Part 1910.23, Section (e).

- C. Securely fasten toeboard in place with not more than 1/4-inch clearance above floor level. Provide for thermal expansion and contraction in toeboards over the entire

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range of temperatures specified. Thermal movement shall not cause warping or buckling of toeboards.

- D. Provide manufacturer's toeboard detail which accommodates storage for removable socket covers.

4. Anchors and Fastenings:

- A. Type 316 stainless steel.
- B. Provide minimum of four bolt fasteners per post where surface mounted posts are shown. Components shall be in accordance with manufacturer's recommendations and as acceptable to Engineer as shown on approved Working Drawings.
- C. Anchors shall be of stainless steel Type 316 and a minimum size of 1/2-inch diameter.

5. Hardware and Components

- A. Castings:
 - 1. Provide high strength aluminum alloy brackets, flanges and fittings suitable for anodizing as specified.
 - 2. Aluminum-Alloy Sand Castings: ASTM B26.
- B. Concealed Connector Sleeves: Schedule 40, 5-inches long by 1.610-inches diameter.
- C. Brackets and Flanges: Provide manufacturer's complete selection of standard and custom brackets and flanges for railing posts and for handrail supports.
- D. Sockets: Provide 6-inch deep by 2-1/2-inch outside diameter aluminum sockets with 3-1/2-inch wide socket

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- cover on bottom of all sockets and on top and bottom of removable post sockets.
- E. Hinges: Provide two self-closing aluminum hinges for each railing system gate.
- F. Railing Gate: A self closing railing safety gate with adjustable stops. Provide all accessory items and systems components out of Aluminium Pipe.
- G. Gate Latches and Stops: Provide one latch and stop with rubber bumper and 1-inch diameter plastic knob for each railing system gate.
- H. Chain, Snaps and Eye Bolts: Provide oblong 0.250-inch aluminum link, Type 316 stainless steel chain weighing 57 pounds per cubic foot, each link 1-1/8-inch by 7/16-inch. Provide stainless steel eyebolts, 1/4-inch stainless steel threaded quick links and heavy duty swivel snaps with spring loaded latch.
- I. Custom Cover Flanges: Provide 1/4-inch high by 4-inch diameter aluminum cover flanges for all non-removal posts and 3-1/2-inch wide by 1-1/8-inch high aluminum pipe collars with 1/4-inch set screws for all removable posts.
- J. Auxiliary System Components and Miscellaneous Accessories: Provide a complete selection of manufacturer's standard and custom aluminum handrail and railing components and miscellaneous accessories including, but not limited to, fascia flanges, post brackets, interlocking panel clips, clamps, end caps, post caps, adapters and similar items.
- K. Adhesive: Two-part waterproof epoxy-type as recommended by railing and handrail manufacturer.
- L. Non-Shrink, Non-Metallic Grout:
1. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and is recommended by the manufacturer for exterior use.
 2. Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous, cementitious grout,

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complying with ASTM C1107, requiring only the addition of water at the Site.

M. Fastening to In-Place-Construction

1. General: Do not erect components which have become scarred, dented, chipped, discolored or otherwise damaged or defaced. Railing and handrail system components which have holes, cuts, gouges, deep scratches or dents of any kind shall be removed from the site before installation. Repairs to correct such work shall not be approved by the Engineer. Remove and replace with new material.
2. Post and rail sections shall be brought into final alignment by aluminum pipe railing installer.
3. Provide anchorage devices and fasteners where necessary for securing railing and handrail items to in-place construction, including threaded fasteners for concrete and masonry inserts, through-bolts and other connectors as required. Use only Type 316 stainless steel devices and fasteners.
4. Provide end posts and railing returns at 16-inches on each side of structural expansion joints. Separation between returns shall match the width of the structural joint.
5. Filed-dowel connections shall be located at posts.

N. Alignment and Adjustment for New Construction Installation

1. Adjust railings and handrails prior to securing in place to ensure proper matching at butting joints and correct alignment throughout their length. Plumb posts in each direction.
2. Anchor posts in concrete by means of sleeves set and anchored into concrete substrate. Provide closure secured to the bottom of the sleeves. Unless otherwise shown on the Contract Drawings, after the posts have been inserted into the sleeves, fill the annular space between posts and sleeves solid with

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non-shrink, non-metallic grout as specified. Crown grout away from posts.

