



George Latimer, Westchester County Executive

**General Requirements and Proposals
Information for Bidders
General and Special Clauses
Technical Specifications**

**DOMESTIC WATER SYSTEM IMPROVEMENTS
WESTCHESTER COUNTY AIRPORT
TOWNS OF HARRISON AND NORTH CASTLE AND
VILLAGE OF RYE BROOK, NEW YORK**

**Contract No. 22-522
Bid Opening: January 11, 2023**

By Bidder (Please Print)	For Official Use Only
Firm/Business Name: _____ Address: _____ _____	_____ _____

**DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering**

SPECIAL NOTICE

County of Westchester
New York

ADDENDA TO THE BID DOCUMENTS

Addenda to the Bid Documents will be published on the Empire State Purchasing Group website at (<http://www.bidnetdirect.com/new-york>) **It is the responsibility of each potential bidder to check the website on a regular basis for further information relative to the bid documents including information relating to any and all addenda** prior to submitting its bid. All Bidders are deemed to have reviewed and considered all addendums in their Bid.

SUBMISSION OF BIDS

Bidders should not submit the entire bid document with its bid submission. Instead, each bidder is required to submit the full set of designated Proposal Pages. The Proposal Pages are denoted by a border and are titled on the bottom as “Proposal Page ___”. The Proposal Pages must be accompanied by the “Bid Bond and Consent of Surety” (as set forth in the Proposal Pages) attached to the outside of the sealed bid. A Bid Bond is NOT required for contracts of \$100,000 or less. Failure to submit in this manner may cause the bid to be rejected.

The successful bidder will be required to furnish a Performance and Payment Bond.

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New York

QUESTIONS DURING BIDDING

No interpretation of the meaning of the plans, specifications or other contract documents will be made to any bidder orally. Every request for such interpretation shall be in writing addressed to the Westchester County Project Manager. The inquiries shall be sent to:

Jeff Dean
Westchester County Department of Public Works and Transportation,
148 Martine Avenue, Suite 500
White Plains, New York 10601
jadc@westchestergov.com

To be given consideration, questions must be received by the close of business on **December 27, 2022 at 5:00 PM.** Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications.

Addenda to the Bid Documents will be published on the on the Empire State Purchasing Group website at (<http://www.bidnetdirect.com/new-york>) **It is the responsibility of each potential bidder to check the website on a regular basis for further information relative to the bid documents including information relating to any and all addenda** prior to submitting its bid. All Bidders are deemed to have reviewed and considered all addendums in their Bid. Failure of any bidder to receive any such addendum or interpretation or any other form, instrument or document shall not relieve any bidder from any obligation under its bid as submitted. All addenda so issued shall become part of the contract documents.

A bidder's failure to request a clarification, interpretation, etc. of any portion of the plans, specifications, or contract or to point out any inconsistency therein will preclude such bidder from thereafter claiming any ambiguity, inconsistency, or error which should have been discovered by a reasonably prudent bidder and from asserting any claim for damages arising directly or indirectly therefrom.

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County of Westchester
New York

MANDATORY PRE-BID SITE INSPECTION

- A. Superseding the first paragraph of Article “3. PRE-BID SITE INSPECTION” of the Information for Bidders, Bidders are required to attend a Mandatory Pre-Bid Site Inspection at 10:00 a.m. Monday, December 19, 2022 at a meeting at the 2nd Floor Operations Office at the Terminal Building, Westchester County Airport, New York, at which time they will examine the work site under escort by the County’s representative.

BIDS FROM CONTRACTORS NOT IN ATTENDANCE AT THIS MEETING, OR THOSE WHO FAIL TO SIGN THE ATTENDANCE SHEET-WILL BE *REJECTED*

- B. Bidders shall indicate their interest in the Mandatory Pre-Bid Site Inspection by contacting Jeffrey Dean, P.E., Department of Public Works and Transportation, Division of Engineering at (914) 995-3361.
- C. All other portions of Article “3. PRE-BID SITE INSPECTION” of the Information for Bidders shall remain in full force and effect.

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County of Westchester
New York

MINORITY PARTICIPATION POLICY

Contractors must comply with the County's Minority Participation Policy, including, but not limited to, the requirement that contractors make a demonstrated good faith effort to utilize Minority Owned Businesses ("MOB") and Women Owned Businesses ("WOB") (see IFB Article 36). To assist contractors in this effort the County has made available a list of MOB and WOB at <http://mwbe.westchestergov.com/> Contractors are also encouraged to utilize other sources to identify potential MOB and WOB as subcontractors and suppliers.

All bidders must submit as part of their bid package the Minority/Women Owned Business Enterprise Questionnaire located in the Proposal Page section of the bid documents.

SPECIAL NOTICE

County of Westchester
New York

CHANGES IN THE WICKS LAW

Effective July 1, 2008, construction contracts of one million five hundred thousand dollars or less will not require the preparation of separate contracts for plumbing and gas fitting; steam heating, hot water heating, ventilation and air conditioning apparatus; and electric wiring and standard illuminating fixtures and general construction.

Each bidder on a public work contract, where the preparation of separate contracts is not required shall, to the full extent applicable, submit with its bid a separate sealed list that names each Subcontractor that the bidder will use to perform work on the contract and the agreed upon price to be paid to each for (a) plumbing and gas fitting, (b) steam heating, hot water heating, ventilating and air conditioning apparatus and (c) electric wiring and standard illuminating fixtures and (d) general construction. The submission (Proposal Page 6) that contains the agreed upon price shall be acknowledged by both Contractor and Subcontractor. For purposes of this paragraph, the acknowledgment from the Subcontractor may contain the facsimile signature of an officer of the Subcontractor.

After the low bid is announced, the sealed list of subcontractors submitted with the bid shall be opened and the names of such subcontractors shall be announced. Thereafter, any changes of subcontractors or agreed-upon amount to be paid to each shall require the approval of the County upon a showing of legitimate construction need for such change.

The Successful low bidder, before award of the contract, must procure and provide to the County, from each of the above denoted Subcontractors, a Contract Disclosure Statement and the Required Disclosure of Relationships to County forms.

The sealed lists of Subcontractors submitted by unsuccessful bidders shall be destroyed after the contract award.

THIS PROJECT IS NOT SUBJECT TO THE REQUIREMENTS OF THE “WICKS LAW”. ACCORDINGLY, EACH BIDDER IS REQUIRED TO SUBMIT SPECIFIC INFORMATION PERTAINING TO ITS PROPOSED SUBCONTRACTORS. PLEASE SEE THE “NOTICE TO CONTRACTORS” THAT FORMS A PART OF THESE BID DOCUMENTS.

SPECIAL NOTICE

County of Westchester
New York

PREVAILING WAGE

All public works contracts are subject to the payment of the prevailing wage and supplements as set forth by the laws of the State of New York, including, but not limited to, Articles 8 and 9 of the New York Labor Law (the “Prevailing Wage Laws”). Westchester County has an active Prevailing Wage Enforcement Officer who enforces the Prevailing Wage Laws within the County for public works contracts, including reviewing certified payroll records, visiting job sites, interviewing the employer and employees (See IFB Article 12) and, if necessary, requesting copies of cancelled checks.

Any Contractor who fails to comply with the Prevailing Wage Laws, including, but not limited to, failing to pay the prevailing wage rates and supplements, failing to submit certified payroll records to the County or failing to post the prevailing wage rates and supplements at the work site, will be subject to enforcement as provided for in the Contract and laws of the State of New York through the Westchester County District Attorney’s office, the Commissioner of the New York State Department of Labor, the County and/or the employee who suffered the underpayment. This enforcement could include, but is not limited to, criminal penalties, civil penalties, debarment from future bid awards, the withholding of payment under the Contract to satisfy the unpaid wages and supplements, including interest and civil penalty. In addition, such a failure shall constitute grounds for cancellation of the Contract (IFB 8(C)). Moreover, a prime contractor is responsible for its subcontractor’s failure to comply with, or evasion of, the provisions of the Prevailing Wage Laws.

SPECIAL NOTICE

County of Westchester
New York

PROJECT LABOR AGREEMENT (PLA)

- A. The County of Westchester has determined that a Project Labor Agreement will be used on this Project. The successful bidder will be required as a condition of this Contract to execute the PLA with the Building and Construction Trades Council of Westchester and Putnam Counties, New York, AFL-CIO ("Council"). The PLA will be substantially in the same form as the PLA included in this contract specification book. Bidders are urged to familiarize themselves with the terms and conditions of the PLA.
- B. It should be noted that Schedule A of the PLA contains a list of the local unions affiliated with the Council. Copies of the applicable Collective Bargaining Agreements of the local unions can be obtained by writing to the Building and Construction Trades Council of Westchester and Putnam Counties, New York, AFL-CIO at 258 Saw Mill River Road, Elmsford, New York 10523, Attn.: Carol A. Boccardi.

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County of Westchester
New York

COMPLETION OF GRANT FUNDING FORMS

The bidders are hereby notified that if this project, or any portion thereof, is funded by a grant then the contractor will be responsible to complete all appropriate forms as required by the grant agency in order to complete the application.

PROMPT EXECUTION AND RETURN OF CONTRACT

- A. The successful bidder is required to return the completed contract to the County within ten (10) days of receipt of the execution copy of the contract. The contract must be signed, notarized and returned to the County with all insurance certificates, bonds and supporting documentation, including all required Subcontractor information.
- B. The County reserves all of its rights, including, but not limited to, proceeding against the bid bond, if the successful bidder fails to submit the complete executed package within the above time frame.

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County of Westchester
New York

Airport Environmental Management System Requirements

General

The Contractor is responsible for complying with all federal, state and local legal environmental requirements.

Training

A two-hour environmental training session by the Airport Environmental Staff is required for the project superintendent, project manager and responsible foreman for contractors and subcontractors.

The Contractor shall designate a staff member who will be responsible for the oversight of environmental project requirements and to work as a liaison with the Airport Environmental Department.

Erosion and Sediment Control Activities

The Contractor shall comply strictly with Erosion and Sediment Control project specifications and regulatory requirements. Erosion and Sediment Controls may include, but not limited to, the following:

- Proper installation and use of erosion and sediment capture devices i.e. silt fences and hay bales
- Protection of storm drain inlets
- Proper and timely backfilling and stabilization of trench excavation
- Inspections of discharge points
- Proper maintenance of erosion and sediment capture devices

The Contractor shall be subject to Erosion and Sediment Control Inspections by the County and/or Airport Environmental Staff.

Airfield Vehicles and Equipment

The contractor shall ensure that all vehicles and equipment going onto the airfield are cooled with propylene glycol

SPECIAL NOTICE

County of Westchester
New York

Waste Management and Minimization

The Contractor shall dispose of waste in a manner that meets all applicable laws and regulations. Contractors shall make every effort to minimize waste production during construction operations.

Spills Prevention, Control and Response Procedures

The Contractors supervisory personnel will be trained in Airport Spill Prevention, Control and Response Procedures Requirements during the two-hour environmental training session. These supervisory personnel shall ensure that these requirements are complied with and that their on-site personnel are properly trained in spill prevention, control and response procedures that comply with Airport requirements. Contractor shall have a copy of these procedures available on site. The Contractor shall have appropriate spill clean-up equipment on site at all times.

In the event of a spill, the Contractor shall immediately respond to the spill in conformance with their spill procedures and as soon as possible report the spill to Airport Operations by radio or by telephone at 995-4850.

The Contractor is responsible for proper clean-up and disposal of waste materials generated by any spill resulting from their activities.

Good Housekeeping

The Contractor shall demonstrate good housekeeping practices and perform daily site clean-ups. The Contractor shall be subject to inspections by the County and/or Airport Environmental Staff.

Wetland Areas & Groundwater Monitoring Wells

The Contractor shall plan all work to avoid any disturbance, impact or destruction of wetland areas and groundwater monitoring wells. If an incident occurs, the Contractor shall be responsible for any costs associated with the restoration of wetland areas, and repair or replacement of groundwater monitoring wells.

Change to Environmental Project Design Specification

The Contractor shall receive approval from an authorized County representative prior to making any modifications that effect environmental project specifications due to field conditions.

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County of Westchester
New York

CONTRACTOR SECURITY ID ISSUE

Qualifications

HPN IDs are required for all personnel performing contract work in the Secured Areas of the Airport or within the AOA (Air Operations Area).

Contractors performing work in the **SIDA Area** (Security Identification Display Area) of the terminal complex or airline ramp are required to go through the following process before gaining access to the SIDA:

- ID issue request
- Point of Contact (POC) information
- Complete a SIDA access application
- 2 Hour SIDA Course
- Establish proof of Identification
- Criminal History Record Check (Fingerprint processing)
- ID Security Deposit

Contractors performing work in the **Non-SIDA Areas** of the AOA are required to go through the following process before gaining access to the AOA:

- ID issue request
- POC information
- Complete a Non-SIDA access application
- Establish proof of Identification
- Verified 10 Year Employment History Background Check
- ID Security Deposit

Access to the SIDA or Non-SIDA areas can be also granted through the issuance of a HPN SIDA or Non-SIDA **Visitors ID**. All Visitor ID holders are required to surrender a specified form of ID for deposit at Airport Operations. Visitor ID holders require a HPN ID holder to sign out each recipient and continuously escort the Visitor while in the designated area. A maximum of 8 people can be escorted by an ID card holder at any time.

Submittals

Companies must submit an **ID Issue Request** in writing to the Airport Security office for either SIDA or Non-SIDA IDs. Included must be the reason for needing access, the location of work,

SPECIAL NOTICE

County of Westchester
New York

the duration of all phases of work, the names of all ID applicants, their purposes or job titles, and types of vehicles that require access to certain phases of work.

Companies must submit a point of contact (**POC**) as the responsible party for ID accountability. This person must be an ID holder and have daily interaction with planning and construction crews. The POC information must include:

- POC Name
- POC Address
- POC Telephone number
- Company telephone number

Companies requesting Non-SIDA access media must perform a full **10 Employment History Check** on each applicant. Contact of each agency must be verified, and there may be no gaps within the 10-year period.

Accountability

The company is accountable for all IDs issued, and must return all IDs within 1 week of completion of the specified work to Airport Security Personnel.

Lost or missing IDs are to be reported to Airport Operations immediately, and a lost ID processing fee of \$100 will be charged before a new ID is reissued. If an individual loses an ID for the second time, a third ID will not be issued, the security deposit will not be refunded, and access to the airfield will be denied.

Airport IDs must be surrendered to Airport Operations personnel upon request.

Security Deposit

A security deposit of \$100 (Cash or Check) will be held for each SIDA or Non-SIDA ID issued. Deposits will be returned within 2 weeks of ID return

IDs not returned upon completion of the contract will be considered lost, and a Lost ID processing fee of \$100 will be charged to the company in addition to losing the Security Deposit.

Issue

IDs will be issued within 1 week of receiving all required information, including FBI Fingerprint results posted by the TSA. Waiting periods between when printed, and when results are received may vary.

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County of Westchester
New York

CHEMICAL LEAK RESTRICTIONS AT AIRPORT

- A. It is now the County of Westchester – Department of Transportation’s policy to ban the use of ethylene glycol for deicing aircraft and its use in construction equipment/vehicles (i.e. anti-freeze) at the Airport. This is in addition to the prior prohibition of other chemicals (i.e. gasoline, diesel fuel, lubricants, etc.) that can potentially leak/spill and contaminate the environment.
- B. Passenger automobiles are excluded from this policy.
- C. Failure to comply with this policy will cause the negligent contractor to be liable for all expenses incurred by damages or delay of work or impediment of Airport operations.

SPECIAL NOTICE

County of Westchester
New York

REQUIRED TRAINING FOR CONTRACTOR PERSONEL

A four hour training session by the airport manager will follow the preconstruction meeting and be required for all flaggers, project superintendent, project manager, and responsible foremen for contractor and subcontractors. All contractor's and subcontractor's personnel shall be trained regarding the importance of following the special procedures outlined in the special notes, inspection of the work for compliance with the special procedures, and safe disposal of trash. Flaggers shall be trained in the proper use of ground control radios and terminology.

An eight hour training session by the airport manager is required for all potential escort vehicle drivers. Scheduling of this training shall be arranged by the Contractor through the airport manager.

The Contract shall supply all escort vehicles with qualified drivers. Escort vehicles shall be pickup trucks or passenger vehicles in good working order. Vehicles shall be equipped with dashboard mounted radios, construction warning flags and rotary beacons. The airport manager reserves the right to reject any drivers and/or vehicles for failure to comply with these provisions.

All training for flaggers and drivers is to be completed prior to start of construction.

NOTICE TO CONTRACTORS

County of Westchester
New York

Sealed proposals for the following construction work:

CONTRACT NO: 22-522

ADVERTISING: December 9, 2022

MANDATORY PRE-BID INSPECTION: December 19, 2022

DOMESTIC WATER SYSTEM IMPROVEMENTS WESTCHESTER COUNTY AIRPORT TOWNS OF HARRISON AND NORTH CASTLE AND VILLAGE OF RYE BROOK, NEW YORK

will be received by the Board of Acquisition and Contract in Room 528, Michaelian Office Building, 148 Martine Ave., White Plains, New York until 11:00 a.m., **Wednesday, January 11, 2023**, and immediately thereafter, the bids will be publicly opened and read aloud in Room 527 of the said building. The bid opening also will be made accessible to the public via the livestreaming service WebEx. The livestreaming of the bid opening via WebEx is in addition to and not in place of the publicly bid opening to be held in Room 527 of the Michaelian Office Building. For additional bidding information or questions call (914) 995-2274.

Instructions for livestreaming via WebEx. Attendees may join by computer browser at <https://westchestergov.webex.com/meet/bac-bidopening> or by phone 1-415-655-0001 US Toll or 1-844-621-3956 US Toll Free. The Access Code is 614 981 028.

The Bid Documents (General Requirements, Information for Bidders, Technical Specifications, etc. with Authorized Proposal Pages) **MUST BE OBTAINED from the Empire State Purchasing Group website at the following web address:**

<http://www.bidnetdirect.com/new-york>.

There is no cost to the bidder for this service. Bid documents will be available after 1:00 p.m. on the advertising date.

PLEASE TAKE NOTICE: IN ORDER TO SUBMIT A BID, BIDDERS MUST REGISTER AND DOWNLOAD THE BID DOCUMENTS FROM THE EMPIRE STATE PURCHASING GROUP WEBSITE AND MUST REGISTER USING THE NAME OF THE PERSON OR BUSINESS ENTITY THAT WILL BE SUBMITTING THE BID. IN ORDER TO ENSURE THAT COUNTY BID DOCUMENTS HAVE NOT BEEN ALTERED IN ANY WAY, THE COUNTY WILL NOT ACCEPT BIDS FROM PERSONS OR BUSINESS ENTITIES THAT HAVE NOT FOLLOWED THIS REQUIREMENT.

The Bid Documents include Contract Drawings which **MAY BE OBTAINED at no cost on the Empire State Purchasing Group website at the following web address:** <http://www.bidnetdirect.com/new-york>, after 1:00 p.m. on the advertising date.

If the bidder is unable to utilize the electronic version of the Contract Drawings that are available on the Empire State Purchasing Group Website, the bidder may purchase copies of the Contract Drawings. Contract Drawings may be obtained from the Office of the Board of Acquisition and Contract at the above address after 1:00 p.m. on the advertising date and between the hours of 9:00 a.m. to 4:00 p.m. Monday thru Friday. Copies of the Contract Drawings shall be made available upon payment of a personal check, company check or money order made payable to the County of Westchester, in the amount of **\$100.00** per set. For bidders, the deposit for each set of drawings will be refunded in full if returned in good condition within thirty days after award or rejection of bids. For non-bidders, only fifty percent of the deposit will be refunded. No refunds will be made to the successful bidder.

Each bidder is required to submit the full set of authorized Proposal Pages and all bids over **\$100,000.00** must also be accompanied by the "Bid Bond and Consent of Surety" (as set forth in the Proposal Pages) attached to the outside of the sealed bid. Failure to submit in this manner may cause the bid to be rejected. **The successful bidder, no matter the amount of its bid, will be required to furnish a Performance and Payment Bond with its signed contract.**

To the full extent applicable, each bidder shall submit with its bid a separate sealed list that names each Subcontractor that the bidder will use to perform work on the contract and the agreed upon price to be paid to each for: (a) plumbing and gas fitting, (b) steam heating, hot water heating, ventilating and air conditioning apparatus and (c) electric wiring and standard illuminating fixtures and (d) general construction. The submission (Proposal Page 41) that contains the agreed upon price shall be acknowledged by both Contractor and Subcontractor. For purposes of this paragraph, the acknowledgment from the Subcontractor may contain the facsimile signature of an officer of the Subcontractor.

The Successful low bidder, before award of the contract, must obtain and provide to the County, from each of the above denoted Subcontractors, fully completed and signed Contract Disclosure Statement (Proposal Pages 24-32) and Required Disclosure of Relationships to County (Proposal Pages 33) forms.

The sealed lists of Subcontractors submitted by unsuccessful bidders shall be destroyed, unless you request that it be returned by checking the applicable box on Proposal Page 5.

The County of Westchester reserves the right to waive any informalities in the bids, or to reject any or all bids. No bidder may withdraw its bid within forty-five (45) days after the date of the bid opening.

Pursuant to Chapter 308 of the Laws of the County of Westchester, it is the goal of the County to use its best efforts to encourage, promote, and increase the participation of business enterprises owned and controlled by persons of color or women - Minority Business Enterprise (MBE) and Women Business Enterprise (WBE).

REMINDER: All required licenses should be submitted with the Bid.

COUNTY OF WESTCHESTER, NEW YORK
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

BY: Hugh J. Greechan, Jr., P.E., Commissioner

TABLE OF CONTENTS

SECTION 1: GENERAL REQUIREMENTS AND PROPOSALS

General Requirements

1.	Description of the Work.....	1.1
2.	Subcontracting & Direct Employment of Labor.....	1.2
3.	Required Time for Completion of the Work.....	1.2
4.	Security Regulations	1.3
5.	Payment for Bonds and Insurance	1.5

Contract Drawings

Contract Drawings	Contract Drawings 1
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Proposal Forms

Bidder's Identification.....	Proposal Page 1
Proposal Requirements and Addendum Receipt.....	Proposal Page 2
Non-Collusive Bidding Certification.....	Proposal Page 4
Bid Page(s).....	Proposal Page 6
Contractor's Acknowledgement.....	Proposal Page 7
Contractor's Acknowledgement (Corporation/Sole Officer).....	Proposal Page 8
Limited Liability Company Acknowledgement	Proposal Page 9
Certificate of Authority.....	Proposal Page 10
Certificate of Authority-Limited Liability Company	Proposal Page 11
Bid Bond and Consent of Surety	Proposal Page 12
Affirmative Action Program Requirement (Contractors).....	Proposal Page 13
Apprenticeship Training Program Requirement.....	Proposal Page 14
Certificate of License (Electrical).....	Proposal Page 15
Certificate of License (Plumbing).....	Proposal Page 17
Certificate of License (Hauler)	Proposal Page 19
Stormwater Pollution Prevention Certification.....	Proposal Page 20
Prevailing Wage Rates and Supplement	Proposal Page 21
MBE/WBE Program Questionnaire	Proposal Page 22
Contractor Disclosure Statement	Proposal Page 23
Required Disclosure of Relationships to County	Proposal Page 32
Service-Disabled Veterans-Owned Business Questionnaire	Proposal Page 34
Schedule "F" Criminal Background Disclosure	Proposal Page 35
Subcontractors Sealed Bid Submission.....	Proposal Page 41

TABLE OF CONTENTS

SECTION 2: INFORMATION FOR BIDDERS

1.	Addenda And Interpretation	2.1
2.	Voided Clauses	2.1
3.	Pre-Bid Site Inspection	2.1
4.	Bid Security	2.1
5.	Performance And Payment Bond.....	2.2
6.	Indemnification Agreement	2.3
7.	Insurance Requirements.....	2.3
8.	Prevailing Wage Rates And Supplements	2.6
9.	Labor And Compliance With Labor Law	2.9
10.	Contractor's Report Of Employment And Weekly Affidavit	2.13
11.	Laws/Regulations And Appropriations.....	2.13
12.	Refusal To Answer Questions	2.13
13.	Bid Requirements.....	2.14
14.	Miscellaneous Additional Work (Item W-800)	2.14
15.	Correction Of Errors	2.15
16.	Shown Quantities	2.15
17.	Qualification Of Bidders.....	2.15
18.	Required Experience.....	2.16
19.	Increase Or Decrease Of Quantities: Elimination Of Items.....	2.16
20.	Breakdown Cost Of Lump Sum Items And Contracts.....	2.16
21.	Engineering Charges.....	2.17
22.	Estimates And Payments.....	2.17
23.	Payments To Subcontractors And Materialmen By Contractor	2.21
24.	Time Of Starting	2.22
25.	Safety And Health Regulations For Construction And Demolition Work	2.22
26.	Accident Prevention And First Aid Facilities	2.23
27.	Fire Prevention And Control.....	2.23
28.	State And Local Sales Tax Exemption	2.24
29.	Apprentices	2.24
30.	Affirmative Action Provision	2.24
31.	Affirmative Action Program Requirement	2.24
32.	Authority To Do Business In New York	2.25
33.	License Requirements (Electrical).....	2.25
34.	License Requirements (Plumbing).....	2.26
35.	License Requirements (Haulers).....	2.27
36.	Minority Participation Policy.....	2.30
37.	Sexual Harassment Policy.....	2.32
38.	Smoke-Free Workplace Policy	2.33
39.	County Energy Efficient Purchasing Policy	2.33
40.	Restriction On Use Of Tropical Hardwoods.....	2.33
41.	Disclosure Of Relationships To County	2.34
42.	Contractor Disclosure Statement	2.34
43.	Criminal Background Information.....	2.34
44.	Mandatory OSHA Construction Safety And Health Training.....	2.36