O. Cleaning

1. Clean exposed surfaces of aluminum pipe railing work of every substance before leaving the site after completion of installation. Comply with recommendations of both the aluminum pipe railing and finish manufacturer. Do not use abrasives or non-approved solvent cleaners. Test cleaning techniques on an un-used section of railing before employing cleaning technique in the work.
 - a. Remove protective plastic as recommended by manufacturer.
 - b. Remove all stains, dirt, grease and other substances by washing railings and handrails thoroughly using clean water and soap. Rinse with clean water.
 - c. Do not use acid cleaning solutions, steel wool or other harsh abrasives.
 - d. If stains remain after washing, remove finish and restore in accordance with recommendations of the manufacturer.
2. Leave aluminum pipe railing and handrails, free from dents, burrs, scratches, holes and other blemishes. Refinish minor scratches to be indistinguishable from adjacent un-scarred areas. If, after refinishing, damage remains visible when viewed from five feet away, or if finish of work has been altered to the point where it appears different from adjacent work, the Contractor shall replace damaged work with new undamaged material at no addition expense.

C. Performance Criteria

1. Maintain the visual design concept shown, and the technical requirements specified, including modules, profiles, alignment of components and requirements for finish.

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2. Contractor shall provide welded pipe handrail and railing system that conforms to the City of New York Building Code, ASTM E985 and CFR 29, Part 1910.23, including the 200 pound loading requirement, and including the requirement that specific types of occupancies and sizes of contributing protected areas shall incorporate greater design load resistance into welded pipe railing system, in compliance with ASTM E985, than that specified herein.
 - a. Completed handrail and railing shall withstand a uniform lateral force of 50 pounds per linear foot and a vertical uniform downward force of 50 pounds per linear foot, both applied simultaneously at the top of the handrail and railing, performance tested in accordance with Test Method A and B of ASTM E935.
 - b. Intermediate and bottom rails shall withstand simultaneously applied lateral uniform forces of 40 pounds per linear foot and a vertical load of 50 pounds per linear foot, however, lateral and vertical loads on intermediate and bottom railings need not be considered in the detailing and fabrication of posts and anchorages.
 - c. For railings having solid panels or picket balusters, the panels or picket balusters shall be detailed and fabricated to withstand a uniform lateral load of 50 pounds distributed over any round or square area of one square foot located anywhere within the infill area or a 50 pound per foot penetration cone, performance tested in accordance with Test Method C and D of ASTM E935.
 - d. Concentrated 200 pound load and uniform force conditions shall not be applied simultaneously.
 - e. Other pertinent requirements ceded to ANSI A1264.1 by governing authorities having jurisdiction at the Site.
 - f. Bending stresses shall not exceed 60 percent of the yield stress of the material. Applied loads shall not produce permanent residual deformation in the completed work when loads are removed. Load-deformation data shall be determined in accordance with ASTM E935.
 - g. Maximum allowable deflections shall be in accordance with ASTM E985.
 - h. Where computations make it possible to provide the needed

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information, testing, in compliance with ASTM E935, shall be performed for verification that welded pipe railing system and auxiliary system components comply with specified performance requirements and the requirements of governing authorities having jurisdiction.

D. Measurement and Payment

The contract price per linear foot for Aluminum Pipe Railing shall be as indicated on the Bid Schedule of Prices, BMP-7.620A. The contract price per linear feet for Aluminum Toe Board shall be as indicated on the BID SCHEDULE OF PRICES, BMP-7.602B and the contract price for each Gate shall be indicated on the BID SCHEDULE OF PRICES, BMP-7.602C. The bid price shall be a unit price of the railing toe board and gate furnished and installed and all other work incidental thereto in accordance with the plans and specifications to the satisfaction of the Engineer.

The unit price bid shall include the costs for all labor, material, equipment and incidental expenses necessary or required to complete the work in accordance with the plans and specifications to the satisfaction of the Engineer.

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7.621

TIMBER BARRIER RAIL

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CONTRACT MIBBNC0017.622 FOREBAY MICROPPOOL SEDIMENT CLEAN-OUT INDICATORA. Description of Work

Under this item, the Contractor shall furnish, install and adjust Forebay-/Micropool Sediment Clean-Out Indicator in accordance with the plans, specifications and directions of the Engineer within the BMP Project limits and associated work areas.

B. Submittals

1. Before the work is started, the Contractor shall submit shop drawings for approval by the Engineer.
2. Drawings for the fabrication and installation of stainless steel welded Forebay/Micropool Sediment Clean-Out Indicator with sizes of members, components and anchorage devices, all based on specified requirements. Include copies of standard and custom detail drawings and installation instructions. Include all plans and elevations identifying the location and top elevation to establish sediment clean-out indicator removal depth.

C. Materials

All fittings and hardware shall be of the materials listed in the following schedule:

Stainless Steel:

1. Stainless Steel Rod or Pipe: ASTM A554, Type 316L. Provide posts and plates with 1.0 inch outside diameter, Schedule 10 min.
2. Stainless Steel Fittings: Same material and thickness as posts and plates except where otherwise shown on Contract Drawings.

Non-Shrink, Non-Metallic Grout:

1. Pre-mixed non-staining cementitious grout requiring only the addition of water.
2. Product and Manufacturer: Provide one of the following:
 - a. Euco N-S by the Euclide Chemical Company.
 - b. Masterflow 713 by Master Builders Company.
 - c. CPD Non-Shrink Grout Premix by Gantrex.
 - d. Or approved equal.

D. Installation

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1. The Forebay/Micropool Sediment Clean-Out Indicators shall be set in concrete as shown on the plans or as directed by the Engineer.
2. Adjust Clean-Out Indicators prior to securing in place with concrete or grout to ensure proper and correct alignment throughout their length. Plumb in each direction and adjust to the appropriate elevation.
3. Anchor or grout into concrete substrate.
4. All Clean-Out Indicators shall be set plumb and true to line and grade. Any Indicators 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.

E. Measurement and Payment

The quantity of Forebay/Micropool Sediment Clean-Out Indicators to be paid for under this item shall be the total number furnished and installed in accordance with the plans, specifications and directions of the Engineer.

The contract price for Each - Forebay/Micropool Sediment Clean-Out Indicator shall be as indicated on the BID SCHEDULE OF PRICES, Item BMP-7.622. The bid price shall include the cost for all labor, material, equipment and incidental expenses necessary to complete the work, including submissions and approvals, materials, fabrication, installation, and adjustment to the proper elevation, all in accordance with the plans and specifications to the satisfaction of the Engineer.

* * * * *

DIVISION VII - DETAILED SPECIFICATIONS -
CONTRACT MIBBNC001

STREAMBANK STABILIZATION

7.700 WORK INCLUDED

Under Streambank Stabilization, the Contractor shall provide all labor, material, tools and equipment necessary to complete the execution of the work in complete accordance with the Specifications and all Contract Drawings. The work shall include items of work specified under the following Sections.

<u>Section Number</u>	<u>Title</u>
7.705	Erosion Control Mat
7.710	Reno Mattress

DIVISION VII - DETAILED SPECIFICATIONS -
CONTRACT MIBBNC001

7.701

LIVE STAKES

NO TEXT ON THIS PAGE

DIVISION VII - DETAILED SPECIFICATIONS –
CONTRACT MIBBNC001

7.702

ROCK TOE PLANTING

NO TEXT ON THIS PAGE

DIVISION VII - DETAILED SPECIFICATIONS -
CONTRACT MIBBNC001

7.703

NATURAL FIELD STONES

NO TEXT ON THIS PAGE

DIVISION VII - DETAILED SPECIFICATIONS -
CONTRACT MIBBNC001

7.704

OAK STAKES

NO TEXT ON THIS PAGE

DIVISION VII - DETAILED SPECIFICATIONS –
CONTRACT MIBBNC001

7.705 EROSION CONTROL MATA. Description of Work

The Contractor shall furnish all labor, materials, and equipment necessary for placement of erosion control Mat as indicated on the Contract Drawings and as specified herein.