TABLE OF CONTENTS

SECTION 3: GENERAL CLAUSES

1.	Material And Workmanship	3.1
2.	Definitions.....	3.1
3.	Boundaries Of Work.....	3.2
4.	Overlapping Work	3.2
5.	Proper Method Of Work And Proper Materials	3.4
6.	Control Of Area	3.5
7.	Permits, Fees, Etc.....	3.5
8.	Traffic	3.5
9.	Inspection.....	3.5
10.	Stopping Work.....	3.5
11.	Dimensions	3.6
12.	Payments To County.....	3.6
13.	Protection Of Utilities And Structures.....	3.6
14.	Protection Of Water Resources & The Environment	3.6
15.	Sanitary Regulations	3.8
16.	Cleaning Up	3.8
17.	Prevention Of Dust Hazard.....	3.8
18.	Representative Always Present.....	3.9
19.	Work In Bad Weather	3.9
20.	Protection Of Work Until Completion.....	3.9
21.	Removal Of Temporary Structures And Cleaning Up.....	3.9
22.	Gross Loads Hauled On Highway	3.9
23.	Concrete Batch Proportions - Yield.....	3.9
24.	Damage Due To Contractor's Operations	3.10
25.	Property Damage	3.10
26.	Claims For Damages.....	3.10
27.	Extensions Of Time	3.11
28.	Request For Approval Of Equal	3.12
29.	Substitution	3.15
30.	Extra Work: Increased Compensation/Decreased Work: Credit To The Owner.....	3.18
31.	Disputed Work - Notice Of Claims For Damages	3.20
32.	Contractor's Subcontracts And Material Lists	3.21
33.	Assignment Of Contract	3.22
34.	Payment For General Provisions	3.22
35.	Costs Incurred By County.....	3.22
36.	Guarantee Of Work.....	3.23
37.	Separate Contracts	3.23
38.	Cooperation With Owner.....	3.24
39.	Job Meetings & Project Superintendant	3.24

TABLE OF CONTENTS

SECTION 3: GENERAL CLAUSES

40.	Patent Warranty	3.25
41.	Materials	3.26
42.	Standard Of Quality	3.29
43.	Proprietary Item	3.29
44.	Shop Drawings.....	3.30
45.	Sequence Of Construction Operations.....	3.34
46.	Protection	3.36
47.	Cleanup And Removal Of Debris	3.36
48.	Temporary Service.....	3.36
49.	Operating Tests	3.37
50.	Operating Instructions And Parts Lists	3.37
51.	Cutting And Patching.....	3.37
52.	Conflicts Among Contract Documents.....	3.39
53.	Record Drawings	3.39
54.	Time	3.40
55.	Acceleration Of The Work.....	3.40
56.	Ultra Low Sulfur Diesel Fuel.....	3.40
57.	Qualified Transportation Fringe Program.....	3.42
58.	Use of Fluorescent Light Bulbs & Energy Efficient Bulbs	3.42
59.	County of Westchester Phosphorus-Free Lawn Fertilizer Policy.....	3.42

TABLE OF CONTENTS

SAMPLE FORMS AND ATTACHMENTS

Sample Forms

Affirmative Action Program Requirement – Subcontractor(s).....Forms Page 1
Contractor’s Report Of Employment And Weekly Affidavit.....Forms Page 2
Monthly Employment Utilization ReportForms Page 4
Shop Drawing Schedule.....Forms Page 5
Shop Drawing IDForms Page 6
Request For Approval Of EqualForms Page 7
Request For Approval Of Substitutions.....Forms Page 8
Contractor’s Ultra Low Sulfur Diesel Fuel Affidavit.....Forms Page 9
Contractor’s Ultra Low Sulfur Diesel Fuel-LOGForms Page 10
Electronic Funds Transfer (EFT)-Vendor Direct Payment Authorization Form.....Forms Page 11

Sample Contract And Bond

Sample Contract And Bond For Construction A-1

Schedule Of Hourly Rates And Supplements

Schedule Of Hourly Rates And Supplements.....B-1

TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS

CONTRACT NO. 22-522

DIVISION 1 – GENERAL REQUIREMENTS

01 11 00	SUMMARY OF WORK
01 19 00	MISCELLANEOUS PROVISIONS
01 20 00	PRICE AND PAYMENT PROCEDURES
01 32 00	CONSTRUCTION SCHEDULE
01 32 33	PHOTOGRAPHIC DOCUMENTATION
01 33 00	SUBMITTAL PROCEDURES
01 35 29	HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES
01 45 00	QUALITY CONTROL
01 55 26	TRAFFIC CONTROL
01 57 19	TEMPORARY ENVIRONMENTAL CONTROLS
01 60 00	PRODUCT REQUIREMENTS
01 71 23	FIELD ENGINEERING
01 73 29	CUTTING AND PATCHING
01 74 00	CLEANING AND WASTE MANAGEMENT
01 77 00	CLOSEOUT PROCEDURES
01 78 39	PROJECT RECORD DOCUMENTS

DIVISION 2 – EXISTING CONDITIONS

02 32 19	EXPLORATORY EXCAVATIONS (TEST PITS)
02 33 13	UNDERGROUND UTILITY LOCATOR SERVICE
02 40 00	DEMOLITION, REMOVALS AND MODIFICATIONS
02 80 00	WASTE TRANSPORTATION AND DISPOSAL

DIVISION 3 – CONCRETE

03 11 00	CONCRETE FORMWORK
03 20 00	CONCRETE REINFORCING
03 30 00	CAST-IN-PLACE CONCRETE
03 34 00	CONTROLLED LOW STRENGTH MATERIAL
03 60 00	GROUTING

DIVISION 4 – MASONRY

04 05 13	MORTAR
04 15 00	MASONRY ACCESSORIES
04 20 10	UNIT MASONRY CONSTRUCTION
04 22 00	CONCRETE UNIT MASONRY

TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS

CONTRACT NO. 22-522

DIVISION 5 – METALS

05 50 30 ANCHOR BOLTS, EXPANSION ANCHORS AND CONCRETE INSERTS

DIVISION 6 - WOOD AND PLASTICS

06 10 00 ROUGH CARPENTRY

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

07 21 00 INSULATION
07 26 13 VAPOR RETARDER UNDER SLABS ON GRADE
07 28 00 WATER RESISTIVE BARRIER AND AIR BARRIER
07 40 00 ALUMINUM SOFFITS, FASCIAS AND WALL PANELS
07 41 10 ALUMINUM ROOF PANELS
07 71 00 MANUFACTURED ROOF SPECIALTIES
07 92 00 JOINT SEALANTS

DIVISION 8 – DOORS AND WINDOWS

08 11 13 HOLLOW METAL DOORS AND FRAMES
08 36 80 OVERHEAD ROLLING DOORS
08 71 00 DOOR HARDWARE
08 90 00 LOUVERS AND VENTS

DIVISION 9 – FINISHES

09 29 00 CEMENT BOARD
09 67 23 RESINOUS FLOORING
09 90 00 PAINTING

DIVISION 10 – SPECIALTIES

10 14 23 PANEL SIGNAGE
10 44 16 PORTABLE FIRE PROTECTION EQUIPMENT

DIVISION 22 – PLUMBING

22 05 00 COMMON WORK RESULTS FOR PLUMBING
22 05 17 SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING
22 05 18 ESCUTCHEONS FOR PLUMBING PIPING
22 05 19 METERS AND GAGES FOR PLUMBING PIPING
22 05 23 GENERAL-DUTY VALVES FOR PLUMBING PIPING
22 05 29 HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
22 05 53 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
22 07 19 PLUMBING PIPING INSULATION
22 11 16 DOMESTIC WATER PIPING
22 11 19 DOMESTIC WATER PIPING SPECIALTIES
22 13 16 SANITARY WASTE AND VENT PIPING

TOC – Technical Specifications 2

TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS

CONTRACT NO. 22-522

22 13 19 SANITARY WASTE PIPING SPECIALTIES

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

23 05 00 COMMON WORK RESULTS FOR HVAC
23 05 13 COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT
23 05 29 HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
23 05 53 IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
23 82 39.16 PROPELLER UNIT HEATERS

DIVISION 26 – ELECTRICAL

26 05 19 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 05 29 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 33 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
26 05 43 UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS
26 05 44 SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING
26 05 53 IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 09 23 LIGHTING CONTROL DEVICES
26 22 13 LOW-VOLTAGE DISTRIBUTION TRANSFORMERS
26 24 16 PANELBOARDS
26 27 26 WIRING DEVICES
26 28 13 FUSES
26 28 16 ENCLOSED SWITCHES AND CIRCUIT BREAKERS
26 51 19 LED INTERIOR LIGHTING
26 52 19 EMERGENCY AND EXIT LIGHTING
26 56 19 LED EXTERIOR LIGHTING

DIVISION 31 – EARTHWORK

31 00 00 EARTHWORK
31 05 16 AGGREGATES FOR EARTHWORK
31 10 00 DEMOLITION AND SITE CLEARING
31 23 16.26 ROCK REMOVAL
31 23 33 TRENCHING AND BACKFILLING
31 25 00 SOIL EROSION AND SEDIMENT CONTROL
31 25 13 EROSION CONTROL MATERIALS
31 40 00 SHORING AND UNTERPINING

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 12 16 ASPHALT PAVEMENTS
32 31 13 CHAIN LINK FENCING
32 92 00 GRASS RESTORATION

TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS

CONTRACT NO. 22-522

DIVISION 33 – UTILITIES

33 05 05	BURIED PIPING INSTALLATION
33 05 19	DUCTILE IRON WATER UTILITY DISTRIBUTION PIPING
33 12 16	WATER UTILITY DISTRIBUTION VALVES
33 12 17	INSERTION VALVE (LIVE SHUT DOWN)
33 12 19	WATER UTILITY DISTRIBUTION FIRE HYDRANTS
33 13 00	DISINFECTION OF WATER UTILITY DISTRIBUTION PIPING
33 14 17	SITE WATER UTILITY SERVICES

APPENDICES

APPENDIX 1	– GEOTECHNICAL REPORT
APPENDIX 2	– SOIL SAMPLE AND GROUNDWATER ANALYSIS
APPENDIX 3	– WATERLINE SOIL AND GROUNDWATER ASSESSMENT
APPENDIX 4	– NYS DEC WORKPLAN & FIGURES
APPENDIX 5	– STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
APPENDIX 6	– LIMITED HAZARDOUS MATERIALS ASSESSMENT
APPENDIX 7	– WESTCHESTER COUNTY DEPARTMENT OF HEALTH (DOH) APPROVAL LETTERS



1. **GENERAL REQUIREMENTS AND PROPOSALS**

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering

GENERAL REQUIREMENTS

1. DESCRIPTION OF THE WORK

Work under this Contract includes all necessary labor, materials and equipment required for:

The work under this contract consists of providing all necessary labor, material and equipment required for the installation of a new water main service and backflow preventer facilities at the Westchester County Airport. The project also includes the installation of a new water service on New King Street, which is a component of a Department of Environmental Conservation Order on Consent.

It is not intended that this description of work mention each particular item required, but that it give information concerning the general scope and areas of work for the convenience of the bidders.

THIS PROJECT IS NOT SUBJECT TO THE REQUIREMENTS OF THE “WICKS LAW”. ACCORDINGLY, EACH BIDDER IS REQUIRED TO SUBMIT SPECIFIC INFORMATION PERTAINING TO ITS PROPOSED SUBCONTRACTORS. PLEASE SEE THE “NOTICE TO CONTRACTORS” THAT FORMS A PART OF THESE BID DOCUMENTS.

GENERAL REQUIREMENTS

2. SUBCONTRACTING & DIRECT EMPLOYMENT OF LABOR

The Contractor shall not subcontract more than forty nine (49%) percent of its bid. The Contractor must directly employ at least fifty one (51%) percent of the personnel working on this contract as measured in man-days worked.

“Directly employ” shall be construed to include only workers employed and paid directly by the Contractor, usually for wages or salary.

The Contractor expressly acknowledges that any violation of this provision constitutes a default under this contract.

3. REQUIRED TIME FOR COMPLETION OF THE WORK

Notification to commence the work will require the mandatory submission of all the executed contracts and the Certificates of Insurance after receipt of authority to award.

The Contractor shall commence the work embraced in this contract within ten (10) days of the service of Notice by the County to do so and shall complete the said work within **540** consecutive calendar days computed from the date of such Notice to commence.

GENERAL REQUIREMENTS

4. SECURITY REGULATIONS

Security Regulations For all County Facilities except County Correctional Facilities:

- A. Contractor's attention is called to the fact that this work is to be performed on property which is the responsibility of the County; therefore, all personnel associated with this contract are subject to special conditions affecting security and control of the facilities operations. Every person required to enter the work site will be issued an ID card and be required to fill out appropriate applications. **There is a \$30.00 processing fee for each lost ID card**; remitted by check made payable to the County of Westchester. All ID processing will be scheduled by the Construction Administrator.
- B. The Contractor/Subcontractor shall issue a copy of the security regulations (Paragraph C) to all personnel engaged on this project.
- C. All Contractor/Subcontractor personnel shall be bound by the following security regulations for the duration of this contract.
 - 1) All personnel must conspicuously display the ID card and identify themselves upon request.
 - 2) If an ID card is misplaced or lost, report this immediately to the Inspector.
 - 3) All Contractor/Subcontractor personnel are responsible for all tools and equipment and you must report any loss immediately to the Construction Administrator.
 - 4) All personnel must observe all orders of the Owner.
 - 5) All personnel are to report any unusual incidents or problems to the Construction Administrator immediately.
 - 6) All personnel shall not possess or consume any alcoholic beverage or illegal drug or medication while on the property, or report to work under the influence of alcohol or drugs.
 - 7) Any vehicle left on the property must be locked and the ignition keys must be removed. Vehicles will not be left overnight without prior approval.
 - 8) All personnel shall not enter any other areas of the premises (except the areas agreed to) without prior approval of the Construction Administrator.

Security Regulations For County Correctional Facilities:

- A. Contractor's attention is called to the fact that this work is to be performed on property adjacent and/or within the County's Correctional Facilities; therefore, all personnel associated with this project are subject to special conditions affecting security and control of the Correctional Facility Operations. Every person required to enter the work site will be fingerprinted, processed for a photo ID card and be required to fill out appropriate applications. **There is a \$100.00 processing fee for each person**, checks made payable to the Commissioner of Finance. All ID processing will be scheduled by the Construction Administrator.
- B. All Contractors and Subcontractors shall issue a copy of the security regulations (Paragraph C) to all personnel to be engaged on this project.
- C. All Contractor's and Subcontractor's personnel shall be bound by the following security regulations for the duration of this project.
 - 1) All personnel entering the Penitentiary, Jail or Women's Unit must stop and identify themselves to the Control or Desk Officer who will issue the appropriate pass after

GENERAL REQUIREMENTS

ascertaining that they have been cleared to enter the facility. Only workers with valid ID will be permitted entry. **NO HELPERS.**

- 2) All personnel must sign in the Visitor's Book, to include the following information: **PERSON'S NAME, COMPANY NAME, REASON FOR ENTRY, WORK LOCATION IN BUILDING.**
- 3) All personnel must conspicuously display the ID card and identify themselves upon request.
- 4) If ID card is misplaced or lost, report this loss immediately to the Shift Captain or Associate Warden.
- 5) All tradesmen will be required to perform a tool inventory inspection of all tools in their possession to demonstrate to the admitting Correction Officer that the typed inventory list matches the tools each time they enter and leave the building. The tradesmen are responsible for keeping all tools and equipment locked when not in immediate use and they must report any loss of tools or equipment immediately to the Shift Captain or Associate Warden.
- 6) All tradesmen and helpers shall carry all tools in a locked and secured tool box or tool cart. A typed inventory sheet shall be carried with the tool box/cart listing all hand and power tools. A manufacturer's MSD Sheet shall be carried with the tool box/cart for any chemical compound that the tradesman has in his/her possession.
- 7) All debris (i.e. packaging, demolition, etc) shall be removed from the worksite at the end of each workday.
- 8) All personnel are subject to search at all times.
- 9) All personnel must observe all orders of Correctional Staff.
- 10) All personnel are to report any unusual incidents or problems to a Correction Officer, Shift Captain or the Associate Warden immediately.
- 11) All personnel shall not possess or consume any alcoholic beverage or illegal drug or medication while on County property, or report to work under the influence of alcohol or drugs.
- 12) Any vehicle left on County property must be locked and the ignition keys must be removed. Vehicles will not be left over-night on County property without prior approval.
- 13) All personnel shall not enter any other areas of the prison (except the areas agreed to) without prior approval of the Shift Captain or the Associate Warden.
- 14) All personnel shall not bring anything in for any inmate/detainee or staff member or take out anything for any inmate/detainee or staff member.
- 15) All personnel shall not engage in any unnecessary conversations with any inmate/detainee.
- 16) Weapons, i.e., guns, knives, blackjacks, to include any tool activated by gunpowder or other explosive charge is prohibited in the building (i.e., stud gun). Violators of this rule are subject to arrest.
- 17) All personnel must sign out when leaving and must return the ID card to the Control/Desk Officer before leaving.

GENERAL REQUIREMENTS

- 18) Failure of the contractor to follow these procedures will result in the contractor being denied access to the facility.

5. PAYMENT FOR BONDS AND INSURANCE

The amount bid for contract bonds and insurance shall not exceed 3% of the total contract price excluding the bid price for Miscellaneous Additional Work (Item W800) and Field Testing Equipment (W851), where applicable. Should the bidder exceed the foregoing three percent (3%), the Department will make the necessary adjustment to determine the total amount bid based on the arithmetically correct proposal.

The amount bid shall be payable with the first contract payment.

GENERAL REQUIREMENTS

CONTRACT DRAWINGS:

CONTRACT NUMBER 22-522

The Design Drawings, as listed on the Contract Drawing Index, herewith made a part of these Specifications, shows in general and/or in detail the work to be done under this Contract and/or the various Contracts forming the entire work for the Project, as described herein.

After sending the executed contract to the County and prior to the first job meeting, the Contractor is responsible for obtaining from Public Works, Division of Engineering, Michaelian Office Building, White Plains, a maximum of five gratis copies of the Contract Drawings and Specifications; for the Contractor's permanent possession. Additional sets, requested by the Contractor, beyond the permitted number and time limit, will be furnished by Public Works; but at the Contractor's expense.

SHEET NO.				SHEET TITLE	DPW FILE NO:
T-001	1	OF	61	TITLE SHEET	48-17-T-126
T-002	2	OF	61	DRAWING LIST	48-17-T-127
CIVIL					
G-01	3	OF	61	LEGEND, ABBREVIATIONS AND NOTES	48-17-C-128
G-02	4	OF	61	NOTES	48-17-C-129
C-01	5	OF	61	CONSTRUCTION ACCESS AND STAGING PLAN	48-17-C-130
C-02	6	OF	61	WATER LINE KEY PLAN	48-17-C-131
C-03	7	OF	61	ALIGNMENT PLAN NO. 1	48-17-C-132
C-04	8	OF	61	ALIGNMENT PLAN NO. 2	48-17-C-133
C-05	9	OF	61	ALIGNMENT PLAN NO. 3 & BFP BUILDING & VAULT SITE PLAN	48-17-C-134
C-06	10	OF	61	ALIGNMENT PLAN NO. 4	48-17-C-135
C-07	11	OF	61	ALIGNMENT PLAN NO. 5	48-17-C-136
C-08	12	OF	61	ALIGNMENT PLAN NO. 6	48-17-C-137
C-09	13	OF	61	ALIGNMENT PLAN NO. 7	48-17-C-138
C-10	14	OF	61	ALIGNMENT PLAN NO. 8	48-17-C-139
C-11	15	OF	61	ALIGNMENT PLAN NO. 9	48-17-C-140
C-12	16	OF	61	PROFILE NO. 1	48-17-C-141
C-13	17	OF	61	PROFILE NO. 2	48-17-C-142
C-14	18	OF	61	PROFILE NO. 3	48-17-C-143
C-15	19	OF	61	PROFILE NO. 4	48-17-C-144
C-16	20	OF	61	FLOW METER AND PRV VAULT	48-17-C-145
C-17	21	OF	61	WATER LINE DETAILS NO. 1	48-17-C-146
C-18	22	OF	61	WATER LINE DETAILS NO. 2	48-17-C-147
C-19	23	OF	61	SITE DETAILS NO. 1	48-17-C-148
C-20	24	OF	61	SITE DETAILS NO. 2	48-17-C-149

Contract Drawings 1

GENERAL REQUIREMENTS

C-21	25	OF	61	SITE DETAILS NO. 3	48-17-C-150
C-22	26	OF	61	EROSION AND SEDIMENT CONTROL PLAN NO. 1	48-17-C-151
C-23	27	OF	61	EROSION AND SEDIMENT CONTROL PLAN NO. 2	48-17-C-152
C-24	28	OF	61	EROSION AND SEDIMENT CONTROL PLAN NO. 3	48-17-C-153
C-25	29	OF	61	EROSION AND SEDIMENT CONTROL PLAN NO. 4	48-17-C-154
C-26	30	OF	61	EROSION AND SEDIMENT CONTROL PLAN NO. 5	48-17-C-155
C-27	31	OF	61	EROSION AND SEDIMENT CONTROL PLAN NO. 6	48-17-C-156
C-28	32	OF	61	EROSION AND SEDIMENT CONTROL DETAILS	48-17-C-157
C-29	33	OF	61	GROUNDWATER MANAGEMENT PLAN	48-17-C-158
C-30	34	OF	61	MAINTENANCE AND PROTECTION OF TRAFFIC PLAN	48-17-C-159
ARCHITECTURAL					
A-001	35	OF	61	ARCHITECTURAL CODE ANALYSIS	48-17-A-160
A-101	36	OF	61	ARCHITECTURAL BACKFLOW PREVENTION BUILDING PLANS - AIRPORT RD	48-17-A-161
A-201	37	OF	61	ARCHITECTURAL BACKFLOW PREVENTION BUILDING PLANS - TOWER RD	48-17-A-162
A-301	38	OF	61	ARCHITECTURAL BACKFLOW PREVENTION BUILDING DOOR SCHEDULE AND DETAILS	48-17-A-163
A-401	39	OF	61	ARCHITECTURAL BACKFLOW PREVENTION BUILDING WALL SECTIONS AND DETAILS	48-17-A-164
A-501	40	OF	61	ARCHITECTURAL BACKFLOW PREVENTION BUILDING STRUCTURAL NOTES	48-17-A-165
A-601	41	OF	61	VAULT FOUNDATION	48-17-A-166
PLUMBING					
P-001	42	OF	61	PLUMBING SYMBOLS, ABBREVIATIONS & GENERAL NOTES	48-17-P-167
P-002	43	OF	61	PLUMBING SITE PLAN - TOWER ROAD	48-17-P-168
P-003	44	OF	61	PLUMBING SITE PLAN - AIRPORT ROAD	48-17-P-169
P-101	45	OF	61	PLUMBING DEMOLITION PLAN - TOWER RD	48-17-P-170
P-201	46	OF	61	PLUMBING NEW WORK PLAN - TOWER RD	48-17-P-171
P-202	47	OF	61	PLUMBING NEW WORK PLAN - AIRPORT RD	48-17-P-172
P-301	48	OF	61	PLUMBING EQUIPMENT SPECIFICATIONS	48-17-P-173
P-701	49	OF	61	PLUMBING DETAILS	48-17-P-174
MECHANICAL					
M-001	50	OF	61	MECHANICAL SYMBOLS, ABBREVIATIONS & GENERAL NOTES	48-17-M-175
M-201	51	OF	61	MECHANICAL DEMOLITION & NEW WORK PLAN - TOWER RD	48-17-M-176
M-202	52	OF	61	MECHANICAL NEW WORK PLAN - AIRPORT RD	48-17-M-177
ELECTRICAL					
E-001	53	OF	61	ELECTRICAL SYMBOLS AND ABBREVIATIONS	48-17-E-178
E-002	54	OF	61	ELECTRICAL GENERAL NOTES AND DEFINITION OF TERMS	48-17-E-179
E-100	55	OF	61	ELECTRICAL SITE PLAN - TOWER RD & NORTH COMPLEX BUILDING	48-17-E-180
E-101	56	OF	61	ELECTRICAL TOWER RD BUILDING PLAN - DEMOLITION	48-17-E-181
E-201	57	OF	61	ELECTRICAL TOWER RD BUILDING PLAN - POWER, LIGHTING & FIRE ALARM	48-17-E-182
E-202	58	OF	61	ELECTRICAL AIRPORT RD. BUILDING PLAN - POWER, LIGHTING & FIRE ALARM	48-17-E-183
E-501	59	OF	61	ELECTRICAL ONE-LINE DIAGRAM	48-17-E-184
E-701	60	OF	61	ELECTRICAL DETAILS	48-17-E-185
E-702	61	OF	61	ELECTRICAL DETAILS	48-17-E-186

Contract Drawings 2

Submit all proposal pages in this section, including all executed and unexecuted pages and fasten with a clip at the upper left hand corner.



George Latimer, Westchester County Executive

PROPOSAL PAGES

DOMESTIC WATER SYSTEM IMPROVEMENTS WESTCHESTER COUNTY AIRPORT TOWNS OF HARRISON AND NORTH CASTLE AND VILLAGE OF RYE BROOK, NEW YORK

Contract No. 22-522

Bid Opening: January 11, 2023

By Bidder (Please Print)	For Official Use Only
Firm/Business Name: _____	
Address: _____	
_____	_____

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

Division of Engineering

PROPOSAL REQUIREMENTS

BIDDER'S IDENTIFICATION

CONTRACT NO. _____

To the Commissioner of Public Works, Westchester County, New York, acting for the party of the first part.

Proposal made by _____
as party of the second part.

Whose business address is _____

Whose telephone number is _____

Whose E-mail address is _____

Whose Federal ID number is _____

Is bidder an individual,
a partnership or a corporation? _____

If a partnership or corporation,
give the names of all partners
or officers with their titles _____

If operating under a trade name or as partners, has the required Certificate been filed with a County Clerk in accordance with the General Business Law, Section 130?

Yes....[] No....[] N.A....[]

If the answer is NO, Certificate must be filed before the contract can be executed.

NOTE: the bid must be submitted using the Contractor's legal name, not just the "doing business as" (i.e. DBA) name.