The erosion control mat shall be used for stabilization as indicated in the Contract Drawings.

The erosion control mats are 100% cleaned and wheel spun coconut fiber strands, uniformly twisted and woven into a flexible matrix. Coconut fiber is 100% mattress grade, 45% Lignin with a low elongation factor and high fabric tearing strength. The erosion control mats biodegrade in approximately five to ten years. The erosion control mat shall be Coirmat 700 by Rolanka Corporation; Control Mat 70 by Granite Environmental; GEOCOIR/DeKoWe 700 by Geo-Synthetics, LLC; or approved equal.

B. Material

100% high strength coir (coconut) fiber.

C. Staples

Minimum 11 gauge, 8" x 1" driven in a pattern of three per square yard and at intervals of 1' - 0" along sides and overlapping sections.

D. Installation

The erosion control blanket shall be installed as indicated on the Contract Drawings.

E. Measurement and Payment

The quantity to be measured for payment under this Section shall be the number of square feet of surface area on which erosion control mats has been installed in accordance with the Contract Drawings, Specifications and directions of the Engineer.

The contract price per square foot of erosion control mats shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.705. The bid price shall include the costs for all labor, materials, equipment and incidental expenses necessary to complete the work in accordance with the Plans and Specifications and to the satisfaction of the Engineer.

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DIVISION VII - DETAILED SPECIFICATIONS -
CONTRACT MIBBNC001

7.706

FILTER BEDDING

NO TEXT ON THIS PAGE

DIVISION VII - DETAILED SPECIFICATIONS -
CONTRACT MIBBNC001

7.707

COIR LOGS

NO TEXT ON THIS PAGE

DIVISION VII - DETAILED SPECIFICATIONS -
CONTRACT MIBBNC001

7.708

ROOT WAD/BRANCH CLUSTER AND DOWNED TREE PROVISION
AND PLACEMENT

NO TEXT ON THIS PAGE

DIVISION VII - DETAILED SPECIFICATIONS -
CONTRACT MIBBNC001

7.709

STRAIGHT VANE

NO TEXT ON THIS PAGE

DIVISION VII - DETAILED SPECIFICATIONS -
CONTRACT MIBBNC001

7.710 RENO MATTRESSA. Description of Work

Under this item the Contractor shall furnish all labor, materials, equipment necessary to install Reno Mattress as shown on the Contract drawings and in accordance with the specification and as directed by the Engineer.

B. Materials and Construction

Reno Mattress is a wire mesh container uniformly partitioned into internal cells with relatively small height in relation to the other dimensions. The internal cells are interconnected with other units and filled with stone at the project site to form flexible, permanent monolithic structures used for channel bottom protection. The reno mattress shall have the dimensions as shown on the contract drawings.

The wire mesh shall be non-raveling mesh made of twisting continuous pairs of wires to form hexagonal shaped openings which are interconnected to adjacent wires. The wire is made from zinc coated and overcoated with PVC. PVC coatings shall not show cracks or breaks after the fabrication of the mesh. Fasteners used to assemble and interconnect the individual units shall be made of stainless steel.

The stones for the reno mattress shall be between 4" and 6" in diameter. The stones shall meet the specifications of the Rip Rap, Section 7.107 of this contract.

The subgrade shall be excavated to allow for the placement of the reno mattress to form the grade shown of the contract drawings. The reno mattress shall be placed on geotextile fabric laid directly on the compacted subgrade.

C. Measurement and Payment

The quantity to be measured for payment under this Section shall be the total number of square yards of reno mattress installed as directed by the Engineer. The contract price per square yard of reno mattress installed shall be as indicated on the BID SCHEDULE OF PRICES Item No. BMP-7.710. The contract price shall include all excavation, grading and geotextile fabric necessary to install the reno mattress as directed by the Engineer. The bid price shall constitute full compensation for all labor, materials, equipment and work incidental thereto, necessary to complete this item in accordance with the plans and specifications to the satisfaction of the Engineer.

* * * * *

End of addendum No.5
This addendum consists of three-hundred twenty-seven (327) pages.





ATTACH TO CONTRACT DOCUMENTS

**THE CITY OF NEW YORK
DEPARTMENT OF DESIGN AND CONSTRUCTION
INFRASTRUCTURE DIVISION
BUREAU OF DESIGN**

PROJECT ID: MIBBNC001

FOR THE CONSTRUCTION OF STORM SEWERS AND APPURTENANCES IN:

KISWICK STREET BETWEEN HUNTER AVENUE AND BMP NC-7; NUGENT AVENUE BETWEEN HUNTER AVENUE AND BMP NC-7; JEFFERSON AVENUE BETWEEN NUGENT AVENUE AND BMP NC-7; GRIMSBY STREET BETWEEN A POINT APPROXIMATELY 150-FEET EAST OF GRAHAM BOULEVARD AND BMP NC-7; HUNTER AVENUE BETWEEN KISWICK STREET AND NUGENT AVENUE; FREEBORN STREET BETWEEN BMP NC-7 AND BMP NC-8; FREEBORN STREET BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; OLYMPIA BOULEVARD BETWEEN BMP NC-8 AND BMP NC-9; OLYMPIA BOULEVARD BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; GRAHAM BOULEVARD BETWEEN BMP NC-9 AND BMP NC-17; AND, GRAHAM BOULEVARD BETWEEN PATTERSON AVENUE AND BADEN PLACE

INCLUDING WATER MAIN WORK

Together With All Work Incidental Thereto

BOROUGH OF STATEN ISLAND

ADDENDUM NO. 6

DATED: June 23, 2014

This Addendum is issued for the purpose of amending the requirements of the Contract Documents and is hereby made part of said Contract Documents to the same extent as if it was originally included therein.

- (1) Refer to the Bid and Contract Documents, Volume 1 of 3, BID SCHEDULE, page B-10, Item No. 51.21A010000C, Sequence No. 38;
Delete Item No. 51.21A010000C in its entirety;
Substitute the text "NO BID ITEM".

Refer to the Bid and Contract Documents, Volume 1 of 3, BID SCHEDULE, page B-10, Item No. 51.21A011000C, Sequence No. 39;
Delete Item No. 51.21A011000C in its entirety;
Substitute the text "NO BID ITEM".

Refer to the Bid and Contract Documents, Volume 1 of 3, BID SCHEDULE, page B-24, Item No. BMP-7.103-A, Sequence No. 121;
Delete "1,350.00" under Column 3, Engineer's Estimate Of Quantity;
Substitute "1,050.00".

- (2) Refer to the Bid and Contract Documents, Volume 3 of 3, Addendum No. 2, NOTICE TO BIDDERS, page A2-3;
Add paragraph (13)



(13) Access Manhole No.1 is located adjacent to the Access Manhole No.2 on the proposed 9'-0"W x 4'-0" H Double Barrel F.T.R.C Storm Sewer at the intersection of Nugent Avenue and Hunter Avenue. (Sheet 4 of 19 of the Contract Drawing).

By signing in the space provided below, the bidder acknowledges receipt of two (2) pages of this Addendum.