COMPLETE THIS FORM USING BLACK INK ONLY

PROPOSAL REQUIREMENTS

1. The undersigned, the bidder, does hereby declare that it has carefully read the contract specifications and has carefully studied the relevant plans, profiles and other drawings (as defined in Article "Contract Drawings" of the General Requirements) relating to the contract work, and has inspected the site(s) of the work..
2. The undersigned does hereby declare that it is the only one interested in its indicated bid; that the bid is in all respects without fraud or reservations; and that no official of the County or of the participating municipalities (if any), or any person in the employ of the County of participating municipalities (if any) is directly interested in the contract bid or in the supplies, equipment or works to which it relates, or in any part of the profits resulting there-from.
3. The undersigned does hereby offer and agree to furnish all materials, to fully and faithfully construct, perform and execute all work under the contract in accordance with the plans, profiles, other drawings and specifications relating thereto, and to furnish all labor, tools, implements, machinery, forms, transportation and materials necessary and proper for said purpose at the following indicated lump sum price for the total work and/or the following indicated unit prices for the various items of the work.
4. The undersigned does hereby declare that the indicated price(s) cover all expenses of every kind incidental to the completion of the contract work, including all claims affecting the work, labor and materials, which may arise through any cause whatsoever, excepting as provided for in Article "Disputed Work-Notice Of Claims For Damages: of the General Clauses.
5. The undersigned hereby agrees that in the event that the quantities of contract work actually performed by the undersigned are less than the approximate quantities indicated in the specifications it will make no claim(s) for loss of anticipated profits.
6. The undersigned does hereby agree that it will execute a contract containing all the terms, conditions, provisions and covenants necessary to complete the work according to the appropriate plans and specifications, within ten working days after receipt by the undersigned of the contract from the County, and that if it fails to execute said contract within said period of time the County may rescind the contract award and may retain as liquidated damages and not as a penalty, any amounts submitted as the bid security accompanying the undersigned's proposal, and/or demand from the Bidder's Surety Company that executed the required Bid Bond and Consent of Surety to pay to the County the difference between the amount bid and the amount for which such contract is thereafter awarded, together with the cost to the County of reletting said contract up to the maximum aggregate amount of 25% of the amount bid.
7. The undersigned does hereby agree to commence the work encompassed under the contract within ten days after notification in writing from the Commissioner of Public Works or his authorized designee, unless a definite earlier or later start has been specified, and will complete the work fully and in every respect on or before the specified completion date; and further agrees that the County has the right to employ such combination of labor, equipment

PROPOSAL REQUIREMENTS

and materials as may be required for the proper completion of the contract work and to deduct all costs from such monies as may be due the undersigned, in the event the contract work is not completed by the specified completion date.

- 8. The undersigned does hereby agree to comply with all relevant provisions of the Labor Laws of the State of New York, and agrees to adhere to the provisions relating to the eight-hour day and five-day week, the payments of minimum rates for labor, and the latest laws relative to payments for wages for labor on public contracts.

- 9. The undersigned does hereby agree to insure all persons connected with the contract work against accident, at its own expense, as prescribed by the Workmen's Compensation Law of the State of New York; and that it will be responsible for payments by itself, its subcontractors and vendors of all taxes applicable to the work, and all other payments as may be required by various laws and rules and regulations of the Federal Government, the State of New York and its political subdivisions and agencies, such payments including but not limited to the following:
 - A. Federal Social Security Taxes on employees' wages.
 - B. Applicable Federal Excise Taxes.
 - C. New York State Unemployment Insurance and Disability Payments, based on employees' wages.

- 10. The undersigned does hereby agree to accept their indicated lump sum price for the total work and/or their indicated unit prices for the various items of the work as the sole basis in the determination of the value of addition to, or deletions from the specified scope of the contract work.

11. ADDENDUM RECEIPT - CONTRACT NO. _____

(The undersigned shall fill in contract number above, and the required information below.)

The undersigned does hereby acknowledge receipt of the below listed addenda to the contract specifications:

Addendum No. _____	Dated _____

COMPLETE THIS FORM USING BLACK ONLY

PROPOSAL REQUIREMENTS

12. Bidders should not submit the entire Bid document with its bid submission. Instead, Bidders must submit ALL of the Proposal Pages. Proposal Pages are denoted by a border and are titled on the bottom as "Proposal Page ___".

Be sure that, where required, the forms have been completed and signed by a notary public.

Proposal Page 12 must be completed by a surety company and submitted with the bid if a Performance and Payment Bond is required in accordance with the "Notice to Contractors".

13. NON-COLLUSIVE BIDDING CERTIFICATION

Made pursuant to Section 103-d of the General Municipal Law of the State of New York as amended by the Laws of 1966.

- A. By submission of this bid, each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of his knowledge and belief:
- 1) The prices in this bid have been arrived at independently without collusion, consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;
 - 2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly, to any other bidder or to any competitor; and
 - 3) No attempt has been made or will be made by the bidder to induce any other person, partnership or corporation to submit or not to submit a bid for the purpose of restricting competition.
- B. A bid shall not be considered for award nor shall any award be made where a. (1), (2) and (3), above, have not been complied with; provided however, that if any case the bidder cannot make the foregoing certification, the bidder shall so state and shall furnish with the bid a signed statement which sets forth in detail the reasons therefore. Where a. (1), (2) and (3), above, have not been complied with, the bid shall not be considered for award nor shall any award be made unless the head of the purchasing unit of the political subdivision, public department, agency or official thereof to which the bid is made, or his designee, determines that such disclosure was not added for the purpose of restricting competition."
14. The undersigned and each person signing in behalf of the undersigned hereby executes the foregoing Affirmative Action Questionnaire, Proposal, Addendum Receipt and Non-Collusive Bidding Certification.
15. The undersigned and each person signing on behalf of the undersigned hereby certifies that

PROPOSAL REQUIREMENTS

the person, firm or corporation submitting this proposal as the bidder has not been found guilty of a willful violation of the New York State Labor Law for failure to pay prevailing wages and supplements, as those terms are defined by the New York State Labor Law, within the twelve (12) months immediately preceding the submission of this bid.

16. The undersigned, by submitting the Proposal Pages, acknowledges that it has read the complete bid package including any and all addenda thereto and its bid includes all of the terms and conditions set forth in the bid documents, including, but not limited to, the Notice to Contractors, General Requirements and Proposals, Contract plans/drawings (if any), Proposal Forms, Information for Bidders, General Clauses, Sample Forms and Attachments, Sample Contract and Bond, Schedule of Hourly Rates and Supplements, Technical Specifications, any Special Notices and all applicable laws, rules and regulations. The undersigned further acknowledges that by submitting this bid the above denoted items are incorporated by reference and constitute an integral part of its bid.
17. The undersigned agrees that, if it is not the Successful bidder, the Sealed List of Subcontractors submitted with its bid can be destroyed by the County. **Please check the following box if you want the Sealed List of Subcontractors returned to you.**

Dated _____, 20__

Legal Name of Person, Firm or Corporation

(Seal of Corporation)

Business Address of Person, Firm or Corporation

By _____
Signature

Title

COMPLETE THIS FORM USING BLACK INK ONLY

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
A	NEC	LS	Soil Erosion and Sediment Control	\$ _____	_____	\$ _____	_____
B	NEC	LS	Traffic Control	\$ _____	_____	\$ _____	_____
C	1	DC	Con Edison Fee Allowance			\$ 50,000	00
D	5900	LF	Cement Lined Ductile Iron Water Main Pipe - 12" Diameter, Furnished and Installed	\$ _____	_____	\$ _____	_____
E	45	LF	Cement Lined Ductile Iron Water Main Pipe - 10" Diameter, Furnished and Installed	\$ _____	_____	\$ _____	_____
F	90	LF	Cement Lined Ductile Iron Water Main Pipe - 6" Diameter, Furnished and Installed	\$ _____	_____	\$ _____	_____
G	320	LF	Cement Lined Ductile Iron Water Main Pipe - 4" Diameter, Furnished and Installed	\$ _____	_____	\$ _____	_____
H	30000	Pound	Miscellaneous Water Min Fittings (Elbows, Bends, Fittings and Tees), Furnished and Installed	\$ _____	_____	\$ _____	_____
I	33	EA	Inline Gate Valve - 12", Furnished and Installed	\$ _____	_____	\$ _____	_____
J	2	EA	Inline Gate Valve - 10", Furnished and Installed	\$ _____	_____	\$ _____	_____

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
K	12	EA	Inline Gate Valve - 6", Furnished and Installed	\$ _____	_____	\$ _____	_____
L	11	EA	Inline Gate Valve - 4", Furnished and Installed	\$ _____	_____	\$ _____	_____
M	2	EA	Insertion Valve (Live Shut Down) - 12", Furnished and Installed	\$ _____	_____	\$ _____	_____
N	12	EA	Fire Hydrant Assembly, Furnished and Installed	\$ _____	_____	\$ _____	_____
O	1000	CY	Rock Removal and Disposal	\$ _____	_____	\$ _____	_____
P	260	Ton	Temporary Asphalt Pavement	\$ _____	_____	\$ _____	_____
Q	330	Ton	Asphalt Top Course, Furnished and Placed	\$ _____	_____	\$ _____	_____
R	520	Ton	Asphalt Binder Course, Furnished and Placed	\$ _____	_____	\$ _____	_____
S	7300	LF	Pavement Sawcutting	\$ _____	_____	\$ _____	_____
T	780	CY	Sub-base Course, Furnished and Placed	\$ _____	_____	\$ _____	_____
U	440	CY	Select Fill, Furnished and Placed	\$ _____	_____	\$ _____	_____

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
V	970	CY	Bedding Sand, Furnish and Place	\$ _____	_____	\$ _____	_____
W	170	CY	Exploratory Excavation (Test Pits)	\$ _____	_____	\$ _____	_____
X	1450	CY	Controlled Low Strength Material	\$ _____	_____	\$ _____	_____
Y	2800	CY	Waste Transportation and Disposal	\$ _____	_____	\$ _____	_____
Z	970	CY	Crushed Stone, Furnished and Placed	\$ _____	_____	\$ _____	_____
AA	90	CY	Topsoil, Furnished and Placed	\$ _____	_____	\$ _____	_____
BB	800	SY	Grass Seed, Furnished and Placed	\$ _____	_____	\$ _____	_____
CC	NEC	LS	Culvert Replacement	\$ _____	_____	\$ _____	_____
DD	NEC	LS	Meter Vault, Furnish and Install	\$ _____	_____	\$ _____	_____
EE	NEC	LS	Tower Road Backflow Preventer Building	\$ _____	_____	\$ _____	_____
FF	NEC	LS	Airport Road Backflow Preventer Building	\$ _____	_____	\$ _____	_____

CONTRACT NO. _____ 22-522

ITEMIZED PROPOSAL

ITEM NO.	APPROXIMATE QUANTITIES	PAY UNIT	ITEM DESCRIPTION	UNIT BID PRICE		AMOUNT BID	
				DOLLARS	CTS.	DOLLARS	CTS.
GG	NEC	LS	Groundwater Treatment and Disposal	\$ 800,000			00
Subtotal of All Items Above:				\$			
HH	NEC	LS	MOBILIZATION (Must not exceed 2.00% of Subtotal Shown Above)	\$			
II	NEC	LS	CONTRACT BONDS AND INSURANCE (Must not exceed 3.00% of Subtotal Shown Above)	\$			
W800	1	DC	MISCELLANEOUS ADDITIONAL WORK	\$ 1,000,000			00
W851	1	DC	TESTING OF MATERIALS AND FIELD TESTING EQUIPMENT	\$ 100,000			00
Gross Sum of Total Bid Written in Figures:				\$			

CONTRACTOR: _____

ADDRESS: _____

SIGNED BY AND DATE: _____

CONTRACTOR'S ACKNOWLEDGMENT

(If Corporate)

STATE OF NEW YORK)
COUNTY OF WESTCHESTER) ss.:

On this _____ day of _____, 20____, before me personally came _____
_____ to me known and known to me to be the _____
_____ of _____ the corporation described in and which
executed the within instrument, who being by me duly sworn did depose and say that he the said_
_____ resides at _____
_____ and that he is _____ of said corporation and knows the corporate
seal of the said corporation; that the seal affixed to the within instrument is such corporate seal and
that it was so affixed by order of the Board of Directors of said corporation, and that he signed his
name thereto by like order.

Notary Public

CONTRACTOR'S ACKNOWLEDGMENT

(If Individual)

STATE OF NEW YORK)
COUNTY OF WESTCHESTER) ss.:

On this _____ day of _____, 20____, before me personally came _____
_____ to me known, and known to me to be the same person described in
and who executed the within instrument and he duly acknowledged to me that he executed the same
for the purpose herein mentioned and, if operating under the trade name, that the certificate required
by the New York State General Business Law Section 130 has been filed with the County Clerk of
Westchester County.

Notary Public

CONTRACTOR'S ACKNOWLEDGMENT

(If Co-Partnership)

STATE OF NEW YORK)
COUNTY OF WESTCHESTER) ss.:

On this _____ day of _____, 20____, before me personally came _____
_____ to me known, and known to me to be a member of the firm of
_____ and the person described in, and who executed the
within instrument in behalf of said firm, and he acknowledged to me that he executed the same in
behalf of, and as the act of said firm for the purposes herein mentioned and that the certificate
required by the New York State General Business Law Section 130 has been filed with the County
Clerk of Westchester County.

Notary Public

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF AUTHORITY

I, _____
(Officer other than officer executing proposed documents)

certify that I am _____ of the
(Title)

(Name of Contractor)

(the "Contractor"), a corporation duly organized and in good standing under the

(Law under which organized, e.g., the New York Business Corporation Law)

named in the foregoing agreement; that _____
(Person executing proposal documents)

who signed said agreement on behalf of the Contractor was, at the time of execution the

_____ of the Contractor; that said agreement was
(Title of such person)

duly signed for and in behalf of said Contractor by authority of its Board of Directors, thereunto

duly organized, and that such authority is in full force and effect at the date hereof.

(Signature)

(SEAL)

STATE OF NEW YORK)
) ss.:
COUNTY OF)

On this _____ day of _____, 20____, before me personally came
_____ to me known, and known to me to be
the _____ of _____, the
Corporation described in and which executed the above certificate, who being by me duly sworn did
depose and say that he, the said _____ resides at
_____ and that he is _____
_____ of said Corporation and knows the Corporate Seal of the said
Corporation; that the seal affixed to the above certificate is such Corporate Seal and that it was so
affixed by order of the Board of Directors of said Corporation, and that he signed his name thereto
by like order.

Notary Public

COMPLETE THIS FORM IN BLACK INK ONLY

***Required for all Bids over \$100,000 where a Performance & Payment Bond
is Required in accordance with the "Notice to Contractors"***

CONTRACT NO. _____

BID BOND AND CONSENT OF SURETY

KNOW ALL PERSONS BY THESE PRESENTS, That _____
(Name of Contractor)

(Address)

(hereinafter called the "Principal") and the _____ a
corporation created and existing under the laws of the State of _____, having its principal office
at _____ (hereinafter called the "Surety"),

(PRINT FULL ADDRESS OF SURETY)

are held and firmly bound unto the County of Westchester (hereinafter called the "Obligee"), in the full just
sum of *Twenty-Five (25%) Percent of the Attached Bid*, good and lawful money of the United States of
America, for the payment of which said sum of money, well and truly to be made and done, the said
Principal binds themselves (himself/herself, itself), their (his/her, its) heirs, executors and administrators,
successors and assigns, and the said Surety binds itself, its successors and assigns jointly and severally,
firmly by these presents:

WHEREAS, the said Principal has submitted to the County of Westchester, New York, a
proposal/bid for Contract Number: _____
Project Title: _____ and

WHEREAS, under the terms of the Laws of the State of New York as above indicated, the said
Principal has filed or intends to file this bond to guarantee that the Principal will execute all required contract
documents, furnish all required insurance and furnish such Performance and Payment Bonds or other bonds
as may be required in accordance with the terms of the Principal's said proposal/bid.

NOW, THEREFORE, the Surety agrees:

(i) if the Contract for which the preceding estimate and proposal is made, is awarded to the Bidder by
the County, the Surety shall become bound as Surety and guarantor for the faithful performance of the
Contract and shall execute and deliver a Performance & Payment Bond, in a form acceptable to the County,
in the amount of 100% of the total Contract price, or such other amount as may be specified in the Bid
documents, and shall execute the Contract as party of the third part when required to do so by the Board of
Acquisition and Contract of the County; and

(ii) if the Bidder shall, upon award of the Contract to the Bidder, fail or refuse to execute the Contract
and furnish the necessary bonds and insurance certificates, the Surety shall, on demand by the County, pay to
the County the difference between the amount bid and the amount for which such contract is thereafter
awarded, together with the cost to the County of reletting said Contract, up to the maximum aggregate
amount of this bond.

(iii) the condition of the foregoing obligation is such, that if the said Principal shall promptly execute
and submit, and the County shall accept, all required contract documents including insurance and such
Performance and Payment Bond or other bonds, all as may be required in accordance with the terms of the
Principal's said bid/proposal, then this obligation shall be null and void, otherwise to remain in full force and
virtue.

The Surety, for value received, the receipt of which is hereby acknowledged by the Surety, hereby stipulates and agrees that the obligation of the Surety and of its bond shall remain absolute and shall be in no way impaired, affected or discharged by an extension of time, mutually agreed to by the County and the Bidder, within which the County may award said Contract, and the Surety hereby waives notice of any such extension.

IN TESTIMONY WHEREOF, the said Principal has hereunto set his/her (their, its) hand and the said Surety has caused this instrument to be signed by its duly authorized officer this _____ day of _____ 200__.

Signed and delivered this ____ day of _____ 20____ in the presence of:

(Print Name of Contractor)

_____ Principal
(Signature)

(Title of Authorized Officer)

(Print Name of Surety)

By _____ Surety
(Signature)

(Title of Authorized Officer)

(The Surety Company shall append a single copy of a statement of its financial condition, a copy of the resolution authorizing the execution of Bonds by officers of the Surety Company, Power of Attorney, Surety Acknowledgment.)

AFFIRMATIVE ACTION PROGRAM REQUIREMENT

Affirmative Action Program

An approved Affirmative Action Plan shall be required in all contracts for public work where the awarded contract amount exceeds \$50,000 or more than fourteen (14) persons are employed by the Contractor and/or his subcontractors.

Does the Contractor participate in an approved Affirmative Action Program? Yes [] No []

If Yes, give name of Program: _____

If No, how many employees (total) does the Contractor employ. Please also include in your count the number of employees the Contractor and its Subcontractors expect to use on this project: _____

An approved Affirmative Action Program shall mean a plan approved or adopted by Westchester County including but not limited to, the Home-Town Plan, the Recruitment Training Program or any other program approved or meeting the requirements of the State or Federal government.

The "Monthly Employment Utilization Report" of the Sample Forms, shall be filled out by the Contractor and/or Subcontractor(s) who are required to have an Affirmative Action Program, prior to the start of the work.

Before any subcontractor is approved for use on this contract it will have to complete and submit the "Affirmative Action Program Requirement- Subcontractors" form of the Sample Forms.

COMPLETE THIS FORM USING BLACK INK ONLY

APPRENTICESHIP TRAINING PROGRAM REQUIREMENT

Apprenticeship Training Program

An approved Apprenticeship Training Program shall be required in all contracts for public work where the awarded contract amount exceeds \$50,000. and more than fourteen (14) persons are employed by the Contractor or Subcontractor(s).

Will the Contractor utilize apprentices for this Contract? Yes [] No []

If Contractor Yes, do the apprentices participate in an approved Apprenticeship Training Program? Yes [] No []

If Contractor Yes, give the name of the Program: _____

Will the Subcontractor(s) utilize apprentices for this Contract? Yes [] No []

If Subcontractor(s) Yes, do the apprentices participate in an approved Apprenticeship Training Program? Yes [] No []

If Subcontractor(s) Yes, give the name of the Program: _____

AN APPROVED APPRENTICESHIP TRAINING PROGRAM SHALL MEAN A NEW YORK STATE REGISTERED APPRENTICESHIP TRAINING PROGRAM AS DEFINED UNDER THE NEW YORK STATE LABOR LAW.

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF LICENSE

(TO BE COMPLETED BY AN ELECTRICAL BIDDER ONLY)

_____, being duly sworn
(Name)

deposes and says that the following statements are true:

(1) I am the _____ of the
(Title)

_____, the bidder named on the
(Name of Contractor)

bid proposal, and I have read and am familiar with: a) the electrical license requirements contained in the Information for Bidders of the bid, b) Chapter 277 Article XVII of the Laws of Westchester County entitled Electrical Licensing Board and the Licensing of Master Electricians, and c) the Westchester County Electrical Licensing Board Rules and Regulations.

(2) I am familiar with, and this bid is being submitted in compliance with, the Westchester County Electrical Licensing Board Rules and Regulations, in particular No. 11, which states as follows:

No individual holding a Master Electrician’s License shall lend such License to any person or allow any other person to carry on, engage in, or labor at the business as defined herein of installing, removing, altering, testing, replacing, or repairing electrical systems. A violation of this section by any person holding a License shall be sufficient cause for revocation of such License.

However, nothing herein shall be construed to prohibit the use of a License by the holder thereof for or on behalf of a partnership, corporation or other business association, provided that fifty-one (51) percent or more of the control of the voting capital stock of such partnership, corporation, or other business association is owned by one (1) or more holders of a Westchester County Master Electrical License and that all work performed by such partnership, corporation or other business association is performed by or under the direct supervision of such License holder or holders.

(3) That, as of this date, the bidder submitting the bid possesses the applicable valid Master/”Special” Electrician’s license issued by the Westchester County Electrical Licensing Board; that this License is being used in compliance with the Laws of Westchester County and Westchester County Electrical Licensing Board Rules and Regulations; and **I have provided a copy of such license with the sealed bid proposal.**

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF LICENSE (Continued)

(TO BE COMPLETED BY AN ELECTRICAL BIDDER ONLY)

(4) That all electrical work shall be performed in accordance with the requirements of Chapter 277 Article XVII of the Laws of Westchester County entitled Electrical Licensing Board and the Licensing of Master Electricians and the Westchester County Electrical Licensing Board Rules and Regulations.

(5) That I make this statement in connection with the submission of the bid as proof of the required electrical license, knowing that this statement will be relied upon by the County in the evaluation of that bid.

Signature

Sworn to before me
this _____ day of _____

License No.

Notary Public - State of New York

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF LICENSE

(TO BE COMPLETED BY A PLUMBING BIDDER ONLY)

_____, being duly sworn
(Name)

deposes and says that the following statements are true:

(1) I am the _____ of the
(Title)

_____, the bidder named on the
(Name of Contractor)

bid proposal, and I have read and am familiar with: a) the plumbing license requirements contained in the Information for Bidders of the bid, b) Chapter 277 Article XV of the Laws of Westchester County entitled Westchester County Board of Plumbing Examiners and County-wide Plumbing License, and c) the Westchester County Board of Plumbing Examiners Rules and Regulations.

(2) I am familiar with, and this bid is being submitted in compliance with, Section 277.509A of Article XV of Chapter 277 of the Laws of Westchester County, which states as follows:

A. No holder of a license or certification issued under this article shall authorize, consent to or permit the use of his or her license or certification by or on behalf of any other person. No person who has not qualified or obtained a license or certification under this article shall represent himself or herself to the public as holder of a license or certification issued under this article, either directly, by means of signs, sign cards metal plates or stationery, or indirectly in any other manner whatsoever. However, nothing herein shall be construed to prohibit the use of a license by the holder thereof for or on behalf of a partnership, corporation or other business association, provided that 51 percent or more of the control of the voting capital stock of such partnership, corporation or other business association is owned by one or more holders of a Westchester County master plumbing license and that all work performed by such partnership, corporation or other business association is performed by or under the direct supervision of such license holder or holders.

(3) That, as of this date, the bidder submitting the bid possesses a valid Master Plumber's license issued by the Westchester County Board of Plumbing Examiners; that this License is being used in compliance with the Laws of Westchester County and the Westchester County Board of Plumbing Examiners Rules and Regulations; and **I have provided a copy of such license with the sealed bid proposal.**

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF LICENSE (Continued)

(TO BE COMPLETED BY A PLUMBING BIDDER ONLY)

(4) That all plumbing work shall be performed in accordance with the requirements of Chapter 277, Article XV of the Laws of Westchester County entitled Westchester County Board of Plumbing Examiners and County-wide Plumbing License, and the Westchester County Board of Plumbing Examiners Rules and Regulations.

(5) That I make this statement in connection with the submission of the bid as proof of the required plumbing license, knowing that this statement will be relied upon by the County in the evaluation of that bid.

Signature

Sworn to before me
this _____ day of _____

License No.

Notary Public - State of New York

COMPLETE THIS FORM USING BLACK INK ONLY

CERTIFICATE OF LICENSE

(TO BE COMPLETED BY A HAULING BIDDER OR SUBCONTRACTOR ONLY)

_____, being duly sworn
(Name)

deposes and says that the following statements are true:

(1) I am the _____ of the
(Title)

_____, the bidder/subcontractor (circle one)
(Name of Contractor)

named on the foregoing bid proposal, and I have read and am familiar with the hauling license requirements contained in the Information for Bidders of the foregoing bid.

(2) That, as of this date, the bidder submitting the foregoing bid/subcontractor of the bidder submitting the foregoing bid (circle one) possesses a valid _____ license
(License type, i.e. Class "A")

issued by the Westchester County Solid Waste Commission.

(3) That all hauling work shall be performed in accordance with the requirements of Chapter 826-a of the Laws of Westchester County.

(4) That I make this statement in connection with the submission of the foregoing bid as proof of the required hauling license, knowing that this statement will be relied upon by the County in the evaluation of that bid.

Signature

Sworn to before me
this _____ day of _____

License No.

Notary Public - State of New York

COMPLETE THIS FORM USING BLACK INK ONLY

STORMWATER POLLUTION PREVENTION CERTIFICATION

I certify under penalty of law that I understand and agree to comply with the terms and conditions of the Stormwater Pollution Prevention Plan (“SPPP”) for the construction site identified in such SPPP as a condition of authorization to discharge stormwater. I also understand the operator must comply with the terms and conditions of the New York State Pollutant Discharge Elimination System (“SPDES”) general permit for stormwater discharges from construction activities and it is unlawful for any person to contribute to a violation of water quality standards.

Signature

Sworn to before me

This _____ day of _____, 200_.

Notary Public – State of New York, County of _____

My Commission Expires on _____.

This Certification will also have to be signed by your subcontractors. Additional copies of this form can be acquired from the Department of Public Works.

COMPLETE THIS FORM USING BLACK INK ONLY

PREVAILING WAGE RATES AND SUPPLEMENTS

Compliance with the New York State Construction (Article 1, Section 17) and the New York State Labor Law (Section 220)

Is your firm in full compliance with the New York State Labor Law?
(Please check one)

Yes _____ No _____

Are the wage supplements paid into a Federally approved program?
(Please check one)

Yes _____ No _____

If Yes, please indicate which program:

If No, please indicate how the supplements are being paid:

Yes, I have read and understand the terms of this Contract and the laws of this Agreement:

Signature

Date: _____

Notary Public

Date: _____

COMPLETE THIS FORM USING BLACK INK ONLY

MINORITY/WOMEN BUSINESS ENTERPRISE PROGRAM QUESTIONNAIRE
QUESTIONNAIRE REGARDING BUSINESS ENTERPRISES
OWNED AND CONTROLLED BY WOMEN OR PERSONS OF COLOR

As part of the County's program to encourage the meaningful and significant participation of business enterprises owned and controlled by persons of color or women in County contracts, and in furtherance of Section 308.01 of the Laws of Westchester County, completion of this form is required.

A "business enterprise owned and controlled by women or persons of color" means a business enterprise, including a sole proprietorship, limited liability partnership, partnership, limited liability corporation, or corporation, that either:

- 1.) meets the following requirements:
 - a. is at least 51% owned by one or more persons of color or women;
 - b. is an enterprise in which such ownership by persons of color or women is real, substantial and continuing;
 - c. is an enterprise in which such ownership interest by persons of color or women has and exercises the authority to control and operate, independently, the day-to-day business decisions of the enterprise; and
 - d. is an enterprise authorized to do business in this state which is independently owned and operated.

- 2.) is a business enterprise certified as a minority business enterprise ("MBE") or women business enterprise ("WBE") pursuant to Article 15-a of the New York State Executive Law and the implementing regulations, 9 New York Code of Rules and Regulations subtitle N Part 540 et seq., **OR**

- 3.) is a business enterprise certified as a small disadvantaged business concern pursuant to the Small Business Act, 15 U.S.C. 631 et seq., and the relevant provisions of the Code of Federal Regulations as amended.

Please note that the term "persons of color," as used in this form, means a United States citizen or permanent resident alien who is and can demonstrate membership of one of the following groups:

- (a) Black persons having origins in any of the Black African racial groups;
- (b) Hispanic persons of Mexican, Puerto Rican, Dominican, Cuban, Central or South American descent of either Indian or Hispanic origin regardless of race;
- (c) Native American or Alaskan native persons having origins in any of the original peoples of North America; or
- (d) Asian or Pacific Islander persons having origins in any of the Far East countries, South East Asia, the Indian subcontinent or the Pacific Islands.

1. Are you a business enterprise owned and controlled by women or persons of color in accordance with the standards listed above?

_____ No

_____ Yes

Please note: If you answered “yes” based upon certification by New York State and/or the Federal government, official documentation of the certification must be attached.

2. If you answered “Yes” above, please check off below whether your business enterprise is owned and controlled by women, persons of color, or both.

_____ Women

_____ Persons of Color (*please check off below all that apply*)

_____ Black persons having origins in any of the Black African racial groups

_____ Hispanic persons of Mexican, Puerto Rican, Dominican, Cuban, Central or South American descent of either Indian or Hispanic origin regardless of race

_____ Native American or Alaskan native persons having origins in any of the original peoples of North America

_____ Asian or Pacific Islander persons having origins in any of the Far East countries, South East Asia, the Indian sub-continent or the Pacific Islands

Name of Business Enterprise: _____

Address: _____

Name and Title of person completing questionnaire: _____

Signature: _____

Notary Public

Date

CONTRACTOR'S DISCLOSURE STATEMENT

Instructions:

The County of Westchester, in order to insure that it employs responsible contractors for its major construction projects, requires all bidders for construction contracts (which includes reconstruction and repair) with an estimated value of One Hundred Thousand (\$100,000.00) or more Dollars to answer completely and swear to the questions below. If a Contractor Disclosure Statement has been included with this bid specification, then the County has determined that it is applicable to this bid. All subcontractors whose contract has a value of One Hundred Thousand (\$100,000.00) or more Dollars must also submit a Contractor Disclosure Statement.

Please read the questions carefully and answer them completely. Before you answer these questions, please read the definitions of terms used in these questions. While you may contact the Department of Public Works if you have questions about this form, the County cannot provide you with any legal advice for which you must contact your own lawyer. **FAILURE TO COMPLETE THIS CONTRACTOR DISCLOSURE STATEMENT IN GOOD FAITH MAY RESULT IN THE REJECTION OF YOUR BID.**

If you have previously filled out a Contractor Disclosure Statement for another County bid and only some but not all of your responses have changed, attach a copy of the prior Contractor Disclosure Statement and check #2 below indicating changes only and only answer those questions which have changed since you last filled out the Contractor Disclosure Statement.

If you have previously completed a Contractor Disclosure Statement for another County bid and nothing has changed in your responses to the questions, then check #3 and fill out the attached No Change Affidavit. Attach a copy of the prior Contractor Disclosure Statement to the No Change Affidavit.

NOTE IF THE SPACES PROVIDED FOR ANSWERS ARE NOT SUFFICIENT FOR YOU TO COMPLETE YOUR ANSWER TO A PARTICULAR QUESTION, THEN ATTACH ADDITIONAL PAGES TO THIS CONTRACTOR DISCLOSURE STATEMENT WHICH INDICATE THE NUMBER OF THE QUESTION THAT YOU ARE COMPLETING THE ANSWER FOR.

ALSO DO NOT LEAVE ANY ANSWERS BLANK. IF A QUESTION IS NOT APPLICABLE, ANSWER - N/A – AND OFFER A BRIEF EXPLANATION AS TO WHY THE QUESTION DOES NOT APPLY.

Definitions:

Affiliate – is another Business Entity in which the Contractor or one or more of the Principals of the Contractor has an ownership interest of more than fifty (50%) percent. An Affiliate is also another Business Entity in which the Parent of the Contractor owns more than fifty (50%) percent of that other Business Entity.

Agency or Government Agency – is any Federal, State, City or other local agency including, but not limited to, departments, offices, quasi-public agencies, public authorities and

CONTRACTOR'S DISCLOSURE STATEMENT

corporations, boards of education and higher education, public development corporations and local development corporations.

Assignee – is a person or Business Entity to whom an assignment (e.g., a transfer to another of any property, real or personal, including a transfer of any rights in such property) is made.

Business Address – is the location of principal executive offices and is also the primary place of business in Westchester County, if different.

Business Entity – is any profit-seeking business including, but not limited to, corporations, limited and general partnerships, joint ventures and individual (sole) proprietorships.

Contract – is any binding agreement with any Government Agency or other Business Entity for the provision of goods, or services including, but not limited to, construction.

Contractor – is the Business Entity submitting this Contractor Disclosure Statement.

Contractor Disclosure Statement – is this document.

Control – A Business Entity controls another Business Entity when:

- The controlling Business Entity owns more than fifty (50%) percent of the controlled Business Entity, or
- The controlling Business Entity directs or has the right to direct daily operations of the controlled Business Entity, or
- The same person is a Principal in both businesses and directs the daily operations of the controlled Business Entity.

Investigations – is any official inquiry by any Government Agency, with the exception of background investigations for employment.

Officer – is any individual who serves in the function of chief executive officer, chief financial officer or chief operating officer of the Business Entity by whatever titles known.

Parent – is a Business Entity which owns more than fifty (50%) percent of another Business Entity.

Principal – is an individual, partnership, joint venture or corporation which holds ten (10%) percent or more ownership interest in the Business Entity.

Partner – shall mean a person or Business Entity that has a joint ownership in a particular business, but the ownership interest is not as a shareholder of a corporation.

Successor – is a person or Business Entity that takes the place that another has left. With reference to a corporation, a successor shall mean another corporation which, through amalgamation, consolidation, or other legal succession, becomes invested with the rights and assumes the burdens of the first corporation.

CONTRACTOR'S DISCLOSURE STATEMENT

CONTRACT NO.: _____

Check if Subcontractor

Type Of Submission

(Put a X or √ next to the applicable type of submission)

1. **Fully Completed Contractor Disclosure Statement** _____
(Sign Oath on last page of Disclosure Statement)

2. **Changes Only Contractor Disclosure Statement** _____
(Attach copy of previously filed Contractor Disclosure Statement that you are amending. Denote any changes on the following Contractor Disclosure Statement. Sign Oath on last page of this Disclosure Statement)

3. **No Change** _____
(Fill out "No Change Affidavit" [below] and attach copy of previously filed Contractor Disclosure Statement)

NO CHANGE AFFIDAVIT

I swear that the attached Contractor Disclosure Statement was submitted to the County of Westchester on _____ and was true as signed, and that
(Date)
since the above date nothing has occurred which changes in any way the responses made to the questions contained in the attached Contractor Disclosure Statement.

Submitted by: _____
(Signature)

Name (Print): _____

Title (Print): _____

Sworn to before me this ____ day of _____, 200_

NOTARY PUBLIC

COMPLETE THIS FORM USING BLACK INK ONLY

CONTRACTOR'S DISCLOSURE STATEMENT

Questions:

1. The Business Address and taxpayer identification number of Contractor and primary telephone number for such location.

2. List the Business Addresses and primary telephone numbers for such locations, if different from answer to #1 above, where Contractor has been located over the last five (5) years.

3. List all other names and taxpayer identification numbers under which the Contractor, or the Principals and Officers of Contractor, have conducted business within the prior five (5) years.

4. For any response to #3 above, list any and all Westchester County contracts that were awarded to such "other name" Business Entity.

5. List the type of Business Entity that the Contractor is presently organized as (for example - sole proprietorship, partnership, joint venture or corporation).

COMPLETE THIS FORM USING BLACK INK ONLY

CONTRACTOR'S DISCLOSURE STATEMENT

6. If Contractor is a corporation, list the date that the Contractor was incorporated. Also list the name of the Government Agency and location of said Agency in which a certificate of incorporation, certificate of doing business or equivalent, has been filed and the date of any amendments thereto. If, however, the Contractor is a partnership, list the date that the partnership was formed and the name of the Government Agency and location of said Agency in which a business certificate for partnership or equivalent has been filed.

7. List all the names, current Business Addresses and business telephone numbers of the Principals and Officers of the Contractor. If the Contractor is a partnership, list all partners and their business telephone numbers.

8. List the names, current Business Addresses, telephone numbers and taxpayer identification numbers of all Affiliates of the Contractor.

9. List all the names, Business Addresses and telephone numbers of the Principals and Officers of the Affiliates listed in response to #7 above. If the Affiliate is a partnership, list the Business Addresses and business telephone numbers of all partners.

COMPLETE THIS FORM USING BLACK INK ONLY

CONTRACTOR'S DISCLOSURE STATEMENT

14. If you answered yes to #10 above, list the contract sanction history as defined in #12 above for the Controlling Business Entity during the past five (5) years.

15. List any and all prevailing wage or supplement payment violations; state labor law violations deemed willful and any other federal or state citations, notices, violation orders, pending administrative hearings or proceedings or determinations of a violation of any labor law or regulation regarding the Contractor.

16. List all Investigations of the Contractor, its Principals and Officers or, if a partnership, of the Contractor's Partners. Also list all investigations of Affiliates, their Principals and Officers or, if a partnership, of their Partners.

COMPLETE THIS FORM USING BLACK INK ONLY

CONTRACTOR'S DISCLOSURE STATEMENT

17. Have all Federal and State income tax returns, if required, been filed by Contractor during the last five (5) years? ___Yes ___No If you answered no, please explain why such returns were not filed.

18. Are there any criminal proceedings pending against the Contractor or any Principal or Officer of the Contractor or partner, if Contractor is a partnership? ___Yes ___No If you answered yes, please provide details of the pending criminal proceedings.

19. List the record of all criminal convictions of the Contractor, any Principal or Officer or partner, if Contractor is a partnership, and of any former Principal or Officer, of the Contractor or former partner, if Contractor is a partnership, for any crime related to truthfulness or business conduct and for any felony committed within the prior ten (10) years.

20. List all bankruptcy proceedings that the Contractor or its Affiliates have been the subject of within the past seven (7) years, whether pending or completed.

COMPLETE THIS FORM USING BLACK INK ONLY

CONTRACTOR'S DISCLOSURE STATEMENT

21. Is the Contractor a successor, assignee or Affiliate of a Business Entity that has ever been denied a Contract or deemed ineligible to bid on a Government Agency contract?

___ Yes No ___ If you answered yes, explain below.

OATH

I swear that all of the above answers are true based on my knowledge of the facts, or are believed by me to be true, based upon a review of records containing the facts or based upon information I obtained from someone who has knowledge of the facts; and that I have authority to sign this document; and that the answers given above have not been made in a manner intended to deceive or to defeat the purpose of the Contractor Disclosure Statement, which is to assist the County of Westchester in determining if the Contractor is a responsible bidder.

Submitted by: _____
(Signature)

Name (Print): _____

Title (Print): _____

Sworn to before me this ___ day of _____, 20__

NOTARY PUBLIC

COMPLETE THIS FORM USING BLACK INK ONLY

REQUIRED DISCLOSURE OF RELATIONSHIPS TO COUNTY

(Prior to execution of a contract by the County, a potential County contractor must complete, sign and return this form to the County)

Contract Name and/or ID No.:

(To be filled in by County)

Name of Contractor:

(To be filled in by Contractor)

A potential County contractor must complete this form as part of the proposed County contract.

- 1.) Are any of the employees that the Contractor will use to carry out this contract also a County officer or employee, or the spouse, child, or dependent of a County officer or employee?

Yes _____ No _____

If yes, please provide details (attach extra pages, if necessary): _____

- 2.) Are any of the owners of the Contractor or their spouses a County officer or employee?

Yes _____ No _____

If yes, please provide details (attach extra pages, if necessary): _____

- 3.) Do any County officers or employees have an **interest**¹ in the Contractor or in any approved subcontractor that will be used for this contract?

Yes _____ No _____

If yes, please provide details (attach extra pages, if necessary): _____

By signing below, I hereby certify that I am authorized to complete this form for the Contractor.

Name: _____

Title: _____

Date: _____

¹ "Interest" means a direct or indirect pecuniary or material benefit accruing to a County officer or employee, his/her spouse, child or dependent, whether as the result of a contract with the County or otherwise. For the purpose of this form, a County officer or employee shall be deemed to have an "interest" in the contract of:

- 1.) His/her spouse, children and dependents, except a contract of employment with the County;
- 2.) A firm, partnership or association of which such officer or employee is a member or employee;
- 3.) A corporation of which such officer or employee is an officer, director or employee; and
- 4.) A corporation of which more than five (5) percent of the outstanding capital stock is owned by any of the aforesaid parties.

QUESTIONNAIRE REGARDING BUSINESS ENTERPRISES
OWNED AND CONTROLLED BY
SERVICE-DISABLED VETERANS

The County believes it is a laudable goal to provide business opportunities to veterans who were disabled while serving our country, and wants to encourage the participation in County contracts of certified business enterprises owned and controlled by service-disabled veterans. As part of the County's program to encourage the participation of such business enterprises in County contracts, and in furtherance of Article 17-B of the New York State Executive Law, we request that you answer the questions listed below.

The term "Certified Service-Disabled Veteran-Owned Business" shall mean a business that is a certified service-disabled veteran-owned business enterprise under the New York State Service-Disabled Veteran-Owned Business Act (Article 17-B of the Executive Law).

1. Are you a business enterprise that is owned and controlled by a service-disabled veteran in accordance with the standards listed above?

_____ No
_____ Yes

2. Are you certified with the State of New York as a Certified Service-Disabled Veteran-Owned Business?

_____ No
_____ Yes

3. If you are certified with the State of New York as a Certified Service-Disabled Veteran-Owned Business, please attach a copy of the certification.

Name of Firm/Business Enterprise: _____

Address: _____

Name/Title of Person completing Questionnaire: _____

Signature: _____

STATE OF NEW YORK)
) ss.:
COUNTY OF)

Notary Public

Date:

SCHEDULE "F"
CRIMINAL BACKGROUND DISCLOSURE
INSTRUCTIONS

Pursuant to Executive Order 1-2008, the County is required to maintain a record of criminal background disclosure from all persons providing work or services in connection with any County contract, including leases of County-owned real property and licenses:

- a.) If any of the persons providing work or services to the County in relation to a County contract are not subject to constant monitoring by County staff while performing tasks and/or while such persons are present on County property pursuant to the County contract; and
- b.) If any of the persons providing work or services to the County in relation to a County contract may, in the course of providing those services, have access to sensitive data (for example SSNs and other personal/secure data); facilities (secure facilities and/or communication equipment); and/or vulnerable populations (for example, children, seniors, and the infirm).

In those situations, the persons who must provide a criminal background disclosure ("Persons Subject to Disclosure") include the following:

- a.) Consultants, Contractors, Licensees, Lessees of County-owned real property, their principals, agents, employees, volunteers or any other person acting on behalf of said Contractor, Consultant, Licensee, or Lessee who is at least sixteen (16) years old, including but not limited to Subconsultants, subcontractors, Sublessess, or Sublicensees who are providing services to the County, and
- b.) Any family member or other person, who is at least sixteen (16) years old, residing in the household of a County employee who lives in housing provided by the County located on County property.

Under Executive Order 1-2008, it is the duty of every County Consultant, Contractor, Licensee, or Lessee to inquire of each and every Person Subject to Disclosure and disclose whether they have been convicted of a crime or whether they are subject to pending criminal charges, and to submit this form with that information.¹ Accordingly, you are required to complete the attached Criminal Background Disclosure Form and Certification.

Please note that under no circumstances shall the existence of a language barrier serve as a basis for the waiver of or an exception from the disclosure requirements of Executive Order 1-2008. If translation services are required by the Consultant, Contractor, Licensee, or Lessee to fulfill this obligation, it shall be at the sole cost and expense of the Consultant, Contractor, Licensee, or Lessee.

Please also note that the conviction of a crime(s) and/or being subject to a pending criminal charge(s) will not automatically result in a denial of a person's right to work on a County contract, right to be on County property, or license, but may, if the County determines that the prior conviction(s) or pending criminal charge(s) create an unacceptable risk. However, if a person fails to list or falsifies any part of his/her conviction history or any pending criminal charge(s) for any reason, he/she may be prohibited from working or being on County property without any risk assessment. If it is later determined that a Person Subject to Disclosure failed to disclose a criminal conviction or pending criminal charge for any reason, his/her right to work on a County contract, be on County property, or license may be terminated at any time.

Please further note that, pursuant to Executive Order 1-2008, and subject to the applicable provisions of New York Correction Law §§ 752 and 753, the County has the right to bar a Person Subject to Disclosure from providing work or services to the County or from being on County property if any such person has:

- a.) A conviction of a crime(s);
- b.) A pending criminal proceeding for a crime(s); or
- c.) Refused to answer questions concerning his/her criminal background

¹ For these disclosures, a "crime" or "pending criminal charge" includes all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State.

Please finally note that any failure by a County Consultant, Contractor, Licensee, or Lessee to comply with the disclosure requirements of Executive Order 1-2008 may be considered by the County to be a material breach and shall be grounds for immediate termination by the County of the related County contract.

Exemptions

Executive Order 1-2008 exempts from the aforementioned disclosure requirements Persons Subject to Disclosure:

- a.) for whom the County has already conducted a background check and issued a security clearance that is in full force and effect; and
- b.) for whom another state or federal agency having appropriate jurisdiction has conducted a security and/or background clearance or has implemented other protocols or criteria for this purpose that apply to the subject matter of a County contract that is in full force and effect.

If you are claiming an exemption for one or more Persons Subject to Disclosure, you must notify the Procuring Officer². The Procuring Officer will then determine whether the Person(s) Subject to Disclosure are actually exempt, and provide written notification of his/her determination. If the Procuring Officer determines that a Person Subject to Disclosure is not exempt, the Procuring Officer will notify you of that determination, and you will have to include disclosures for that person on your Criminal Background Disclosure Form and Certification.

² Procuring Officer” shall mean the head of the department or the individual or individuals authorized by the head(s) of the department(s) undertaking the procurement and with respect to those matters delegated to the Bureau of Purchase and Supply pursuant to Section 161.11(a) of the Laws of Westchester County, the Purchasing Agent.

Subconsultants, Subcontractors, Sublessees, or Sublicensees

Under Executive Order 1-2008, it is your duty to ensure that any and all approved subconsultants, subcontractors, sublessees, or sublicensees complete and submit the attached Criminal Background Disclosure Form and Certification for all of their respective Persons Subject to Disclosure. This must be done before such a subconsultant, subcontractor, sublessees, or sublicensees can be approved to perform work on a contract.

New Persons Subject to Disclosure

Under Executive Order 1-2008, you have a **CONTINUING OBLIGATION** to maintain the accuracy of the Criminal Background Disclosure Form and Certification (and any accompanying documentation) for the duration of this contract, including any amendments or extensions thereto. Accordingly, it is your duty to complete and submit an updated Criminal Background Disclosure Form and Certification whenever there is a new Person Subject to Disclosure for this contract. **NO NEW PERSON SUBJECT TO DISCLOSURE SHALL PERFORM WORK OR SERVICES OR ENTER ONTO COUNTY PREMISES UNTIL THE UPDATED CRIMINAL BACKGROUND DISCLOSURE FORM AND CERTIFICATION IS FILED WITH THE PROCURING OFFICER.** You shall also provide the County with any other updates that may be necessary to comply with the disclosures required by Executive Order 1-2008.

*PLEASE CONTINUE TO THE
Criminal Background Disclosure Form and Certification
BEGINNING ON THE NEXT PAGE*

CONTRACT #:

Name of Consultant, Contractor, Lessee, or Licensee: _____

**CRIMINAL BACKGROUND DISCLOSURE
FORM AND CERTIFICATION**

If this form is being completed by a subconsultant, subcontractor, sublessee, or sublicensee, please consider all references in this form to “consultant, contractor, lessee, or licensee” to mean “subconsultant, subcontractor, sublessee, or sublicensee” and check here: _____

I, _____, certify that I am a principal or a
(Name of Person Signing Below)

representative of the Consultant, Contractor, Lessee, or Licensee and I am authorized to complete and execute this Criminal Background Disclosure Form and Certification. I certify that I have asked each Person Subject to Disclosure the following questions:

- **Have you or your company ever been convicted of a crime (all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State) including, but not limited to, conviction for commission of fraud, embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements or receiving stolen property?**
- **Are you or your company subject to any pending criminal charges (all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State)?**

I certify that the names and titles of Persons Subject to Disclosure who refused to answer **either** of the questions above are:

1. _____
2. _____
3. _____
4. _____
5. _____

(If more space is needed, please attach separate pages labeled “REFUSED to Answer - Continued.”)

I certify that the names and titles of Persons Subject to Disclosure who answered “Yes” to **either of the** questions above are:

1. _____
2. _____
3. _____
4. _____
5. _____

(If more space is needed, please attach separate pages labeled “YES Answers - Continued.”)

Each Person Subject to Disclosure listed above who has either **been convicted of a crime(s)** and/or **is subject to a pending criminal charge(s)** must answer additional questions. Those questions are below.

A Person Subject to Disclosure who has **been convicted of a crime(s)** must respond to the following (please attach separate pages with responses for each person, with their name and title):

- 1.) Describe the reason for being on County property if applicable, identify the specific duties and responsibilities on this project which you intend to perform for the County, including but not limited to, access to sensitive data and facilities and access to vulnerable populations.
- 2.) Please list all criminal convictions along with a brief description of the crime(s) (including all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State).
- 3.) Please provide the date and place of each conviction.
- 4.) Please provide your age at the time of each crime for which you were convicted.
- 5.) Please provide the legal disposition of each case.
- 6.) Please provide any information either produced by yourself or someone on your behalf in regards to your rehabilitation and good conduct.

A Person Subject to Disclosure who **is subject to a pending criminal charge(s)** must respond to the following (please attach separate pages with responses for each person, with their name and title):

- 1.) Describe the reason for being on County property and if applicable, identify the specific duties and responsibilities on this project which you intend to perform for the County, including but not limited to, access to sensitive data and facilities and access to vulnerable populations.
- 2.) Please identify all pending criminal charges (all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State).
- 3.) Please briefly describe the nature of the pending charges and the date upon which it is alleged that a crime was committed.

I hereby certify that all of the information provided herein (and in any and all attachments) is true and accurate and that all disclosures required by Executive Order 1-2008 and this Criminal Background Disclosure Form and Certification have been completed. By my signature below, I hereby affirm that all of the facts, statements and answers contained herein (and in any and all attachments) are true and correct. I understand that providing false or incomplete information or withholding by omission or intention pertinent information will be cause for refusing further consideration of my being utilized under this contract.

It is understood and agreed that no Person Subject to Disclosure shall perform work or services or enter onto County property until this required Criminal Background Disclosure Form and Certification is filed with the Procuring Officer.

It is understood and agreed that to the extent that new Persons Subject to Disclosure are proposed to perform work or provide services under this contract after filing of this Criminal Background Disclosure Form and Certification with the Procuring Officer, such new Persons Subject to Disclosure shall not perform work or provide services or enter into County property until an updated Criminal Background Disclosure Form and Certification has been filed with the Procuring Officer.

It is further understood and agreed that the consultant, contractor, lessee, or licensee has a continuing obligation to maintain the accuracy of the Criminal Background Disclosure Form and Certification for the duration of this contract, including any amendments or extensions thereto, and shall provide any updates to the information to the County as necessary to comply with the requirements of Executive Order 1-2008.

Name: _____

Title: _____

Date: _____

Notary Public

Date

SUBCONTRACTOR'S SEALED BID SUBMISSION

Westchester County Contract No.: _____

Name of Subcontractor: _____

Address: _____

Phone #: _____ Fax #: _____

E-mail address: _____

Name of Contractor to whom
this bid is submitted: _____

Scope of Work to be performed by Subcontractor (e.g., electrical, plumbing, HVAC):

The price agreed upon by and between Contractor and Subcontractor for the full
performance of the Subcontractor's work:

\$: _____

In words (e.g, one hundred thousand dollars and xx/100):

Subcontractor

Contractor

Signature

Signature

By _____
(print name & title)

By _____
(print name & title)

**THE SUCCESSFUL LOW BIDDER, BEFORE AWARD OF THE CONTRACT, MUST
PROCURE AND PROVIDE TO THE COUNTY, FROM EACH OF THE ABOVE
DENOTED SUBCONTRACTORS, A CONTRACT DISCLOSURE STATEMENT
(PROPOSAL PAGES 24-32) AND THE REQUIRED DISCLOSURE OF
RELATIONSHIPS TO COUNTY (PROPOSAL PAGES 33-34)**

COMPLETE THIS FORM USING BLACK INK ONLY

INFORMATION FOR BIDDERS



2. INFORMATION FOR BIDDERS

DEPARTMENT OF PUBLIC WORKS

Division of Engineering

INFORMATION FOR BIDDERS

1. ADDENDA AND INTERPRETATION

No interpretation of the meaning of the plans, specifications or other contract documents will be made to any bidder orally. Every request for such interpretation should be in writing addressed to the Westchester County Department of Public Works, Division of Engineering, Room 512, Michaelian Office Building, White Plains, New York, and to be given consideration must be received at least five (5) days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be posted on the internet not later than three (3) days prior to the date fixed for the opening of bids. Revisions to plans or drawings requiring the issuance of additional or revised drawings will be noted on the internet with instructions how to acquire copies of such revised plans or drawings. Failure of any bidder to receive any such addendum or interpretation or any other form, instrument or document shall not relieve any bidder from any obligation under its bid as submitted. All addenda so issued shall become part of the contract documents.