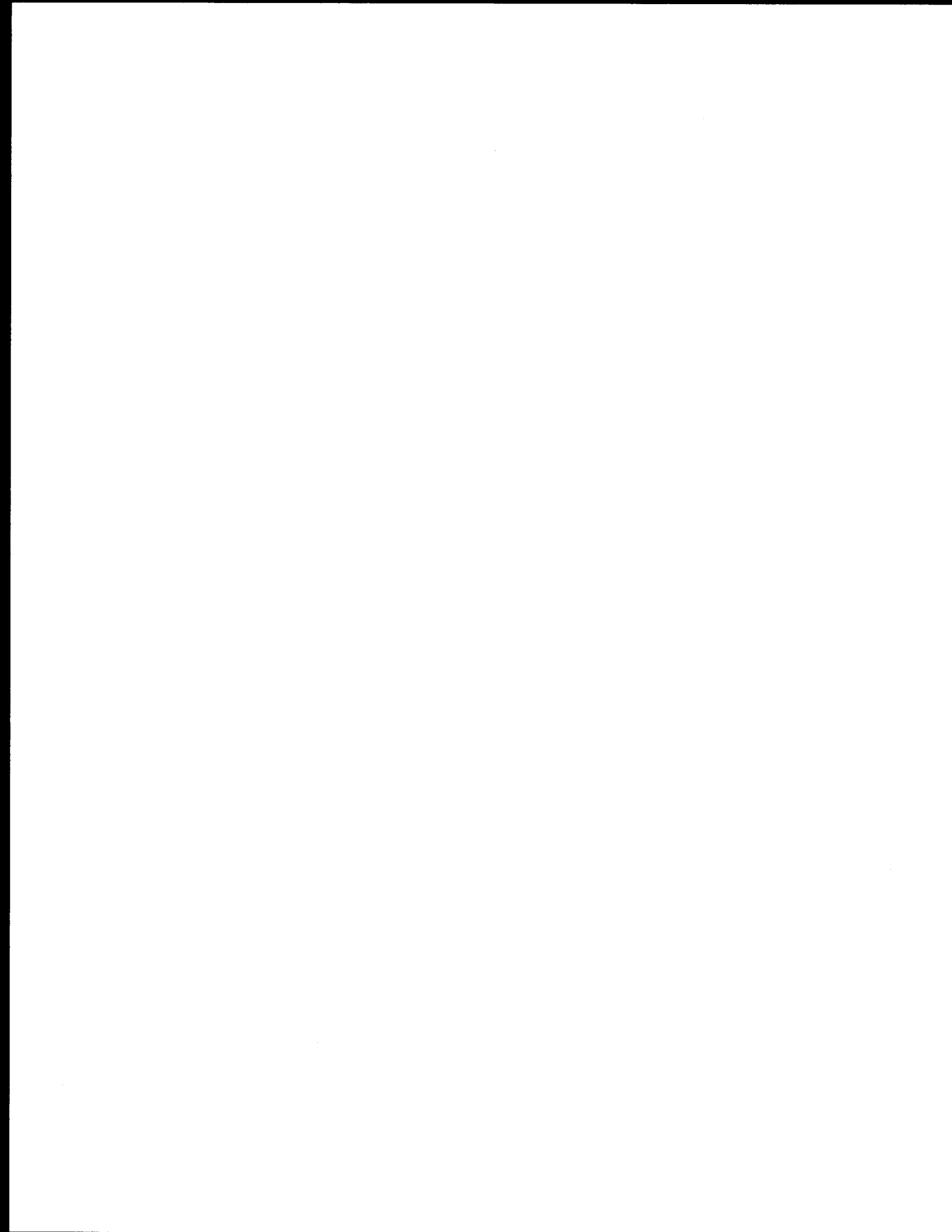
THIS ADDENDUM MUST BE SIGNED BY ALL BIDDERS AND ATTACHED TO THEIR BIDS.