A bidder's failure to request a clarification, interpretation, etc. of any portion of the plans, specifications, or contract or to point out any inconsistency therein will preclude such bidder from thereafter claiming any ambiguity, inconsistency, or error which should have been discovered by a reasonably prudent bidder and from asserting any claim for damages arising directly or indirectly therefrom.

2. VOIDED CLAUSES

Wherever in this booklet any page is stamped "VOID", only the section(s) or paragraph(s) so stamped are void. All other sections(s) and paragraph(s) remain in full force and effect.

3. PRE-BID SITE INSPECTION

Unless otherwise stated, on building construction work, bidders are free and encouraged to examine the work site during normal work hours preceding the date on which bids are to be opened. For those bidders requesting further clarification of the conditions, an appointment with the County's representative, on the eighth day (Tuesday) prior to the bid opening date, can be requested, by contacting the, Department of Public Works, Division of Engineering at (914) 995-2553.

Each bidder must inform itself fully of the conditions relating to the work to be performed. Failure to do so will not relieve a successful bidder of the obligation to furnish all material and labor necessary to carry out the provisions of the contract documents and to complete the contemplated work for the consideration set forth in its Bid.

At the time of the opening of bids each bidder will be presumed to have inspected the sites and to have read and to be thoroughly familiar with the Plans and Contract Documents (including all addenda).

4. BID SECURITY

Bid Security shall be provided in accordance with the "Notice to Contractors." Where

INFORMATION FOR BIDDERS

a Performance and Payment bond is required in the Notice to Contractors, the executed “Bid Bond and Consent of Surety” of the Proposal Pages must be submitted with the Bid when the bid is more than \$100,000. The successful bidder, no matter the size of its bid, will be required to furnish a Performance and Payment Bond.

Where a Performance and Payment Bond is not specified in the Notice to Contractors, then the required Security may be furnished in the form of a Certified Check; drawn to the order of “County of Westchester, clipped to the top of the front cover and submitted with the Bid.

Certified checks submitted will be returned to all bidders submitting certified checks within three (3) days after the opening of bids unless the bidder or bidders submitting certified checks are among the two lowest bidders. At any time after the opening of bids, the second lowest bidder, if the second lowest bidder has submitted a certified check, may substitute a bid bond for the certified check by presenting the bond to the Secretary of the Board of Acquisition and Contract. This bond shall be in the form and coverage required by the County and shall be in an amount not less than the amount of the bidder's certified check. After receipt, approval and acceptance of the bond by the County, the County will forward to the bidder a County check in an amount equal to the bidder's certified check.

All certified checks submitted will be returned to the two lowest bidders within 48 hours after the successful bidder executes the required contract and furnishes the County with all necessary bonds and insurance certificates.

In the event that the successful bidder has not executed the required contract and furnished the required bonds and insurance certificates within forty-five (45) days after the opening of bids, the County, upon demand from a bidder (except for the successful bidder), will send a County check to the bidder in the amount of the bidder's certified check.

Failure of the successful bidder to execute the contract and furnish the necessary bonds and insurance certificates shall result in forfeiture of the bid security, such sum to be retained by the County as liquidated damages.

5. PERFORMANCE AND PAYMENT BOND

If required pursuant to "Notice to Contractors."

If a Performance and Payment bond is required in accordance with the “Notice to Contractors”, the “Bid Bond and Consent of Surety” of the Proposal Pages must be executed by the Contractor’s Surety Company and submitted with the Bid for all bids over \$100,000.

Simultaneously with its delivery of the executed contract, the successful bidder shall deliver to the County an executed bond in the amount of one hundred percent of the accepted bid as security for the faithful performance of its contract and in the amount of one hundred percent for the payment of all persons performing labor or furnishing materials in connection therewith, prepared in satisfactory form and having as surety thereon such bond underwriter or surety that appears on the U.S. Treasury’s listing of approved sureties (Department Circular 570), and is licensed to transact business in New York State. In the event such Surety ceases to appear on the U.S. Treasury’s listing of approved sureties (Department Circular 570) or ceases to be licensed to transact business in New York State or becomes insolvent or enters liquidation proceedings, the Contractor, at its sole cost, shall furnish a replacement bond from a surety satisfactory to the County.

INFORMATION FOR BIDDERS

The form of contract and Performance and Payment Bond to be used in connection with this Contract and to become a part of the contract documents is attached in the section entitled "Sample Contract and Bond for Construction".

6. INDEMNIFICATION AGREEMENT

The Contractor agrees:

- A. that except for the amount, if any, of damage contributed to, caused by or resulting from the negligence of the County, the Contractor agrees to indemnify and hold harmless the County of Westchester, its officers, employees, elected officials, and agents from and against any and all liability, damage, claims, demands, costs, judgments, fees, attorneys' fees or loss arising directly or indirectly out of the performance or failure to perform hereunder by the Contractor or third parties under the direction or control of the Contractor; and
- B. to provide defense for and defend, at its sole expense, any and all claims, demands or causes of action directly or indirectly arising out of the Agreement and to bear all other costs and expenses related thereto.

7. INSURANCE REQUIREMENTS

The Contractor, upon award of the contract and throughout the term of the Agreement, shall obtain at its own cost and expense the required insurance as delineated below from insurance companies licensed in the State of New York, carrying a Best's financial rating of A or better. Contractor shall provide evidence of such insurance to the County of Westchester ("County"), either by providing a copy of policies and/or certificates as may be required and approved by the Director of Risk Management of the County ("Director"). The policies or certificates thereof shall provide that ten (10) days prior to cancellation or material change in the policy, notices of same shall be given to the Board of Acquisition and Contract of the County of Westchester by registered mail, return receipt requested, for all of the following stated insurance policies, with a copy also sent to the Director of Risk Management of the County. All notices shall name the Contractor and identify the Contract Number.

If at any time any of the policies required herein shall be or become unsatisfactory to the Director, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Director, the Contractor shall upon notice to that effect from the County, promptly obtain a new policy, and submit the policy or the certificate as requested by the Director to the Office of Risk Management of the County for approval by the Director. Upon failure of the Contractor to furnish, deliver and maintain such insurance, the Agreement, at the election of the County, may be declared suspended, discontinued or terminated.

Failure of the Contractor to take out, maintain, or the taking out or maintenance of any required insurance, shall not relieve the Contractor from any liability under the Agreement, nor shall the insurance requirements be construed to conflict with or otherwise limit the contractual obligations of the Contractor concerning indemnification.

All property losses shall be made payable to the "County of Westchester" and adjusted with the appropriate County personnel.

In the event that claims, for which the County may be liable, in excess of the insured amounts provided herein are filed by reason of Contractor's negligent acts or omissions under the

INFORMATION FOR BIDDERS

agreement or by virtue of the provisions of the labor law or other statute or any other reason, the amount of excess of such claims or any portion thereof, may be withheld from payment due or to become due the Contractor until such time as the Contractor shall furnish such additional security covering such claims in form satisfactory to the Director.

In the event of any loss, if the Contractor maintains broader coverage and/or higher limits than the minimums identified herein, the County shall be entitled to the broader coverage and/or higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the County.

The Contractor shall provide proof of the following coverage. (Other coverage may be required by the County of Westchester based on specific needs. If such other coverages are required for a specific contract, those coverages will be described in the "Special Clauses" of the contract specifications):

- a) Workers' Compensation and Employer's Liability. Certificate form C-105.2 or State Fund Insurance Company form U-26.3 is required for proof of compliance with the New York State Workers' Compensation Law. State Workers' Compensation Board form DB-120.1 is required for proof of compliance with the New York State Disability Benefits Law. Location of operation shall be "All locations in Westchester County, New York."

Where an applicant claims to not be required to carry either a Workers' Compensation Policy or Disability Benefits Policy, or both, the employer must complete NYS form CE-200, available to download at: <http://www.wcb.ny.gov>.

If the employer is self-insured for Workers' Compensation, he/she should present a certificate from the New York State Worker's Compensation Board evidencing that fact (Either SI-12, Certificate of Workers' Compensation Self-Insurance, or GSI-105.2, Certificate of Participation in Workers' Compensation Group Self-Insurance).

- b) Commercial General Liability Insurance with a combined single limit of \$1,000,000 (c.s.1) per occurrence and a \$2,000,000 aggregate limit naming the "County of Westchester" as an additional insured on a primary and non-contributory basis. This insurance shall include the following coverages:
 - i. Premises - Operations.
 - ii. Broad Form Contractual.
 - iii. Independent Contractor and Sub-Contractor.
 - iv. Products and Completed Operations.

NOTE: Additional insured status shall be provided by standard or other endorsement that extends coverage to the County of Westchester for both on-going and completed operations.

All Contracts involving the use of explosives, demolition and/or underground work shall provide proof that XCU is covered.

- c) Commercial Umbrella/Excess Insurance: \$2,000,000 each Occurrence and Aggregate naming the "County of Westchester" as additional insured, written on a "follow the form" basis.
- d) Owners Protective Liability Policy naming the County as insured, with a minimum limit of liability per occurrence of \$3,000,000 (where applicable, or as determined by the Director, Risk Management)
- e) Automobile Liability Insurance with a minimum limit of liability per occurrence of \$1,000,000 for bodily injury and a minimum limit of \$100,000 per occurrence for property damage or a

INFORMATION FOR BIDDERS

combined single limit of \$1,000,000 unless otherwise indicated in the contract specifications. This insurance shall include for bodily injury and property damage the following coverages and name the "County of Westchester" as additional insured:

- i. Owned automobiles.
 - ii. Hired automobiles.
 - iii. Non-owned automobiles.
- f) Construction Insurance: For the construction, renovation or repair of bridges, viaducts or similar structures, the Contractor at its own cost and expense shall provide and maintain a "Bridge Builder's Risk Form, All Risk Insurance Contract," with flat premium endorsement, until the construction contract is accepted by the Board of Acquisition and Contract of the County of Westchester. The coverage shall be written for 100% of the completed value, covering the Contractor and County of Westchester as the insureds. The Contractor shall provide the original and duplicate policy to the County (unless the County shall accept, in lieu thereof, all contained endorsements including all applicable provisions and coverages).

For the construction of (a) new buildings and (b) for additions or repairs of existing buildings or structures, the Contractor at its own cost and expense shall provide and maintain a "Builder's Risk Form, All Risk Insurance Contract," with flat premium endorsement, until the construction contract is accepted by the Board of Acquisition and Contract of the County of Westchester. The coverage shall be written for 100% of the completed value, covering the Contractor and County of Westchester as the insureds. The Contractor shall provide the original and duplicate policy to the County (unless the County shall accept, in lieu thereof, all contained endorsements including all applicable provisions and coverages).

- g) With regard to the insurance coverage provided for in Section 7, subsections b), c) and e) above, in addition to naming the "County of Westchester" as an additional insured, the Contractor shall also name "Standard Amusements LLC" as an additional insured with regard to any contract, work or project to be performed at Playland Park in Rye, New York, on the same terms and conditions as provided for the benefit of the County of Westchester.

All policies of the Contractor shall be endorsed to contain the following clauses:

(a) Insurers shall have no right to recovery or subrogation against the County (including its employees and other agents and agencies), it being the intention of the parties that the insurance policies so effected shall protect both parties and be primary coverage for any and all losses covered by the above-described insurance.

(b) The clause "other insurance provisions" in a policy in which the County is named as an insured, shall not apply to the County.

(c) The insurance companies issuing the policy or policies shall have no recourse against the County (including its agents and agencies as aforesaid) for payment of any premiums or for assessments under any form of policy.

(d) Any and all deductibles in the above described insurance policies shall be assumed by and be for the account of, and at the sole risk of, the Contractor.

INFORMATION FOR BIDDERS

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8. PREVAILING WAGE RATES AND SUPPLEMENTS

A. Wages to be Paid and Supplements to be Provided

Each laborer, workman or mechanic employed by the Contractor(s), Sub-contractor(s) or other person(s) doing or contracting to do the whole or part of the work contemplated by this Contract, shall be paid the prevailing wages and provide the supplements (including but not limited to health, welfare and pension benefits) as required by Article 8 (Section 220-223) and Article 9 (230-239) of the New York State Labor Law.

INFORMATION FOR BIDDERS

B. Schedule of Hourly Rates/Supplements

The "Schedule of Hourly Rates and Supplements" shows the prevailing hourly rates of wages to be paid and supplements to be provided. It is the County's preference that such supplements shall be paid to a Federally qualified Pension, Health and Welfare program and New York State Registered Apprentice Training Program.

Classifications not appearing on the rate sheet can be used only with the consent of the Commissioner of Public Works and then the rate to be paid will be given by the Commissioner of Public Works after advising with the State Department of Labor.

C. Grounds for Cancellation of Contract

In the event of a failure, to pay the prevailing wages and provide the supplements in accordance with the New York State Labor Law, and as described in this Contract, it shall be considered a material breach. For the breach or violation of this provision, without limiting any other rights or remedies to which the County or any individual may be entitled or any civil or criminal penalty for which any violator may be liable, the County shall have the right, in its discretion, to terminate this agreement immediately upon notice. In such event, the Contractor(s), Sub-Contractor(s), et al shall be liable to the County for any additional costs incurred by the County in the completion of the project.

In addition to any other remedies available to the County and irrespective of any applicable penalties pursuant to law, the County may deduct from the amount payable to the Contractor under this contract five hundred (\$500.00) dollars as reimbursement for the costs it incurs in investigating any violation of Section 220 of the Labor Law.

D. Records to be kept on Site

The Contractor(s), Sub-contractor(s), et al. shall certify their payrolls and keep them on site and available, in addition to the following informative records:

- 1) Record of hours worked by each workman, laborer and mechanic on each day;
- 2) Record of days worked each week by each workman, laborer and mechanic;
- 3) Schedule of occupation or occupations at which each workman, laborer and mechanic on the project is employed during each work day and week;
- 4) Schedule of hourly wage rates paid to each workman, laborer and mechanic for each occupation.
- 5) A statement or declaration signed by each workman, laborer and mechanic attesting that they have been provided with a written notice, informing them of the prevailing wage rates and supplements requirement for this contract.

E. Responsibility of the Contractor, Sub-Contractor, et al.

The Contractor(s), Sub-Contractor(s), et al. will display the posters in a conspicuous location at the site and distribute the wallet cards to the employees. These posters and wallet cards will inform the employees that they are entitled to receive the prevailing wages and supplements as determined by the Department of Labor and will list the

INFORMATION FOR BIDDERS

Department of Labor's Public Work field offices, with phone numbers for individuals to call if they believe their rights are being violated.

F. Pay for a Legal Day's Work & Use of Apprentices

The wages to be paid for a legal day's work, as hereinbefore defined, to laborers, workmen or mechanics upon such public works, shall be not less than the prevailing rate of wages as hereinafter defined. Serving laborers, helpers, assistants and apprentices shall not be classified as common labor and shall be paid not less than the prevailing rate of wages as hereinafter defined. No employee shall be deemed to be an apprentice unless he is individually registered in an apprenticeship program which is duly registered with the Industrial Commissioner in conformity with the provision of Article 23 of the Labor Law. The wages to be paid for a legal day's work, as hereinbefore defined, to laborers, workmen or mechanics upon any material to be used upon or in connection therewith shall be not less than the prevailing rate for a day's work in the same trade or occupation in the locality within the state where such public work on, about or in connection with which such labor is performed in its final or completed form is to be situated, erected or used and shall be paid in cash; provided, however, that an employer may pay his employees by check upon a Certificate of the Industrial Commissioner to be issued only after a hearing upon the application to pay by check, which hearing shall be with notice of at least five days to be served personally or by mail on all interested persons, or if not served as aforesaid, then to be published in a manner directed by the Industrial Commissioner, which shall afford interested persons the opportunity to appear and to be heard at such hearing, and after proof has been furnished satisfactorily to the Industrial Commissioner of the employer's financial responsibility and the employer gives assurance that such checks may be cashed by employees without difficulty and for the full amount for which they are drawn. Such Contracts shall contain a provision that each laborer, workman or mechanic, employed by such Contractor, Subcontractor or other person about or upon such public works, shall be paid the wages herein provided.

G. Fiscal Officer's Duty to Determine Schedule of Wages

It shall be the duty of the fiscal officer (the "New York State Commissioner of Labor"), to ascertain and determine the schedule of wages to be paid workmen, laborers and mechanics on each such public work, prior to the time of the advertisement for bids, and such schedule of wages shall be annexed to and form a part of the specifications for the work. Such fiscal officer shall file with the department having jurisdiction such schedule of wages to the time of the commencement of the advertisement for bids on all public works proposed to be constructed. The term "Contract" as used in this subdivision also shall include reconstruction and repair of any such public work.

Where Contracts are not awarded within ninety days of the date of the establishment of the prevailing rate of wages by the fiscal officer, the department of jurisdiction shall request of the fiscal officer a redetermination of a schedule of wages.

H. Penalty for Payment of Less than Prevailing Wages

Any person or corporation that willfully pays after entering into such Contract, less than such stipulated wage scale as established by the fiscal officer shall be guilty of a

INFORMATION FOR BIDDERS

misdemeanor and upon conviction shall be punished for such first offense by a fine of five hundred dollars or by imprisonment for not more than thirty days, or both fine and imprisonment; for a second offense by a fine of one thousand dollars, and in addition thereto the Contract on which the violation has occurred shall be forfeited and no such person or corporation shall be entitled to receive any sum nor shall any officer, agent, or employee of the state, municipal corporation or commission or board appointed pursuant to law pay the same or authorize its payment from the funds under his charge or control to any person or corporation for work done upon any Contract, on which the Contractor has been convicted for a second offense in violation of the provisions of this section.

9. LABOR AND COMPLIANCE WITH LABOR LAW

A. Preference for Westchester Residents

The Contractor agrees that in the performance of the work under this Contract he will give preference, and so far as legally possible, to employ citizens and residents of Westchester County.

B. Certifications To Be Filed

It is agreed that, in accordance with Section 220-d of the Labor Law as amended before final payment by or on behalf of the County for any sum due on account of a Contract for a public improvement, the Contractor and each and every Subcontractor of the Contractor or a Subcontractor is required to file a statement in writing in form satisfactory to the Commissioner of Finance certifying to the amounts then due and owing from such Contractor or Subcontractor filing such statement to or on behalf of any and all laborers for daily or weekly wages or supplements on account of labor performed upon the work under the Contract, setting forth therein the names of the persons whose wages or supplements are unpaid and the amount due to each or on behalf of each respectively, which statement so to be filed shall be verified by the oath of the Contractor or Subcontractor as the case may be that he has read such statement subscribed by him and knows the contents thereof, and that the same is true to his own knowledge.

C. Retention of Funds

It is further agreed that in accordance with Section 220b of the Labor Law, as amended:

- 1) In case any interested person shall have previously filed a protest in writing objecting to the payment to any Contractor or Subcontractor to the extent of the amount or amounts due or become due to him/her for daily or weekly wages or supplements for labor performed on the public improvement for which such Contract was entered into, or if for any other reason it may be deemed advisable, the Commissioner of Finance may deduct from the whole amount of any payment on account thereof the sum or sums admitted by any Contractor or Subcontractor in such statement or statements so filed to be due and owing by him on account of labor performed on such public improvement before making payment of the amount certified for payment in any estimate or voucher, and may withhold the amount so deducted for the benefit of the laborers, workmen or mechanics whose

INFORMATION FOR BIDDERS

wages or supplements are unpaid or not provided, as the case may be, as shown by the verified statements filed by any Contractor or Subcontractor, and may pay directly to any person the amount or amounts shown to be due to him or his duly authorized collective bargaining labor organization, as the case may be, for such wages or supplements by the statements filed as hereinbefore required, thereby discharging the obligation of the Contractor or Subcontractor to the person or his duly authorized collective bargaining labor organization receiving such payment to the extent of the amount thereof, or

- 2) When any interested person shall file a written complaint with the fiscal officer as defined in section 220-b of the Labor Law, alleging unpaid wages or supplements due for labor performed on a public improvement for which a Contract has been entered into, and said labor is alleged to have been performed within the two year period immediately preceding the date of the filing of said complaint, or if, on the fiscal officer's own initiative, unpaid wages or supplements appear to be due, the fiscal officer shall immediately so notify the financial officer of the civil division interested, or, if there are insufficient moneys still due to the Contractor or Subcontractor to satisfy said wages and supplements, including interest and penalty, the financial officer of another civil division which has entered or subsequently enters into a public improvement contract with the Contractor or Subcontractor, who shall withhold from any payment due or earned by the Contractor or Subcontractor executing said public improvement, sufficient moneys to satisfy said wages and supplements, including interest at the rate provided herein, and any civil penalty that may be assessed as provided herein, pending a final determination. The Commissioner of Finance shall immediately confirm in writing to the fiscal officer the amount of money withheld.
- 3) Moneys withheld pursuant to this section shall be held by the Commissioner of Finance for the sole and exclusive benefit of the workers employed on said public improvement and for payment of any civil penalty that may be assessed as provided herein and shall not be used for any other purpose except upon court order. Any person, partnership, association, corporation or governmental body who files a lien or commences a judicial proceeding with respect to any moneys withheld pursuant to this section shall notify the fiscal officer in writing of the lien or claim on or before the date of filing of the lien or commencement of the judicial proceeding. In any proceeding to obtain moneys withheld pursuant to this section by any person, partnership, association, corporation or governmental body, the Commissioner of Labor shall have the right to appear and be heard.
- 4) The fiscal officer shall then cause an investigation to be made to determine whether any amounts are due to the laborers, workmen or mechanics, or on their respective behalves, on such public improvement, for labor performed after the commencement of the three-year period immediately preceding the filing of the complaint or the commencement of the investigation on his own initiative, as the case may be, and shall order a hearing therein at a time and place to be specified and shall give notice thereof, together with a copy of such complaint, or a statement of the facts disclosed upon such investigation, which notice shall be served personally or by mail on all interested persons, including the person complained

INFORMATION FOR BIDDERS

against and upon the financial officer of the civil division; such person complained against shall have an opportunity to be heard in respect to the matters complained of, at the time and place specified in such notice, which time shall be not less than five days from the service of said notice. The fiscal officer in such an investigation shall be deemed to be acting in a judicial capacity and shall have the rights to issue subpoenas, administer oaths and examine witnesses. The enforcement of a subpoena issued under this section shall be regulated by the Civil Practice Law and Rules. Such investigation and hearing shall be expeditiously conducted, and upon such hearing and investigation, the fiscal officer shall determine the issues raised thereon and shall make and file an order in his office stating such determination and forthwith serve a copy of such order, either personally or by mail, together with notice of filing, upon the parties to such proceedings, and if the fiscal officer be the Comptroller, upon the Commissioner of the Department of Labor. Such order shall direct payment of wages or supplements found to be due, including interest at the rate of interest then in effect as prescribed by the Superintendent of Banks pursuant to Section fourteen (a) of the Banking law per annum from the date of the underpayment to the date of payment.

- 5) In addition to directing payment of wages or supplements, including interest found to be due, the order of the fiscal officer may direct payment of a further sum as a civil penalty in an amount not exceeding twenty-five percent of the total amount found to be due. In assessing the amount of the penalty, due consideration shall be given to the size of the employer's business, the good faith of the employer, the gravity of the violation, the history of previous violations of the employer or any successor or substantially-owned affiliated entity or any of the partners if the Contractor or Subcontractor is a partnership or any of the five largest shareholders of the Contractor or Subcontractor, as determined by the fiscal officer, and any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article, and the failure to comply with record keeping or other non-wage requirements. Upon the fiscal officer's determination of the penalty, where the fiscal officer is the Commissioner of the Department of Labor, the penalty shall be paid to said Commissioner for deposit in the State Treasury.
- 6) Upon the entry and service of such order, the Commissioner of Finance shall pay to the claimant, from the moneys due to the Contractor or Subcontractor, the amount of the claim as determined by the fiscal officer and the amount of the civil penalty, if any, shall be paid as provided herein, provided that no proceeding pursuant to Article Seventy-Eight of the Civil Practice Law and Rules for review of said order is commenced by any party aggrieved thereby within thirty days from the date of said order was filed in the office of the fiscal officer. Said proceeding shall be directly in the appellate division of the Supreme Court. Where the fiscal officer is the Commissioner of the Department of Labor, the civil penalty shall be paid to said Commissioner for deposit in the State Treasury. In the event that such a proceeding for review is instituted, moneys sufficient to satisfy the claim and civil penalty shall be set aside by the Commissioner of Finance, subject to the order of the Court.

INFORMATION FOR BIDDERS

- 7) When final determination has been made and such determination is in favor of the complainant, said complainant may in addition to any other remedy provided by this article, institute an action in any Court of appropriate jurisdiction against the person or corporation found violating this article, any substantially-owned affiliated entity or any successor of the Contractor or Subcontractor, any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article, and any of the partners if the Contractor or Subcontractor is a partnership or any of the five largest shareholders of the Contractor or Subcontractor, as determined by the fiscal officer, for the recovery of the difference between the sum, if any, actually paid to him by the Commissioner of Finance pursuant to said order and the amount found to be due him as determined by said order. Such action must be commenced, within three years from the date of the filing of said order, or if the said order is reviewed in a proceeding pursuant to Article Seventy-eight of the Civil Practice Law and Rules, within three years after the termination of such review proceeding.

- 8) When two final determinations have been rendered against a Contractor, Subcontractor, successor, or any substantially owned affiliated entity of the Contractor or Subcontractor, any of the partners if the Contractor or Subcontractor is a partnership, any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article, any of the five largest shareholders of the Contractor or Subcontractor or any successor within any consecutive six-year period determining that such Contractor, Subcontractor, successor, or any substantially-owned affiliated entity of the Contractor or Subcontractor, any of the partners or any of the five largest shareholders of the Contractor or Subcontractor, any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article has willfully failed to pay the prevailing rate of wages or to provide supplements in accordance with this article, whether such failures were concurrent or consecutive and whether or not such final determinations concerning separate public work projects are rendered simultaneously, such Contractor, Subcontractor, successor, or any substantially-owned affiliated entity of the Contractor or Subcontractor, any of the partners if the Contractor or Subcontractor is a partnership or any of the five largest shareholders of the Contractor or Subcontractor, any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article shall be ineligible to submit a bid on or be awarded any public work contract or subcontract with the State, any municipal corporation or public body for a period of five years from the second final determination, provided, however, that where any such final determination involves the falsification of payroll records or the kickback of wages or supplements, the Contractor, Subcontractor, successor, or any substantially-owned affiliated entity of the Contractor or Subcontractor, any partner if the Contractor or Subcontractor is a partnership or any of the five largest shareholders of the Contractor or Subcontractor, any officer of the Contractor or Subcontractor who knowingly participated in the violation of this article shall be ineligible to submit a bid on or be awarded any public work contract with the State, any municipal corporation or public body for a period of five years from the first final determination.

INFORMATION FOR BIDDERS

- 9) Nothing in this subdivision shall be construed as affecting any provision of any other law or regulation relating to the awarding of public contracts.

Pursuant to Section 220-C of the Labor law, any Contractor or Subcontractor who shall upon his oath verify any statement required to be filed herein, which is known by him to be false, shall be guilty of perjury and punishable as provided by the Penal Law.

10. CONTRACTOR'S REPORT OF EMPLOYMENT AND WEEKLY AFFIDAVIT

Each week the Contractor shall furnish to the Commissioner of Public Works the "Contractor's Report Of Employment And Weekly Affidavit" of the Sample Forms.

11. LAWS/REGULATIONS AND APPROPRIATIONS

- A. The Contractor shall, at its own cost and expense, comply with all provisions of the Labor Law (i.e. prevailing rate of wages and supplements), Lien Law, Workmen's Compensation Law and all other laws and ordinances affecting this contract or order, either Federal, State or local.
- B. It is recognized and understood by the Parties that when this Agreement is subject to future appropriation by the Westchester County Board of Legislators for funds not presently appropriated to pay for this Agreement; the County shall have no liability under this agreement beyond the funds, if any, that are appropriated and available for payment of the amounts due under this Agreement. The Parties understand and intend that the obligation of the County to pay the amounts due hereunder shall constitute a current expense of the County and shall not in any way be construed to be a debt of the County in contravention of any applicable constitutional or statutory limitations or requirements concerning the creation of indebtedness by the County, nor shall anything contained in this Agreement constitute a pledge of the general tax revenues, funds or monies of the County. The County shall pay amounts due under this Agreement exclusively from legally available funds appropriated for this purpose. Notwithstanding the foregoing, the County will do all things lawfully within its power to obtain, maintain, and properly request and pursue funds from which payments under this Agreement may be made, including: (i) the County Executive making provisions for such payments to the extent necessary in the annual budget submitted to the Board of Legislators for the purpose of obtaining funding; and (ii) using its reasonable efforts to have such portion of the budget approved.

12. REFUSAL TO ANSWER QUESTIONS

It is understood and agreed by the Contractor that he/she bears an affirmative obligation to answer questions specifically or directly relating to this agreement before any official, board or agency authorized or empowered to inquire into such matters. This section shall not be construed as barring the Contractor, its directors, officers or employees from exercising their constitutional privilege against self-incrimination.

The foregoing, however, shall not be construed as limiting the rights and remedies of the County in the event of such refusal, and when such body or agency is wholly civil in nature,

INFORMATION FOR BIDDERS

failure or refusal to fully cooperate with and diligently answer the inquiries of such official, board or agency may constitute grounds for the termination of this agreement and/or the exercise of any and all other rights or remedies which the County may have by reason of such failure or refusal.

Any and all contracts made with the State, the County of Westchester, or any public department, agency or official thereof, since July 1, 1959 by such person and by any firm, partnership or corporation of which he is a member, partner, director or officer, may be canceled or terminated by the County of Westchester, without incurring any penalty or damages on account of such cancellation or termination, but any monies owing pursuant to said transaction or contract prior to the cancellation and termination, shall be paid.

The successful bidder will be required to make all books and records concerning this contract available during business hours, upon reasonable notice, to duly authorized County personnel for the purpose of ascertaining compliance and/or performance of all provisions of this contract. This provision shall survive the termination of this agreement and for a period of six (6) years thereafter.

13. BID REQUIREMENTS

The Bid must be made on the "Proposal Pages" included in this specification or as provided with an addendum. All blank spaces on said Proposal Pages must be filled in and no change shall be made in the phraseology or in the items as contained therein.

Any bid which fails to name a price per unit of measurement for each of the items for which quantities are given, may be held to be informal and rejected. Bids submitted on Proposal Pages that contain any omissions, alterations, additions or items not called for in the bid documents, or that are illegible, unbalanced, conditional, incomplete or contain irregularities of any kind, may be rejected as informal. If the various parts of the work have been divided into classes and/or items to enable the bidder to bid for different portions of the work in accordance with its estimate of their costs, in the event of any increase or decrease in the quantity will be paid for at the price bid for that particular item. The sum of the amounts for each class or item, obtained by multiplying the approximate quantity by the unit price, shall constitute the total sum bid.

In the event of a discrepancy between the written bid amount and the numerical bid amount, the written amount will take precedence and be controlling as to the amount of the Bid. Any such discrepancy shall be corrected as set forth in Article "Correction Of Errors" of the Information for Bidders.

14. MISCELLANEOUS ADDITIONAL WORK (ITEM W-800)

A. Description - Under this item each Contractor shall furnish all labor, material and equipment required to accomplish miscellaneous additional work:

- 1) Necessitated by encountering during the course of the work field conditions of a nature not determinable during design; or
- 2) For which no unit prices are applicable.

INFORMATION FOR BIDDERS

- B. Method of Measurement - Only that miscellaneous additional work shall be performed by the Contractor and will be paid for by the County, which has been authorized by the Commissioner or the Construction Administrator in writing, prior to its commencement.
- C. Article “Increase or Decrease of Quantities: Elimination of Items” of the Information for Bidders, will still apply relative to the percentage of the total awarded contract price that the work under the contract may be increased or decreased.
- D. Payment - The total amount paid to the Contractor will be determined in strict accordance with the provisions of Article “Extra Work: Increased Compensation/ Decreased Work: Credit to the Owner” of the General Clauses, and such payment will include only that overhead and profit that is applicable to the work performed under this item.
- E. Each Contractor shall include in its total bid the lump sum printed in the Proposal and any bid other than the specified amount will be considered informal.

15. CORRECTION OF ERRORS

Relative to dollar bid items and the required computations as submitted and performed by bidders on the proposal sheets, if there are any inconsistencies derived in multiplying unit bid prices by the stated quantities, the Commissioner reserves the right to reconcile the unit bid prices or the products of the unit bid prices and the stated quantities, when in the Commissioner's professional opinion such reconciliation(s) would concur with the apparent intent of a bidder and the Commissioner's estimated values of the respective bid items of the proposed contract work. In addition to the foregoing, the Commissioner reserves the right to correct all mathematical errors in additions or subtractions.

16. SHOWN QUANTITIES

All bids shall be submitted upon the following express conditions, which shall apply to and become a part of every bid received. The Bidders accept the quantities shown on the Proposal Pages opposite items of the work for which unit prices are to be bid as being approximate estimated quantities. Bidders shall satisfy themselves by personal examination of the location of the proposed work and surroundings thereof, and by such other means as they may prefer, as to the scope of the work and the accuracy of the approximate estimated quantities; and shall not at any time after submission of their bids dispute such approximate estimated quantities nor assert that there was any misrepresentation by the County or any misunderstanding by the Contractor in regard to the quantity or kind of materials to be furnished, or work to be done.

17. QUALIFICATION OF BIDDERS

The County may make such investigation as it deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish all information and data for this purpose as may be requested. The County reserves the right to reject any bid if the evidence submitted by, or the investigation of such bidder fails to satisfy the County, in the County's sole discretion, that it is properly qualified to carry out the obligations of the contract and to complete the contemplated work.

INFORMATION FOR BIDDERS

18. REQUIRED EXPERIENCE

The County requires that each contractor possess not less than five (5) year's experience in performing work substantially similar in scope and size to the work for which it is bidding. The contractor agrees that upon request of the County the contractor will furnish a detailed statement of each project that it has performed during the most recent five (5) years (including but not limited to the name and address of the project, the name of the awarding entity/owner, the name of the awarding entity's/owner's representative, a current telephone number where that representative can be reached, the description of the project, general scope of the contractor's work, contract price, dates of performance, whether the contract was terminated for cause or convenience, whether the contract was completed and whether liquidated damages were assessed against the contractor [and if so, provide a written explanation]). The County reserves the right to require additional information as it deems appropriate concerning the history of the contractor's performance of each such contract. The final determination of whether the contractor possesses the requisite experience rests in the sole discretion of the County.

19. INCREASE OR DECREASE OF QUANTITIES: ELIMINATION OF ITEMS

In entering into this contract, the Contractor agrees that quantities shown on the Proposal Pages opposite items of the work for which unit prices have been requested are approximate estimated quantities, and that during the progress of the work the County may find it advisable and shall have the right to omit portions of the work, and to increase or decrease the shown approximate estimated quantities, or the scope of the whole work; and that the County reserves the right to add to or take from the total amount of the work up to a limit of thirty percent of the total amount of the contract based upon the executed contract price for all the specified work.

The Contractor shall make no claim for anticipated profits or loss of profits, because of any difference between the quantities of the various classes of work actually done, or of the materials actually furnished, and the original specified scope of work and the shown approximate estimated quantities.

The aforesaid thirty- percent pertains to the total amount of the contract and not to any individual item. Individual items may be increased or decreased any amount or may be eliminated entirely if so ordered by the Commissioner, excepting that the total amount of the contract as adjusted shall not result in a net increase or decrease of more than thirty percent except by mutual agreement between both parties thereto.

The Contractor waives all claims of any nature due to a misunderstanding of the location, character, or other conditions surrounding the work or of the shown approximate estimated quantities of items of the work.

20. BREAKDOWN COST OF LUMP SUM ITEMS AND CONTRACTS

After award of the contract and prior to actual start of the work, the successful bidder shall submit an itemized schedule of its estimated costs of lump sum items and or lump sum total contract work, for approval by the County. The schedule shall be submitted as an outline series with minor subdivisions, in accordance with the directives of the County. As part of

INFORMATION FOR BIDDERS

this Schedule, the Contractor will be required to include a sum sufficient, as determined in the County's sole discretion, for the preparation and submission of approved final "As-builts", record drawings, guarantees, warranties, and operations and maintenance manuals.

21. ENGINEERING CHARGES

In addition to any and all other remedies available to the County when the work embraced in the contract is not completed on or before the date specified herein, engineering and inspection expenses incurred by the County of Westchester upon the work from the completion date originally fixed in the contract to the final date of completion of the work may be charged to the Contractor and be deducted from monies due the Contractor. Consideration of any extra work or supplemental contract work added to the original contract, as well as extenuating circumstances beyond the control of the Contractor, will be given due consideration by the County before assessing engineering and inspection charges against the Contractor. Such charges will be assessed, however, in cases where in the opinion of the Commissioner, the Contractor has delayed the work.

22. ESTIMATES AND PAYMENTS

As the work progresses but not more often than once a month and then on such days as the Construction Administrator may fix, the Contractor will submit a requisition in writing of the amount and value of the work performed and the materials and equipment provided to the date of the requisition, less any amount previously paid to the Contractor. The Contractor must complete at least ten (10%) percent of the work before submitting any claims for mobilization. From each requisition, the County will retain five percent (5%) plus one hundred fifty percent (150%) of the amount necessary to satisfy any claims, liens or judgments against the Contractor that have not been suitably discharged. The Commissioner will thereupon cause the balance of the requisition therein to be paid to the Contractor. In lieu of all or part of the cash retainage the County shall only accept bonds or notes of United States of America, New York State or political subdivisions thereof. As a condition to the making of any progress payment as set forth in this paragraph, the County, in its sole discretion may require the Contractor to submit such document as may be reasonably required to establish that the Contractor (and its subcontractor(s)) have timely and properly paid their respective subcontractor(s) and materialmen of whatever tier.

VENDOR DIRECT PAYMENT: All payments made by the County to the Contractor will be made by electronic funds transfer ("EFT") pursuant to the County's Vendor Direct program. The Contractor is required to complete the Vendor Direct Payment Authorization Form, which is located in the Forms Section on page 11 and 12. Payments will be automatically credited to the Contractor's designated bank account at the Contractor's financial institution. Payments are anticipated to be deposited two business days after the voucher/invoice is processed for payment. Saturdays, Sundays, and legal holidays are not considered business days. Under the Vendor Direct program you will receive an e-mail notification two days prior to the day the payment will be credited to your designated account. The e-mail notification will come in the form of a remittance advice with the same information that currently appears on County check stubs and will contain the date that the funds will be credited to your account. If there is a discrepancy in the amount received please contact

INFORMATION FOR BIDDERS

your Westchester County representative as you would have in the past if there were a discrepancy in a check.

In the unlikely event that you do not receive the money in your designated bank account on the date indicated in the e-mail, please contact the Westchester County Accounts Payable Department at 914-995-3748. Whenever you change your bank or change or close your account a new Vendor Direct Payment Authorization Form must be submitted. Please contact the Westchester County Accounts Payable Department at 914-995-3748 and a new form will be e-mailed to you. When completing the payment authorization form you must either supply a voided check or have it signed by a bank official to ensure the authenticity of the account being set up to receive your payments. Failure to return the completed authorization form prior to award of the contract may result in the bid being considered non-responsive and the bid may be rejected.

When the work or major portion thereof, as contemplated by the terms of the contract (see Substantial Completion Payment and Final Payment later in this article), are substantially completed in the judgment of the Commissioner, the Contractor shall submit a requisition for the remainder of the contract balance. An amount equal to two (2) times the value of the remaining items to be completed plus one hundred fifty percent (150%) of the amount that the Commissioner deems necessary to satisfy to satisfy any claims, liens or judgments against the Contractor which have not been suitably discharged shall be deducted from the requisition. As the remaining items of work are satisfactorily completed or corrected, the County will, upon receipt of a requisition, pay for these items less one hundred fifty percent (150%) of the amount necessary to satisfy any claims, liens or judgments.

Contractor agrees, in the event of any withdrawal by the contractor of amounts retained from payments to the contractor pursuant to the terms hereof, that notwithstanding any contrary interpretation of Section 106 of the New York General Municipal Law, the contractor will be obliged to maintain the market value of securities deposited in an amount equal to the amount withdrawn pursuant to said Section 106. The Contractor will, within five (5) days of demand therefore by the fiscal officer of the County, deposit with such fiscal officer cash, or securities of the kind provided in Section 106, of a market value sufficient to maintain the market value of all securities on deposit at a level equal (as of the date such notice of the fiscal officer is given to the contractor) to the amount which the County shall be entitled to retain from payments to the contractor pursuant to the terms of the contract.

All estimates will be made for actual quantities for work performed and materials and equipment incorporated in the work as determined by the measurements of the Engineer, and this determination shall be accepted as final, conclusive and binding upon the Contractor. All estimates will be subject to correction in any succeeding estimate.

Payment will be made for materials pertinent to the project which have been delivered to the site or off-site by the Contractor and/or Subcontractor and suitably stored and secured in first-class condition as required by the Construction Administrator. Payment may be limited to materials in short and/or critical supply and materials specially fabricated for the project, as defined by the contract. Payment will be made only upon the written request of the contractor. The Contractor must submit certified copies of the manufacturer's or vendor's invoices or statements establishing the true purchase value of the material or equipment; freight bills, release of liens and certificate of insurance covering all equipment and materials. Then the County will include in the following monthly payment an amount not to

INFORMATION FOR BIDDERS

exceed the lesser of the bid breakdown or the total purchase price of the stored equipment and materials less retainage provided that such equipment and materials are suitable for their intended use.

The Contractor shall be responsible for safeguarding stored equipment and materials against loss or damage of any nature whatsoever, shall retain title until incorporated into the work and acceptance by the County and in case of loss or damage, the Contractor shall replace such lost or damaged equipment and materials at no cost to the County.

After receipt of payment, the Contractor shall not remove from the site equipment and materials for which such payment was made without written authorization from the Commissioner.

No major equipment item shall be brought to the site until the following conditions are met:

- 1) The County must have received the manufacture's recommendations for on-site storage in writing.
- 2) The structure in which the equipment is to be installed is roofed (roofing must be watertight) and has such protection of doorways, windows, and other openings that will provide reasonable protection from the weather.
- 3) Prior to the County making a Partial Payment on a major equipment item the following conditions must be met:
 - a. The Contractor must certify to the County, in writing, that the equipment has been properly stored.
 - b. The Shop Drawings must be approved and the draft Operation and Maintenance Manuals must have been submitted.

The Contractor shall furnish to the Construction Administrator, prior to the making up of any Partial or Final Estimate, a copy of its and its Subcontractors' weekly payrolls for each and every preceding payroll period. The payroll submitted shall be a certified true copy and shall contain full information including but not limited to the number of hours worked, rate, classification and total sum paid each employee charged to or working on the job. With all except the first estimate, the Contractor shall furnish to the Construction Administrator a sworn statement listing all unpaid bills and liabilities incurred under the Contract.

A. Substantial Completion Payment

- 1) Within thirty (30) days after receiving written notice from the Contractor of substantial completion of the work under this Agreement, the Commissioner will cause an inspection to be made of the work done under this contract. If, upon such inspection, the Engineer determines that the work is substantially complete, a Substantial Completion Payment to the Contractor for the work done under this Contract, less any and all deductions authorized to be made by the Commissioner under this contract or by law, will be issued.
- 2) Such a Payment shall be considered a Partial and not a Final Payment.
- 3) As a condition precedent to receiving payment therefore, the Contractor must have received County approval of all Shop Drawing submittals, the Operation and Maintenance Manuals, and As-Built Drawing(s). Together with its application for substantial completion payment the Contractor shall also deliver to the

INFORMATION FOR BIDDERS

Construction Administrator a verified statement certifying that all claims or liabilities arising from the completed work, including all charges for Extra Work, Change Orders, additional time, damages or credits (collectively referred to as “claims”) have been presented to the County. All such claims shall be described in sufficient detail so as to be easily identified. The Contractor’s failure to submit the verified statement shall constitute a full and final waiver of all claims against the County from the beginning of the project through the date of substantial completion as established by the County. The presentation of the verified statement to the County shall not constitute an acknowledgement by the County that any such claim is valid. The County expressly reserves its right to assert that any such claim(s) is waived or precluded by reason of other provisions of the contract documents. Only claims particularly identified on the Contractor’s verified statement shall be preserved; all other claims whatever nature shall be deemed waived and released. It shall also submit proof of title of the materials and equipment covered by the contract. The Contractor shall also, prior to the issuance of said Substantial Completion Payment, supply to the County affidavits and certificates for labor, material and equipment (where applicable).

B. Final Payment

- 1) Within ten (10) days after receiving written notice from the Contractor of completion of all the work, the Engineer will make a final inspection. If upon inspection the Engineer determines that no further work is needed, the Commissioner will request that the Board of Acquisition and Contract approve the completion of the project and authorize payment of the Final Estimate. Also required prior to the Board of Acquisition and Contract approval is a Condition Report by the Contractor that any damage of public or privately owned properties resulting from the Contractor’s work has been satisfactorily repaired.
- 2) As a condition precedent to receiving Final Payment therefore the Contractor shall submit a supplementary verified statement similar to that required under, “A. Substantial Completion Payment”, hereof. This verified statement must include only those charges for Extra Work, Change Orders, additional time, damages or credits (collectively referred to as “claims”) that accrued between substantial completion and final completion. The Contractor’s failure to submit the verified statement shall constitute a full and final waiver of all claims against the County from the beginning of the project through the date of substantial completion as established by the County. The presentation of the verified statement to the County shall not constitute an acknowledgement by the County that any such claim is valid. The County expressly reserves its right to assert that any such claim is waived or precluded by reason of other provisions of the contract documents. Only claims particularly identified on the Contractor’s supplementary verified statement shall be preserved; all other claims of whatever nature shall be deemed waived and released.
- 3) The Contractor shall also, prior to the issuance of Final Payment, supply to the County affidavits and certificates for labor, material and equipment (where applicable).

INFORMATION FOR BIDDERS

- 4) The County will, not less than thirty (30) days after the Final Acceptance of the work under this contract, by the Board of Acquisition and Contract, pay the Contractor upon the receipt of all required documentation the balance of funds due thereunder after deduction of all previous payments, liens and all percentages and amounts to be kept and retained under provision of this contract.

All prior Partial Payments, being merely estimates made to enable the Contractor to prosecute the work more advantageously, shall be subject to correction in the Final Estimate and Payment

- 5) The acceptance by the Contractor or by anyone claiming by or through him of the Final Payment shall operate as and shall be a release to the County and every officer and agent thereof, from any and all claims of the Contractor for anything done or furnished in connection with this work or project and for any act or omission of the County or of any others relating to or affecting the work. No payment, however, final or otherwise, shall operate to release the Contractor or its Sureties from any obligation under this contract or the Performance and Payment Bond. Should the Contractor refuse to accept the final payment as tendered by the County, it shall constitute a waiver of any rights to interest thereon. Nor shall refusal to accept final payment extend any applicable statute of limitation.

23. PAYMENTS TO SUBCONTRACTORS AND MATERIALMEN BY CONTRACTOR

Within fifteen calendar days of the receipt of any payment from the County, the contractor shall pay each of its sub-contractors and materialmen the proceeds from the payment representing the value of the work performed and/or materials furnished by the subcontractor and/or materialmen as reflected in the payment from the owner less an amount necessary to satisfy any claims, liens or judgment against the subcontractor or materialman which have not been suitably discharged and less any retained amount as hereafter described. The contractor shall retain not more than five per centum of each payment to the subcontractor and/or materialman except that the contractor may retain in excess of five per centum but not more than ten per centum of each payment to the subcontractor provided that prior to entering into a subcontract with the contractor, the sub-contractor is unable or unwilling to provide a performance bond and a labor and material bond both in the full amount of the sub-contract at the request of the contractor. However, the contractor shall retain nothing from those payments representing proceeds owed the subcontractor and/or materialman from the County's payments to the contractor for the remaining amounts of the contract balance as provided in Article "Estimates and Payments" of the Information For Bidders. Within fifteen calendar days of the receipts of payment from the contractor, the subcontractor and/or materialman shall pay each of its subcontractors and materialmen in the same manner as the contractor has paid the subcontractor.

Nothing provided herein shall create any obligation on the part of the County to pay or to see the payment of any moneys to any subcontractor or materialman from any contractor nor shall anything provided herein serve to create any relationship in contract or otherwise, implied or expressed between the subcontractor or materialman and the County. Notwithstanding anything to the foregoing, the County may tender payments to the Contractor in the form of joint or dual payee checks.

INFORMATION FOR BIDDERS

NOTICE: No direct payment will be made for work done or materials furnished under the General Clauses, Information for Bidders, General Clauses and Special Clauses, except where expressly stated elsewhere, but compensation shall be deemed to be included in the contract lump sum price for the total work and/or the contract unit prices for the various items of the work.

24. TIME OF STARTING

Time being of the essence, all bidders shall take notice that the timely completion of the work called for under this contract is of the greatest importance. The contractor shall commence its work within ten (10) days after "notice to proceed" has been given it by the Commissioner (unless a definite starting date is stated). Prior to commencing its work, the Contractor shall notify the Director of Project Management, Division of Engineering and Department of Public Works, at least forty-eight (48) hours prior to the planned date of its "start", so that a Construction Administrator can be assigned to the work.

25. SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION AND DEMOLITION WORK

At all times the Contractor shall use all required and necessary precautions for the safety and protection of the public, County personnel, construction employees, and private and public property on or adjacent to the work.

The Contractor shall comply fully with all the applicable provisions of the following listed governmental regulations and standards, noting that in case of conflict, the Contractor shall comply with the most stringent rule or regulation:

- 1) State of New York, Department of Labor, Bureau of Standards and Appeals, Industrial Code Rule 23 "Protection of Persons Employed in Construction and Demolition Work."
- 2) United States Department of Labor, Bureau of Labor Standards, "Safety and Health Regulations for Construction," as promulgated in accordance with the Occupational Safety and Health Act of 1970, Public Law 91-596; 84 Stat. 1590, Laws of 91st Congress - 2nd Session.

It shall be the sole responsibility of the Contractor to ascertain which of the regulations and standards contained in the foregoing listed publications effect its construction activities, and it shall be solely responsible for the penalties resulting from its failure to comply with such applicable rules and regulations. Copies of the listed publications are available for reference purposes only, in the Westchester County Department of Public Works, Division of Engineering, Design Section, Room 500, Michaelian Office Building, White Plains, New York.

The West Nile Mosquito control program:

- 1) Routinely, the work site should be inspected for potential habitats (i.e. stagnant/standing water) for mosquitoes.
- 2) Conditions that would require remediation include: improper site grading, ruts/other depressions, water in debris (i.e. containers, tires, etc.), stored or

INFORMATION FOR BIDDERS

discarded materials, and excavations, and those cited by the Construction Administrator.

- 3) Under the direction of the Construction Administrator, the Contractor shall take all necessary preventive and/or corrective action to eliminate the potential breeding grounds.

26. ACCIDENT PREVENTION AND FIRST AID FACILITIES

In addition to conforming to the applicable governmental regulations and standards referred to in Article "Fire Prevention And Control" of the Information For Bidders, the Contractor shall conduct its work in accordance with the recommendations contained in the latest edition of the "Manual of Accident Prevention in Construction," as published by the Associated General Contractors of America, Inc. and the most recent safety codes approved by the American Standards Association. In case of the conflict with the referenced governmental regulations and standards, the most stringent regulation, standard or recommendation shall govern.

Further, and without in any way limiting the Contractor's obligations hereunder, and in accordance with the instructions of the Construction Administrator, the Contractor shall provide barricades, warning lights, danger and caution signs and other safeguards at all places where the work in any way is a hazard to the public.

The Contractor shall also provide and maintain upon the site at each location where major work is in progress, a completely equipped first aid kit that shall be readily accessible when construction activities are in progress. Posted on each first aid kit shall be the name, location and telephone number of the nearest hospital or doctor with whom the Contractor has previously made arrangements for emergency treatment in case of accident.

27. FIRE PREVENTION AND CONTROL

The Contractor shall abide by such rules and instructions as to fire prevention and control as the municipality having jurisdiction may prescribe. It shall take all necessary steps to prevent its employees from setting fires not required in the construction of the facility and shall be responsible for preventing the escape of fires set in connection with the construction.

It shall at all times provide the proper housekeeping to minimize potential fire hazards, and shall provide approved spark arresters on all steam engines, internal combustion engines and fuels.

Free access to fire hydrants and standpipe connections shall be maintained at all times during construction operations, and portable fire extinguishers shall be provided by the Contractor and made conveniently available throughout the construction site. The Contractor shall also notify its employees of the location of the nearest fire alarm box at all locations where work is in progress.