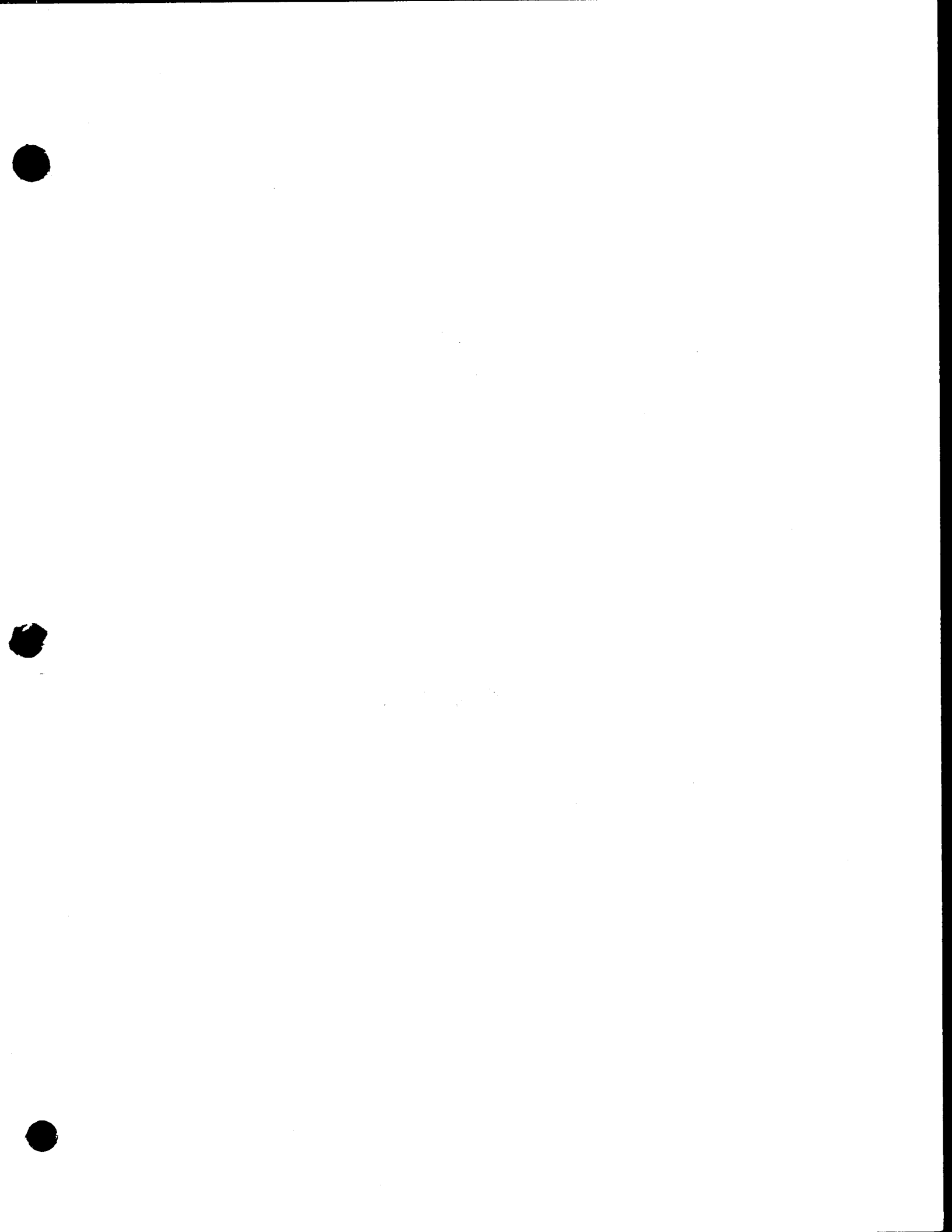
Name of Bidder

By: _____

for Purnima Sharda
GURDIP SAINI, P.E.
Assistant Commissioner/Design

D 6/23/14







**INFRASTRUCTURE DIVISION
BUREAU OF DESIGN**

VOLUME 3 OF 3

PROJECT ID: MIBBNC001

FOR THE CONSTRUCTION OF STORM SEWERS AND APPURTENANCES IN:

KISWICK STREET BETWEEN HUNTER AVENUE AND BMP NC-7; NUGENT AVENUE BETWEEN HUNTER AVENUE AND BMP NC-7; JEFFERSON AVENUE BETWEEN NUGENT AVENUE AND BMP NC-7; GRIMSBY STREET BETWEEN A POINT APPROXIMATELY 150- FEET EAST OF GRAHAM BOULEVARD AND BMP NC-7; HUNTER AVENUE BETWEEN KISWICK STREET AND NUGENT AVENUE; FREEBORN STREET BETWEEN BMP NC-7 AND BMP NC-8; FREEBORN STREET BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; OLYMPIA BOULEVARD BETWEEN BMP NC-8 AND BMP NC-9; OLYMPIA BOULEVARD BETWEEN HUNTER AVENUE AND GRAHAM BOULEVARD; GRAHAM BOULEVARD BETWEEN BMP NC-9 AND BMP NC-17; AND, GRAHAM BOULEVARD BETWEEN PATTERSON AVENUE AND BADEN PLACE

INCLUDING WATER MAIN WORK

Together With All Work Incidental Thereto
BOROUGH OF STATEN ISLAND
CITY OF NEW YORK

JR Cruz Corp.

Contractor

Dated _____, 20____