INFORMATION FOR BIDDERS

28. STATE AND LOCAL SALES TAX EXEMPTION

The Contractor's attention is directed to Section 1115 of the Tax Law of New York State, Chapters 513 and 514 of the Laws of 1974. In connection with capital improvement contracts entered into on or after September 1, 1974, all tangible personal property which will become an integral component of a structure, building or real property of New York State, or any of its political sub-divisions, including the County of Westchester, is exempt from State and local retail sales tax and compensating use tax.

Bidders' proposals shall exclude dollar amounts for the payment of State and Local retail sales tax and compensating use tax, for tangible personal property defined above.

The successful bidder shall be obliged to file the required Contractor Exempt Purchase Certificates, which may be obtained from the New York State Department of Taxation and Finance (1-800-462-8100), in order to utilize such exemption.

29. APPRENTICES

The attention of all bidders is directed to Section 220(3-e) of the New York State Labor Law, which is hereby incorporated herein by reference, which requires, among other things, that "Apprentices who are registered under a Bona Fide New York State Registered Apprentice Training Program shall be permitted to work."

30. AFFIRMATIVE ACTION PROVISION

During the performance of this Contract, the Contractor agrees that it will not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, age or handicap. Contractor shall take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, national origin, age or handicap. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoffs or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor agrees to include, or require the inclusion of the above provision in any subcontract made pursuant to its contract with the County.

31. AFFIRMATIVE ACTION PROGRAM REQUIREMENT

Relative to the award of this Contract, it is required that all bidders completely answer all questions contained in the questionnaire entitled "Affirmative Action Program Requirement" of the Proposal Pages, and properly attest to same.

It is also required that all subcontractors completely answer all questions contained in the questionnaire entitled "Affirmative Action Program Requirement-Subcontractors" of the Sample Forms, and properly attest to same. This form is to be submitted with the request to utilize subcontractor(s).

INFORMATION FOR BIDDERS

32. AUTHORITY TO DO BUSINESS IN NEW YORK

Any corporation not incorporated under the Laws of New York State, must furnish a copy of its certificate of authority, from the New York State Secretary of State, to do business in the State of New York, in accordance with Article 13 of the New York State Business Corporation Law.

33. LICENSE REQUIREMENTS (ELECTRICAL)

- A. In accordance with the requirements of Local Law No. 20-1997 of Westchester County, no person shall perform work under any contract with the County of Westchester except (i) a licensed Master Electrician; (ii) a licensed "Special Electrician"; or (iii) a Journeyman Electrician working under the direct supervision and control of a Master Electrician.

In no event shall the County incur any liability to pay for any electrical work performed in violation of the licensing requirements of Local Law No. 20-1997 of Westchester County.

- B. Contract with separate bids:

If the project is one where separate bid specifications are required pursuant to the provisions of the New York General Municipal Law, then any person, partnership, corporation, business organization or other business entity submitting a bid for the electrical portion of the project must possess, at the time of submission of the Bid, a valid Master/"Special" Electrician's license issued by the Westchester County Electrical Licensing Board in accordance with Chapter 277 Article XVII of the Laws of Westchester County and the Westchester County Electrical Licensing Board Rules & Regulations, in particular No. 11, which states as follows:

No individual holding a Master Electrician's License shall lend such License to any person or allow any other person to carry on, engage in, or labor at the business as defined herein of installing, removing, altering, testing, replacing, or repairing electrical systems. A violation of this section by any person holding a License shall be sufficient cause for revocation of such License.

However, nothing herein shall be construed to prohibit the use of a License by the holder thereof for or on behalf of a partnership, corporation or other business association, provided that fifty-one (51) percent or more of the control of the voting capital stock of such partnership, corporation, or other business association is owned by one (1) or more holders of a Westchester County Master Electrical License and that all work performed by such partnership, corporation or other business association is performed by or under the direct supervision of such License holder or holders.

- C. Contract with single bid:

Where the project does not involve separate bids pursuant to the New York General Municipal Law but where some electrical work is contemplated along with other work, the person, firm, partnership or corporation engaged to perform said electrical work

INFORMATION FOR BIDDERS

must possess a valid Master/"Special" Electrician's license issued by the Westchester County Electrical Licensing Board.

- D. An electrical bidder must complete the "Certificate of License (Electrical)" of the Proposal Pages and will be required to furnish a copy of such license with the sealed Bid. Other bidders will be required to furnish a copy of such license for the applicable person engaged to perform the electrical work when request by the County, prior to awarding the contract.
- E. The license must be maintained at all times during the performance of the work contemplated under the contract. The suspension, revocation or the failure to maintain or renew such license shall, in addition to any other right or remedy available to the County, be grounds for immediate termination of the contract, effective immediately upon notice from the Commissioner.

34. LICENSE REQUIREMENTS (PLUMBING)

- A. In accordance with the requirements of Chapter 277, Article XV of the Laws of Westchester County, no person shall perform plumbing work under any contract with the County of Westchester except (i) a licensed Master Plumber; (ii) a certified Journey Level Plumber employed by and under the direction of a licensed Master Plumber; or (iii) an Apprentice Plumber working under the direct supervision and control of a Master Plumber or under the direct supervision and control of a certified Journey Level Plumber in the employ of a licensed Master Plumber.

In no event shall the County incur any liability to pay for any plumbing work performed in violation of the licensing requirements of Chapter 277, Article XV of the Laws of Westchester County.

- B. Contract with separate bids:

If the project is one where separate bid specifications are required pursuant to the provisions of the New York General Municipal Law, then any person, partnership, corporation, business organization or other business entity submitting a bid for the plumbing portion of the project must possess, at the time of submission of the Bid, a valid Master Plumber's license issued by the Westchester County Board of Plumbing Examiners in accordance with the Westchester County Board of Plumbing Examiners Rules and Regulations and Chapter 277 Article XV of the Laws of Westchester County, in particular Section 277.509A, which states as follows:

- A. No holder of a license or certification issued under this article shall authorize, consent to or permit the use of his or her license or certification by or on behalf of any other person. No person who has not qualified or obtained a license or certification under this article shall represent himself or herself to the public as holder of a license or certification issued under this article, either directly, by means of signs, sign cards metal plates or stationery, or indirectly in any other manner whatsoever. However, nothing herein shall be construed to prohibit the use of a license by the holder thereof for or on behalf of a partnership, corporation or other business association, provided that 51 percent or more of the control of the voting capital stock of such partnership, corporation or other business

INFORMATION FOR BIDDERS

association is owned by one or more holders of a Westchester County master plumbing license and that all work performed by such partnership, corporation or other business association is performed by or under the direct supervision of such license holder or holders.

C. Contract with single bid:

Where the project does not involve separate bids pursuant to the New York General Municipal Law but where some plumbing work is contemplated along with other work, the person, firm, partnership or corporation engaged to perform said plumbing work must possess a valid Master Plumber's license issued by the Westchester County Board of Plumbing Examiners.

D. A plumbing bidder must complete the "Certificate of License (Plumbing)" of the Proposal Pages and will be required to furnish a copy of such license and the County issued identity badge with the sealed Bid. Other bidders will be required to furnish a copy of such license and the County issued identity badge for the applicable person engaged to perform the plumbing work when request by the County, prior to awarding the contract.

E. A restricted Master Plumber's license issued by the Westchester County Board of Plumbing Examiners shall satisfy the requirements of this section provided such restricted license authorizes the Master Plumber to engage in the business of plumbing within the local municipality in which the work under the contract is to be performed.

F. The license must be maintained at all times during the performance of the work contemplated under the contract. The suspension, revocation or the failure to maintain or renew such license shall, in addition to any other right or remedy available to the County, be grounds for immediate termination of the contract, effective immediately upon notice from the Commissioner.

35. LICENSE REQUIREMENTS (HAULERS)

(Haulers Of Solid Waste; Recyclables; Construction And Demolition Debris; Garden And Yard Waste And/Or Scrap Metal)

A. DEFINITIONS:

- 1) "Class A" refers to all haulers except those whose hauling business is limited solely to Class C, Class D or Class E activities or whose recycling business is limited to Class B activities. Class A Licensees may also conduct Class B, Class C, Class D and Class E activities.
- 2) "Class B" refers to Recyclable brokers. Class B Licensees may also conduct Class C, Class D and Class E activities.
- 3) "Class C" refers to haulers who exclusively handle construction and demolition debris. Class C Licensees may also conduct Class D and Class E activities. With respect to Class C haulers, the following shall apply: a. Class "C-1" shall refer to a business or subsidiary which generates construction and demolition debris, as defined herein, and which, incidental to such business, transports, stores, processes, transfers or disposes of the construction and demolition debris generated by the

INFORMATION FOR BIDDERS

operations of such business or subsidiary. Class "C-1" Licensees may also conduct Class E activities; b. Class "C-2" shall refer to all other businesses which otherwise transport, collect, store, transfer, process, or dispose of construction and demolition debris. Class "C-2" haulers may also conduct Class "C-1", Class D and Class E activities.

- 4) "Class D" refers to (i) haulers who collect, store, transport, transfer, process or dispose of garden and yard waste generated, originated or brought within the County where such garden and yard waste was previously generated by a person or entity other than the Licensees and/or (ii) haulers who collect, store, transport, transfer, process or dispose of garden and yard waste and which own, lease, or control one or more vehicles having three (3) or more axles which vehicles will be used in the collection, storage, transfer, transportation, processing or disposal of garden and yard waste generated, originated or brought within the County.
- 5) "Class E" refers to haulers who exclusively conduct a scrap peddler business.
- 6) "Construction and Demolition Debris" means uncontaminated Solid Waste resulting from the construction, remodeling, repair and demolition of structures and roads, and uncontaminated Solid Waste consisting of vegetation resulting from land clearing and grubbing, utility line maintenance and seasonal and storm-related cleanup. Such waste includes, but is not limited to, bricks, concrete and other masonry materials, soil, rock, wood, wall coverings, plaster, drywall, plumbing fixtures, non-asbestos insulation, roofing shingles, asphaltic pavement, glass, plastics that are not sealed in a manner that conceals other waste, electrical wiring and components containing no hazardous liquids, metals, and trees or tree limbs that are incidental to any of the above.
- 7) "Hauler" means any person excluding municipalities, the County and any County district including, but not limited to, Refuse Disposal District No. 1 and all County sewer and water districts, who, for a fee or other consideration, collects, stores, processes, transfers, transports or disposes of Solid Waste, Recyclables or construction and demolition debris that is generated or originated within the County or brought within the boundaries of the County for disposal, storage, transfer or processing.
- 8) "Recyclables" means those materials defined as "Recyclables" under Section 825.30 (8) of the Westchester County Source Separation Law.
- 9) "Scrap Peddler" shall mean any person who collects scrap materials for sale to a Recyclable broker using no more than one vehicle for collection and transportation of such materials.
- 10) "Solid Waste" means all putrescible and non-putrescible materials or substances, except as described in Paragraph 4 of 6 NYCRR Part 360-1.2(a), and/or regulated under 6 NYCRR Part 364, that are discarded or rejected as being spent, useless, worthless or in excess to the owners at the time of such discard or rejection including, but not limited to, garbage, refuse, commercial waste, rubbish, ashes, incinerator residue and construction and demolition debris. "Solid Waste" shall not be understood to include Recyclables as defined above.

INFORMATION FOR BIDDERS

- B. **PLEASE TAKE NOTICE** - In accordance with the requirements of Chapter 826-a, Article III of the Laws of Westchester County, it is unlawful for any person to collect, store, transfer, transport or dispose of solid waste; recyclables; construction and demolition debris; garden and yard waste and/or scrap metal, as defined herein, that is generated or originated within the County or brought within the boundaries of the County for disposal, storage, transfer or processing, or to conduct any activities defined as Class A, Class B, Class C, Class D or Class E activities under Chapter 826-a of the Laws of Westchester County, in Westchester County (hereinafter collectively referred to as "hauling") without having first obtained a license therefore from the Westchester County Solid Waste Commission.

In no event shall the County incur any liability with respect to any hauling activities conducted by the bidder or any subcontractor of the bidder in violation of Chapter 826-a of the Laws of Westchester County.

- C. Where the project necessitates that hauling be performed, either the bidder or the person, partnership, corporation, business organization or other business entity engaged to perform such hauling work on behalf of the bidder (hereinafter the "subcontractor") must possess a valid license issued by the Westchester County Solid Waste Commission at the time of submission of the bid and throughout the duration of any contract issued pursuant thereto.
- D. A hauler bidder must complete the "Certificate of License (Hauler)" of the Proposal Pages and will be required to furnish a copy of such license with the sealed bid. Other bidders will be required to furnish a copy of such license for the applicable person engaged to perform the hauling work when requested by the County, prior to awarding the contract.
- E. The suspension, revocation, or the failure to maintain or renew such license may, in addition to any other right or remedy available to the County, be grounds for termination of the contract, effective immediately upon notice from the Commissioner. The bidder which is awarded the contract hereunder shall have a continuing obligation to notify the Commissioner, within (2) business days, of any suspension, revocation or other action taken with respect to any license issued by the Westchester County Solid Waste Commission which may limit or impair the bidder's ability, or the ability of any authorized subcontractor, to perform such hauling work in the County of Westchester.

It shall be the bidder's responsibility to ensure that any subcontractor who will perform the hauling services required under any contract issued pursuant to this bid specification has a valid license for the duration of the term of any contract awarded hereunder.

- F. In the event that a license held by the bidder or its subcontractor is revoked, suspended or otherwise discontinued by the Westchester County Solid Waste Commission, or in the event that the bidder is otherwise required to obtain the services of a new or alternate subcontractor for the hauling work, the bidder shall immediately notify the Commissioner and seek the Commissioner's approval for the use of such subcontractor to provide the hauling services which are required under the contract, and shall provide the Commissioner with a copy of the license issued by the Westchester County Solid Waste Commission to such subcontractor. No bidder or subcontractor shall provide

INFORMATION FOR BIDDERS

hauling services under the contract until a copy of its license has been provided to the Commissioner and the Commissioner has approved of such bidder or subcontractor.

36. MINORITY PARTICIPATION POLICY

- A. Pursuant to Chapter 308 of the Laws of the County of Westchester, the County encourages the meaningful and significant participation of business enterprises owned by persons of color and women - Minority Business Enterprise (MBE) and Women Business Enterprise(WBE); on County of Westchester contracts.
- B. It is the goal of the County of Westchester to use its best efforts to encourage, promote and increase participation of business enterprises owned and controlled by persons of color or women (MBE/WBE) in contracts and projects funded by all departments of the County and to develop a policy to efficiently and effectively monitor such participation.
- C. In recognition of the need to promote the development of business enterprises owned and controlled by persons of color and women to achieve a goal of equal opportunity, and overcome the existing under representation of these groups in the business community, the County of Westchester acting through its Office of Economic Development shall as a lawful public and County purpose provide technical and informational assistance to such business enterprises with a particular emphasis on education programs to encourage participation in the contract procurement process.
- D. For the purposes of this Local Law, a business enterprise owned and controlled by women or persons of color shall be construed to mean a business enterprise including a sole proprietorship, partnership or corporation that is: (a) at least 51% owned by one or more persons of color or women; (b) an enterprise in which such ownership by persons of color or women is real, substantial and continuing; (c) an enterprise in which such ownership interest by persons of color or women has and exercises the authority to control and operate, independently, the day-to-day business decisions of the enterprise; and (d) an enterprise authorized to do business in this state which is independently owned and operated. In addition, a business enterprise owned and controlled by persons of color or women shall be deemed to include any business enterprise certified as an MBE or WBE pursuant to Article 15-a of the New York State Executive Law and implementing regulations, 9 NYCRR Subtitle N Part 540 et seq., or as a small disadvantaged business concern pursuant to the Small Business Act, 15 U.S.C. 631 et seq., and the relevant provisions of the Code of Federal Regulations as amended.
- E. The Contractor hereby acknowledges and agrees:
 - 1) That in the hiring of employees for the performance of work under this contract or any subcontract hereunder, no contractor, subcontractor, nor any person acting on behalf of such contractor or subcontractor, shall be reason of race, creed, color, religion, gender, age, ethnicity, disability, sex, alienage or citizenship status, national origin, marital status, sexual orientation, familial status, genetic predisposition or carrier status discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates;

INFORMATION FOR BIDDERS

- 2) That no contractor, subcontractor, nor any person on its behalf shall, in any manner, discriminate against or intimidate any employee hired for the performance of work under this contract on account of race, creed, color, religion, gender, age, ethnicity, disability, sex, alienage or citizenship status, national origin, marital status, sexual orientation, familial status, genetic predisposition or carrier status;
 - 3) That there may be deducted from the amount payable to the contractor by the County under this contract a penalty of fifty (50) dollars for each person for each calendar day during which such person was discriminated against or intimidated in violation of the provisions of the contract;
 - 4) That this contract may be canceled or terminated by the County, and all moneys due or to become due hereunder may be forfeited, for a second or any subsequent violation of the terms or conditions of this section of the contract; and
 - 5) The aforesaid provisions of this section covering every contract for or on behalf of the County for the manufacture, sale or distribution of materials, equipment or supplies shall be limited to operations performed within the territorial limits of the State of New York.
 - 6) Contractor agrees to include, or require the inclusion of the above provision in any subcontract made pursuant to its contract with the County.
- F. In furtherance of the Contractor's obligation to make documented good faith efforts to utilize Minority Business Enterprises (MBE) and Women's Business Enterprises (WBE) for the Work required by this Contract, the Contractor shall provide the Minority/Women Business Enterprise Questionnaire signed by an officer of the Contractor, and any additional information requested by the County, including but not limited to the following, which shall be delivered to the Construction Administrator and _____, Program Manager of Minority- and Women-Owned Business Program, County of Westchester, Room 911, 148 Martine Avenue, White Plains, New York 10601 coincident with the Contractor's delivery to the County of its bid and shall be provided by the Contractor with any request for approval of subcontractors:
- 1 (a) The name, address, telephone number and contact person of each MBE and WBE solicited verbally by Contractor during the applicable period for the performance of any portion of the Contractor's Work and the date(s) that each such solicitation was made;
 - 1 (b) A description of the portion of the Contractor's Work for which each such solicitation is made.
 - 1 (c) A listing of the project documents, if any, furnished to each such MBE and WBE.
 2. A copy of each written solicitation sent by the Contractor to each MBE and WBE and the name and address of each MBE and WBE to whom the solicitation was made.
 - 3) The name and address of each MBE and WBE that performs any portion of the Contractor's Work, a description of such portion of the Work and the dollar

INFORMATION FOR BIDDERS

amount therefore.

- 4) A statement that the Contractor reviewed a list of MBE and WBE contractors in their outreach efforts. A list can be found at www.westchestergov.com/mwob.
- 5) Indicate those MBE and WBE contractors found on the list that provided the type of subcontractor services required for this project. If none were found, please indicate.
- 6) Describe other outreach efforts, including other MBE and/or WBE lists, organizations or individuals that were contacted.

The failure of the low bidder to comply with the provisions of this subparagraph F may result in the County NOT awarding this contract to your firm. Failure of the Contractor to comply with the provisions of this subparagraph F may constitute a material breach of this Contract. Failure to comply with the Minority Participation Policy may be considered by the County when awarding contracts.

37. SEXUAL HARASSMENT POLICY

- A. As with discrimination involving race, color, religion, age, sexual orientation, disability, and national origin, Westchester County also prohibits sex discrimination, including sexual harassment of its employees in any form. The County will take all steps necessary to prevent and stop the occurrence of sexual harassment in the workplace.
 - 1) **This policy applies to all County employees and all personnel in a contractual relationship with the County.** Depending on the extent of the County's exercise of control, this policy may be applied to the conduct of non-County employees with respect to sexual harassment of County employees in the workplace.
 - 2) This sexual harassment policy includes, but is not limited to, inappropriate forms of behavior described by the Equal Employment Opportunity Commission.
- B. Sexual advances that are not welcome, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitutes sexual harassment when:
 - 1) Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment; -OR-
 - 2) Submission to or rejection of such conduct by an individual is used as the basis for employment decisions, such as promotion, transfer, or termination, affecting such individuals; -OR-
 - 3) Such conduct has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile or offensive working environment.
- C. Sexual harassment refers to behavior that is not welcome, that is personally offensive, that fails to respect the rights of others, that lowers morale and that, therefore, interferes

INFORMATION FOR BIDDERS

with an employee's work performance and effectiveness or creates an intimidating, hostile or offensive working environment.

38. SMOKE-FREE WORKPLACE POLICY

- A. By way of Executive Order No. 5 of 1998 and Local Law 3 of 2003, it is now the policy of the County of Westchester to institute a smoke-free “workplace”.
- B. Every indoor County “workplace”, shall become a smoke-free area. The smoking or carrying of lighted cigarettes, cigars, pipes, or any other tobacco-based products, or products that result in smoke, is hereby banned.
- C. Every indoor County “workplace” shall be covered under this Executive Order, including the County Jail in Valhalla and the Westchester County Center in White Plains. This Executive Order shall not, however, apply to County-owned facilities that are not County “workplaces”, such as employees housing or privately run restaurants on County property (e.g. at the County golf courses).
- D. The Richard J. Daronco County Courthouse shall not, for purposes of this Executive Order, be considered a County “workplace”, and therefore shall not be required to be smoke-free.
- E. This Executive Order is intended to be consistent with, and not modify, any provisions of the New York State Public Health Law.
- F. This Executive Order shall take effect immediately and remain in full force and effect until otherwise superseded or revoked.

39. COUNTY ENERGY EFFICIENT PURCHASING POLICY

- A. By way of Executive Order No. 9 of 2002, it is now the policy of the County of Westchester to institute an Energy Efficient Purchasing Policy.
- B. This policy shall apply to all purchases made by and for the County in accordance with applicable laws, rules and regulations.
- C. Wherever the price is reasonably competitive and the quality adequate for the purpose intended, purchase and utilization of products that meet Energy Star requirements for energy efficiency as determined by the United States Environmental Protection Agency and the United States Department of Energy is hereby recommended.
- D. If the Energy Star label is not available with respect to a particular product, than it is recommended that products in the upper twenty-five percent of energy efficiency as designated by the United States Federal Energy Management Program shall be purchased and utilized if the prices of those products are reasonably competitive and the quality adequate for the purpose intended.

40. RESTRICTION ON USE OF TROPICAL HARDWOODS

- A. The bidder/proposer shall not use or propose to use any tropical hardwoods or tropical hardwood products in any form, except in accordance with State Finance Law § 165 (Use of Tropical Hardwoods), as may be amended from time to time. Pursuant to the

INFORMATION FOR BIDDERS

State Finance Law § 165, any bid/proposal which proposes or calls for the use of any tropical hardwood or wood product in the performance of the contract shall be deemed non-responsive.

41. DISCLOSURE OF RELATIONSHIPS TO COUNTY

- A. The successful bidder is required to complete the form entitled “Required Disclosure of Relationships to County” on Proposal Pages 32-33 before award of the contract.
- B. In the event that any information provided on the completed Proposal Pages entitled “Required Disclosure of Relationships to County” changes during the term of this agreement, the Contractor shall notify the Commissioner in writing within ten (10) days of such event by submitting a revised “Required Disclosure of Relationships to County” form.

42. CONTRACTOR DISCLOSURE STATEMENT

The Contractor and each Major Subcontractor represents that all information provided by the Contractor and Major Subcontractor in the form entitled “Contractor Disclosure Statement” on Proposal Pages 23-31 is in all respects true and correct. In the event the information provided on that document changes during the term of this agreement or for a period of three (3) years after the date that the Contractor and/or the Major Subcontractor receives final payment under this agreement, the Contractor and/or Major Subcontractor shall notify the Commissioner in writing within ten (10) days of such event by submitting a revised “Contractor/Major Subcontractor Disclosure Statement”. Bidders must complete the Required Disclosure of Relationships to County form. The Required Disclosure of Relationships to County form is located on Proposal Pages 32-33.

43. CRIMINAL BACKGROUND INFORMATION

Pursuant to Executive Order 1-2008 and subject to the applicable provisions of New York Correction Law §§ 752 and 753, the County shall have the right to bar the following “Persons Subject to Disclosure” (Persons shall mean individuals or legal entities) from providing work or services to the County or from being on County property:

(a) Consultants, Contractors, Licensees, Lessees of County owned real property, their principals, agents, employees, volunteers or any other person acting on behalf of said Contractor, Consultant, Licensee, or Lessee who is at least sixteen (16) years old, including but not limited to Subconsultants, Subcontractors, Sublessees or Sublicensees who are providing services to the County; and

(b) Any family member or other person, who is at least sixteen (16) years old, residing in the household of a County employee who lives in housing provided by the County located on County property.

If any of the above mentioned Persons Subject to Disclosure has either one of the following:

(a) A conviction of a crime (all felonies and misdemeanors as defined under the New York State Penal Law or the equivalent under Federal law or the laws of any other State);

(b) A pending criminal proceeding for a crime(s) as defined above; or

INFORMATION FOR BIDDERS

(c) A refusal to answer such questions.

Where the following criteria apply:

(a) If any of the Persons Subject to Disclosure providing work or services to the County in relation to a County Contract are not subject to constant monitoring by County staff while performing tasks and/or while such persons are present on County property pursuant to the County Contract; and

(b) If any of the Persons Subject to Disclosure providing work or services to the County, in relation to a County Contract may, in the course of providing those services, have access to sensitive data (for example, Social Security Numbers and other personal/secure data); facilities (secure facilities and/or communication equipment); and/or vulnerable populations (for example, children, seniors and the infirm).

Accordingly, the Contractor is required to review the Instructions found in the instructions and complete “Contractor and all persons subject to Disclosure Certification Forms” located at Forms Pages 11-13 as well as any other applicable criminal disclosure forms (i.e., Forms Pages 14 through 19,” together with Forms Pages 11-13 collectively referred to as “Disclosure Forms”).

However, the following Persons Subject to Disclosure are **exempt** from Executive Order 1-2008: (i) those persons for whom the County has already conducted a background check and issued a security clearance that is in full force and effect; or (ii) those persons for whom another state or federal agency having appropriate jurisdiction has conducted a security and/or background clearance or has implemented other protocols or criteria for this purpose that apply to the subject matter of this Contract that is in full force and effect.

If a Person Subject to Disclosure is exempt from the disclosure described in Executive Order 1-2008 because of either “i” or “ii” above, then the Contractor shall notify the Procuring Officer¹ in the respective Department of its claim of exemption and it shall be the responsibility of the Procuring Officer to verify each exemption. If the Procuring Officer determines that the Contractor is exempt under sections “i” or “ii” above, the Procuring Officer shall confirm same with the Contractor and maintain a written record including all supporting details of the verification of and acknowledgement of said exemption.

If the Procuring Officer determines that the Contractor is not exempt under sections “i” or “ii” above, the Procuring Officer shall notify the Contractor in writing, and the appropriate Disclosure Forms shall be required.

It shall be the Contractor’s duty to disclose and to inquire of each and every Person Subject to Disclosure, whether they have been convicted of a crime or whether they are currently subject to pending criminal charges. It shall be the duty of the Contractor to submit a completed Certification Form “Forms Pages 11-13”annexed hereto as ,” which certifies that the Contractor and every Person Subject to Disclosure has been asked whether they have been convicted of a crime or are currently subject to pending criminal charges.

Should the Contractor or any Person Subject to Disclosure (also referred to as “Person”)

¹ “Procuring Officer” shall mean the head of the department or the individual(s) authorized by the head(s) of the department(s) undertaking the procurement and with respect to those matters delegated to the Bureau of Purchase and Supply pursuant to Section 161.11(a) of the Laws of Westchester County, the Purchasing Agent.

INFORMATION FOR BIDDERS

affirmatively advise that they have been convicted of a crime said Person shall be identified in Forms Page 14 entitled “Names And Titles Of Persons Subject To Disclosure That Answered Yes” to any questions on Forms Pages 11-13 and shall complete Forms Pages 15-16 entitled, “Criminal Background Disclosure Form For Persons Who Have Been Convicted of A Crime.”

Should the Contractor or any Person Subject to Disclosure advise that they are subject to pending criminal charges, said Person shall be identified in Forms Page 14 and shall complete the form annexed hereto as Forms Pages 17-18 entitled, “Criminal Background Disclosure Form For Persons Who Are Subject to Pending Criminal Charges.”

Should the Contractor or any Person Subject to Disclosure refuse to answer whether they have been convicted of a crime or are currently subject to pending criminal charges, the name and title of said Person(s) shall be listed on Forms Page 19 entitled “Persons That refused To Answer”.

It shall be the duty of the Contractor to submit to the Procuring Officer all of the attached applicable Disclosure Forms prior to the commencement of this Contract. It is the responsibility of each Contractor to assure that all of their proposed Subcontractors complete the criminal background and disclosure certification forms and submit the forms to the Procuring Officer before they will be approved to perform work on the contract.

Under no circumstances shall the existence of a language barrier serve as a basis for the waiver of or an exception to this obligation. If the Contractor needs to obtain translation services to fulfill this obligation, it shall be at the sole cost and expense of the Contractor.

The Contractor shall be required to make the same inquiry and forward updated Disclosure Forms to the Procuring Officer regarding additional Persons Subject to Disclosure in connection with this Contract during the term of this Contract. **NO NEW PERSON SUBJECT TO DISCLOSURE SHALL PERFORM WORK OR SERVICES OR ENTER ONTO COUNTY PREMISES UNTIL THE UPDATED DISCLOSURE FORMS ARE FILED WITH THE PROCURING OFFICER.**

THE CONTRACTOR HAS A CONTINUING OBLIGATION TO MAINTAIN THE ACCURACY OF THE DISCLOSURE FORMS FOR THE DURATION OF THIS CONTRACT, INCLUDING ANY AMENDMENTS OR EXTENSIONS THERETO AND SHALL PROVIDE ANY UPDATES TO THE PROCURING OFFICER AS NECESSARY TO COMPLY WITH THE DISCLOSURE REQUIREMENTS BY EXECUTIVE ORDER 1-2008.

Any failure by the Contractor to comply with the disclosure requirements of Executive Order 1-2008, absent proof of exemption deemed satisfactory by the County Procuring Officer, may be considered by the County, a material breach by the Contractor and may be grounds for immediate termination of this Agreement by the County.

44. MANDATORY OSHA CONSTRUCTION SAFETY AND HEALTH TRAINING

Pursuant to NYS Labor Law §220-h – On all public work projects of at least \$250,000 all laborers, workers and mechanics employed, in the performance of the contract on the public work site, either by the contractor, sub-contractor or other person doing or contracting to do the

INFORMATION FOR BIDDERS

whole or a part of the work contemplated by the contract, are required to be certified as having successfully completed an OSHA construction safety and health course of at least 10 hours prior to performing any work on the project.



3. GENERAL CLAUSES

DEPARTMENT OF PUBLIC WORKS

Division of Engineering

GENERAL CLAUSES

1. MATERIAL AND WORKMANSHIP

It is the intent of these specifications to require first-class work and new and best quality materials. For any unexpected features arising during the progress of the work and not fully covered herein the specifications shall be interpreted to require first-class work and materials, and such interpretations shall be binding upon the Contractor.

- 1) Upon award of the Contract, the Contractor shall furnish in writing to the Construction Administrator the sources of supply for concrete, and other materials that it proposes to use in the work, and material shall not be furnished from other sources of supply except after written approval by the Construction Administrator. The Contractor shall, before ordering equipment verify that Suppliers of equipment will provide the required warranties, guarantees, and maintenance services.

2. DEFINITIONS

COMMISSIONER - The head of the Department of Public Works of the County of Westchester.

CONSTRUCTION ADMINISTRATOR- The representative of the Commissioner of Public Works at the project site who, unless specifically designated otherwise in the Contract, shall in the first instance, make such determinations as are necessary for the expeditious completion of the Work, except for those determinations that are reserved to the Commissioner.

CONTRACT - Shall mean each of the various parts of these documents both as a whole or severally and except for titles, subtitles, headings and table of contents, shall include the Notice to Bidders, Information for Bidders, the Proposal, the Specifications, the Performance Bond, the Plans, the Contract Form, and all addenda and provisions required by law.

CONTRACTOR - Party of the second part to the Contract acting directly or through its agents, subcontractors, or employees, and who is responsible for all debts pertaining to and for the acceptable performance of the work for which it had contracted.

COUNTY - Party of the first part to the Contract as represented by the Board of Acquisition and Contract and the Commissioner of Public Works for the County of Westchester.

ENGINEER - An Engineer or Architect that designed the project and is serving as the duly authorized representative of the Commissioner of Public Works who, in addition to the duties set forth in the Contract, shall, in the first instance, make such determinations as are necessary to ensure the Contractor's compliance with its obligations for the preparation and submission of shop drawings and all other submittals required for the Work. If there is no Engineer the duties of the Engineer shall be performed by the Construction Administrator and all references in this

GENERAL CLAUSES

Agreement to the Engineer shall be deemed to mean the Construction Administrator.

MAJOR SUBCONTRACTOR- Subcontractors performing all or a portion of the work for Electrical; Heating, Ventilating and Air Conditioning; Fire Prevention; General Construction; and/or any Subcontractor whose subcontract price is equal to or greater than ten percent (10%) of the Contract Price.

OWNER - The County of Westchester.

PLANS - All official drawings or reproductions of drawings pertaining to the work or to any structure connected therewith.

SPECIFICATIONS - The body of directions, requirements, etc. contained in this present volume, together with all documents of any descriptions and agreements made (or to be made), pertaining to the methods(or manner) of performing the work or to the quantities and quality. Specifications shall also include the Notice to Contractors, Instructions to Bidders, Bond, Proposal and Contract Agreement.

SURETY - The corporate body, which is bound with and for the Contractor and which engages to be responsible for the faithful performance of the contract, and to indemnify the County against all claims for damages.

A.A.S.H.O. - American Association of State Highway Officials

A.R.E.A. - American Railway Engineering Association

A.S.T.M. - American Society for Testing Materials

A.W.W.A. - American Water Works Association

N.E.C. - National Electrical Code

N.E.M.A. - National Electric Manufacturers Association

3. BOUNDARIES OF WORK

The County will provide land or rights-of-way for the work specified in this Contract. Other contractors, employees or concessionaires of the county, may for all necessary purposes enter upon the work and premises used by the Contractor, and the Contractor shall give to other contractors and employees of the County all reasonable facilities and assistance for the completion of adjoining work.

4. OVERLAPPING WORK

The Contractor shall take notice that because of work on other contracts within and adjacent to the contract limits it may not have exclusive occupancy of the territory within or adjacent

GENERAL CLAUSES

to the contract limits, and that during the life of this contract the owners and operators of Public Utilities may make changes in their facilities.

The said changes may be made by utility employees or by contract within or adjacent to the contract limits and may be both temporary and permanent.

The Contractor shall cooperate with other Contractors and owners of various utilities and shall coordinate and arrange the sequence of its work to conform with the progressive operations of work already or to be put under contract. Cooperation with Contractors already or to be engaged upon the site is essential to properly coordinate the construction efforts of all Contractors, Utility Owners and Subcontractors engaged in work within and adjacent to the contract limits.

The Contractor shall coordinate the work of its various Subcontractors. Their respective operations shall be arranged and conducted so that delays are avoided. Where the work of the Contractor or Subcontractor overlaps or dovetails with that of other Contractors, materials shall be delivered and operations conducted so as to carry on the work continuously in an efficient and workmanlike manner. The Contractor shall coordinate its work to be done hereunder with the work of the other Contractor(s) and the Contractor shall fully cooperate with such other Contractor(s) and carefully fit its own work to that provided under other contracts as may be directed by the Construction Administrator. If the Construction Administrator shall determine that the Contractor is failing to coordinate its work with the work of the other Contractor(s) as the Construction Administrator has directed, then the Commissioner shall have the right, at its sole option, to withhold any payments otherwise due hereunder until the Construction Administrator's directions are complied with by the Contractor and/or deduct the costs incurred by the County due to the Contractor's failure or refusal to so cooperate. Delays or oversights on the part of the Contractor or Subcontractors or Utility Owners in performing their work in the proper manner thereby causing cutting, removing and replacing work already in place, shall not be the basis for a claim for extra compensation.

In the event of interference between operations of Utility Owners and other Contractors, or among the Contractors themselves, the Construction Administrator shall be the sole judge of the rights of each Contractor insofar as the sequence of work necessary to expedite the completion of the entire project, and in all cases its decision shall be final. The Contractor agrees that it has included in its unit prices bid for the various items of the contract the possible additional cost of performing the work under this contract because it may not have a clear site for its work and because of possible interference of roadway use, other Contractors and necessary utility work, and the necessity or desirability of opening certain sections of pavement to traffic before the entire work is completed. The County shall not be liable for any damages suffered by any Contractor by reason of another Contractor's failure to comply with the directions of the Construction Administrator, or by reason of another Contractor's default in performance or by any act or failure to act of any Utility Owner or anyone working on its behalf, it being understood that the County does not guarantee the responsibility or continued efficiency of any Contractor or Utility Owner and under no circumstances shall the County be liable to any Contractor or Utility Owner for any delays, interferences or any other impediment or hindrance to the Contractor's or Utility Owner's work .

GENERAL CLAUSES

Should the Contractor sustain any damage through any act or omission of any other contractor having a Contract with the County for the performance of work upon the site or of work which may be necessary to be performed for the proper prosecution of the work to be performed hereunder, or through any act or omission of a supplier or subcontractor of whatever tier of such contractor, the Contractor shall have no claim against the County for such damage, but shall have a right to recover such damage from the other contractor under the provision similar to the following provision that has been or will be inserted in the Contracts with such other contractors.

Should any other Contractor having or who shall hereafter have a Contract with the County for the performance of work upon the site sustain any damage through any act or omission of the Contractor hereunder or through the act or omission of any subcontractor of whatever tier of the Contractor, the Contractor agrees to reimburse such other Contractor for all such damages and to defend at his own expense any suit based upon such claim and if any judgment or claims against the County shall be allowed the Contractor shall pay or satisfy such judgment or claim and pay all costs and expenses, including attorney's fees, incurred by the County in connection therewith and to indemnify and hold the County harmless from all such claims.

The County's right to indemnification hereunder shall not be diminished or waived by its assessment against the Contractor of liquidated damages as may be provided elsewhere herein.

Delays in availability of any part of the site or any delays due to interference between the several Contractors and the Utility Owners shall be compensated for by the Construction Administrator solely through granting an extension of time in which to complete the work of the contract without assessment of Engineering charges. The Contractor in submitting its bid hereby agrees that it shall make no other claim against the County for any damages due to such delays or interference.

5. PROPER METHOD OF WORK AND PROPER MATERIALS

The Construction Administrator shall have the power in general to direct the order and sequence of the work, which will be such as to permit the entire work under this contract to be begun and to proceed as rapidly as possible, and such as to bring the several parts of the work to a successful completion at about the same time.

If at any time before the commencement or during the progress of the work the materials and appliances used or to be used appear to the Construction Administrator as insufficient or improper for securing the quality of work required, or the required rate of progress, he may order the Contractor to increase their efficiency or to improve their character, and the Contractor shall promptly conform to such order; but the failure of the Construction Administrator to demand any increase of such efficiency or improvement shall not release the Contractor from its obligation to secure the quality of work or the rate of progress specified.

GENERAL CLAUSES

6. CONTROL OF AREA

Unloading of materials and parking of equipment shall be subject to the orders of the Construction Administrator so far as he may find necessary for the protection and safety of the traveling public and the preservation of property.

7. PERMITS, FEES, ETC.

The County will obtain at its sole cost the necessary New York State Pollutant Discharge Elimination System (“SPDES”) Permit and will sign the associated Notice of Intent (“NOI”). The Contractor and its subcontractors will sign the required Certification Statement (a copy of which is contained as Proposal Page) when it signs the contract.

All necessary permits from County, State or other concerned Public Authorities shall be secured at the cost and expense of the Contractor. It shall also give all notices required by law, ordinance, or the rules and regulations of the concerned Public Bureaus or Departments, and also as a part of the Contract, comply without extra charge or compensation with all State Laws and all other Ordinances or Regulations that may be applicable to this work. Contractor, however, shall first notify the Commissioner before proceeding with securing of all necessary permits and the giving of required notices.

8. TRAFFIC

The General Contractor shall be responsible for the Maintenance and Protection of traffic at all times until the date of completion and acceptance of its work.

During the whole course of the work the Contractor shall so conduct its work and operations so as to interfere with traffic passing the work as little as possible and effect by every reasonable means the safety and comfort of pedestrians, vehicles and vehicle passengers passing the work.

9. INSPECTION

The Contractor shall at all times provide convenient access and safe and proper facilities for the inspection of all parts of the work. No work, except such shop work as may be so permitted, shall be done except in the presence of the Construction Administrator or his/her assistants. No material of any kind shall be used upon the work until it has been inspected and accepted by the Construction Administrator. All materials rejected shall be immediately removed from the work and not again offered for inspection. Any materials or workmanship found at any time to be defective shall be remedied at once, regardless of previous inspection. The inspection and supervision of the work by the Construction Administrator is intended to aid the Contractor in supplying labor and materials in accordance with the specifications, but such inspection shall not operate to release the Contractor from any of its contract obligations.

10. STOPPING WORK

The Commissioner, Construction Administrator or Engineer may stop by written order any work or any part of the work under this contract if, in his/her opinion, the methods employed

GENERAL CLAUSES

or conditions are such that unsatisfactory work might result. When work is so stopped it shall not be resumed until the methods or conditions are revised to the satisfaction of the Commissioner, which must be signified in writing. The Contractor agrees to make no claim for increased costs arising from the issuance of any stop work order.

11. DIMENSIONS

Figured dimensions on the plans shall be given preference over scaled dimensions, but shall be checked by the Contractor before starting construction. Any errors, omissions or discrepancies shall be brought to the attention of the Engineer and his/her decision thereon shall be final.

12. PAYMENTS TO COUNTY

Wherever in the Contract Documents the Contractor is required to make a payment to the County, the Contractor agrees that the County has the option to withhold such sum(s) from payments otherwise due to the Contractor and that all such sums withheld shall be deemed not to be earned by the Contractor.

13. PROTECTION OF UTILITIES AND STRUCTURES

The Contractor shall be responsible for the preservation of all public and private underground and surface utilities/structures at or adjacent to the construction work; insofar as they may be endangered by the work. This shall hold true whether or not they are shown on the contract drawings. If they are shown on the drawings, the County does not guarantee their locations even though the information will be from the best available sources.

The Contractor shall give ample and reasonable notice to all private, corporate or municipal owners before work is done near their utility or structure; shall properly protect all utilities/structures encountered; shall at their expense repair/replace any items that are damaged; and shall proceed with caution to prevent undue interruptions to utility services.

Investigation and/or on-site mark-out, by the County, must be done prior to excavation work at the Valhalla Campus. This investigation/mark-out is to serve as a guide for the Contractor and does not absolve the Contractor from the responsibility to repair/replace identified or non-identified utilities/structures, at no cost to the County.

All excavation work performed at the Valhalla Campus requires the submission of a completed "Ground Penetration" form/sketch(es) will be distributed to the appropriate utility owners. Therefore, the Contractor should assume that no excavation work can be performed until approximately twenty (20) working days after submission of the form/sketch(es), but not prior to approval by the DPW-BO Superintendent of Buildings.

14. PROTECTION OF WATER RESOURCES & THE ENVIRONMENT

The Contractor is responsible to review the specifications and drawings as they relate to this Agreement to ascertain what procedures must be followed in order to comply with all applicable stormwater management, water quality control, erosion, and sediment control

GENERAL CLAUSES

laws, rules, regulations and permits. If the Contractor is of the opinion that any work required, necessitated, or contained in the specifications or otherwise ordered conflicts with the applicable stormwater management, water quality control, erosion, and sediment control laws, rules, regulations, procedures, and permits, including, without limitation, all applicable provisions of the New York State Stormwater Management Design Manual, and the New York Standards and Specifications for Erosion and Sediment Control as they may be amended from time to time, it must promptly notify the First Deputy Commissioner of the Department of Public Works in writing.

In addition to all other requirements contained in this Agreement, the Contractor recognizes and understands that it is an essential element of this Agreement that the Contractor complies with the County's policies to protect water resources and the environment. The Contractor must comply with all applicable stormwater management, water quality control, erosion, and sediment control laws, rules, regulations, permits, procedures and specifications, including, without limitation, all applicable provisions of the New York State Stormwater Management Design Manual,¹ the New York Standards and Specifications for Erosion and Sediment Control as they may be amended from time to time. All of these documents should be obtained from the New York State Department of Environmental Conservation to ensure that the Contractor has the latest version. It should be noted that the standards set forth in the New York State Stormwater Management Design Manual, and the New York Standards and Specifications for Erosion and Sediment Control apply to ALL work done for the County, regardless of the size of the project. In case of a conflict among the governmental regulations and standards, the most stringent regulation, standard or recommendation shall apply to the work done under this Agreement.

The Contractor and its subcontractors shall execute the required Stormwater Pollution Prevention Certification, which is located at Proposal Page 20. In addition, the Contractor acknowledges that if the work required under this Agreement requires that a State Pollutant Discharge Elimination System ("SPDES") permit be obtained from the New York State Department of Environmental Conservation, then the Contractor must comply with the terms and conditions of the SPDES permit for stormwater discharges from construction activities and the Contractor will not take any action or fail to take any necessary action that will result in the County being held to be in violation of said permit or any other permit. The Contractor shall cooperate with the County in obtaining the permit and comply with the SPDES permit and all other applicable laws, rules, regulations and permits.

The Contractor shall provide, as the Commissioner or his designee may request, proof of compliance with the County's policies to protect water resources and the environment, and all applicable stormwater management, water quality control, erosion and sediment control laws, rules, regulations, permits, procedures and specifications.

The Contractor is responsible to ascertain which of the laws, rules, regulations, permits and standards referenced above affect its construction activities, and the Contractor shall be solely responsible for all costs and expenses, including any penalties or fines, incurred by the County, due to the Contractor's failure to comply with such applicable laws, rules,

¹ available at <http://www.dec.state.ny.us/website/dow/swmanual/swmanual.html> - The location of this reference is provided to assist the Contractor; it does not relieve the Contractor from the obligation of obtaining and complying with the latest version of the document.

GENERAL CLAUSES

permits, regulations, standards and County policies. The Contractor shall be responsible to defend and indemnify the County from any and all claims resulting from the Contractor's failure to comply with the applicable laws, rules, regulations, permits, standards and County policies.

Failure of the Contractor to comply with the County's policies to protect water resources and the environment, and all applicable stormwater management, water quality control, erosion and sediment control laws, rules, regulations, permits, procedures and specifications may result in the withholding of progress payments to the Contractor by the County. Such withholding of progress payments shall not relieve the Contractor of any requirements of the Agreement including the completion of the work within the specified time, and any construction sequence requirement of the Agreement.

The Contractor acknowledges that its failure to comply with the County's policies to protect water resources and the environment, and all applicable stormwater management, water quality control, erosion and sediment control laws, rules, regulations, permits, procedures and specifications shall constitute a material breach under this contract. For the breach or violation of this provision, without limiting any other rights or remedies to which the County may be entitled, the County shall have the right, in its sole discretion to suspend, discontinue or terminate this Agreement immediately upon notice to the Contractor. In such event, the Contractor shall be liable to the County for any additional costs incurred by the County in the completion of the project.

The failure of the Contractor to comply with these requirements could lead to a determination that the Contractor is not a responsible bidder when the Contractor is bidding on other projects.

15. SANITARY REGULATIONS

The Contractor shall obey and enforce such sanitary regulations and orders and shall take such precautions against infectious diseases as may be deemed necessary. The building of shanties or other structures for housing the men, tools, machinery or supplies will be permitted only at approved places, and the sanitary condition of the grounds in and at such shanties or other structures must be at all times maintained in a satisfactory manner.

16. CLEANING UP

Upon completion of the work, the Contractor shall remove all equipment, rubbish, debris and surplus materials from the buildings, and grounds, and provide a suitable dumping place for such materials. The premises shall be left in a neat, clean and acceptable condition.

No litter, debris of any kind shall be allowed to accumulate for more than one day in any portion of the buildings or grounds, and must be removed from the area at the end of each workday.

17. PREVENTION OF DUST HAZARD

In accordance with the New York State Labor Law, Section 22a, in the event a silica or other harmful dust hazard is created due to construction operations under the contract, the Contractor shall install, maintain and keep in effective operation the appliances and methods

GENERAL CLAUSES

for the elimination of such silica dust or other harmful dust as have been recommended and approved by State and local authorities.

18. REPRESENTATIVE ALWAYS PRESENT

The Contractor in case of its absence from the work shall have a competent representative **fluent in English** or foreman present, who shall obey without delay, all instructions of the Construction Administrator in the prosecution and completion of the work in conformity with this contract, and shall have full authority to supply labor and material immediately.

19. WORK IN BAD WEATHER

During freezing, stormy or inclement weather, no work shall be done except such as can be done satisfactorily and in a manner to secure first-class construction throughout.

20. PROTECTION OF WORK UNTIL COMPLETION

The Contractor shall be responsible for the protection and maintenance of its work until the same has been accepted by the Owner and shall make good any damage to the work caused by floods, storms, settlements, accidents, or acts of negligence by its employees or others so that the complete work when turned over to the Owner will be in first-class condition and in accordance with the plans and specifications.

21. REMOVAL OF TEMPORARY STRUCTURES AND CLEANING UP

On or before the completion of the work the Contractor shall, without charge therefore, tear down and remove all buildings and other structures built by him for facilitating the carrying out of the work, shall remove all rubbish of all kinds from the grounds which he has occupied, shall do any small amount of additional trimming and grading and shall leave the entire work and premises clean, neat and in good condition. The Contractor shall provide at its own expense suitable dumping places for such material. When the necessity for protecting traffic ends, the Contractor shall remove all signs, lighting devices, barricades and temporary railings from the site of the work.

22. GROSS LOADS HAULED ON HIGHWAY

The Contractor shall at no time during the construction of this contract, haul gross loads exceeding the legal limit prescribed by the Highway Law over the highways of access to, or the highway included in this contract.

23. CONCRETE BATCH PROPORTIONS - YIELD

No Construction Administrator or Engineer is authorized to instruct or inform the Contractor, or any of its agents or employees, or its concrete supplier as to the weights of the ingredients to be used to produce a cubic yard of concrete or as to the yield to be used to produce a cubic yard of concrete or as to the yield to be expected from any batch. The Contractor shall make its own determination and give its own instructions to its agents, employees and concrete supplier as to the total quantity of ingredients to be purchased as a

GENERAL CLAUSES

cubic yard of concrete. The right is reserved to the Construction Administrator and Engineer, however, to verify yields after batch weights have been established by the Contractor and to order a reduction in total weight per load in the event his/her calculations show that the rated capacity of truck mixers, if approved for use, will be exceeded.

24. DAMAGE DUE TO CONTRACTOR'S OPERATIONS

In the event that damage is caused to structures, surfacing, pavement, shrubbery, trees or to grassed areas through trucking operations, delivery of materials, the actual performance of the work, or other causes, the Contractor shall fully restore the same to their original condition at its own expense. In the event that more than one contractor causes damages to any one area, the Director of Project Management will apportion the amount of repair work to be done by each contractor. The decision of the Director of Project Management shall be final and binding upon the Contractor(s) and may not be challenged except pursuant to a proceeding brought pursuant to Article 78 of the Civil Practice Law and Rules.

25. PROPERTY DAMAGE

The Contractor shall not enter upon nor make use of any private property along the line of work except when written permission is secured from the owner of that property. In case of any damage or injury done along the line of work in consequence of any act or omission on the part of the Contractor, or any one in its employ, in carrying out the contract, the Contractor shall at its own expense restore the same or make repairs as are necessary in consequence thereof in a manner satisfactory to the owner of the affected property; provided, however, that the obligation thus assumed by the Contractor shall not inure directly or indirectly to the benefit of any insurer of physical damage to property or loss of use, rents or profits of property regardless of whether the insurer has actually paid the claim or made only a loan to its insured, nor to the latter if it shall waive or abandon any claim against its insurer or insurers.

In case of failure on the part of the Contractor to restore or repair such property in a manner satisfactory to the owner of the affected property, the party of the first part may upon forty-eight hours notice to the Contractor proceed with such restoration or repair. The expense of such restoration or repair shall be deducted from any monies, which are due or may become due the Contractor under its contract. The Construction Administrator shall be the sole judge as to what constitutes failure to restore or repair as above stated and service of notice by mail addressed to the Contractor at the address stated in the proposal shall be sufficient.

26. CLAIMS FOR DAMAGES

The Contractor agrees that it will make no claim against the County or any of its representatives for damages for delay, interference or disruption of any kind in the performance of its Contract and further agrees that any such claim arising from acts or failure to act of the County or any of its representatives shall be fully and exclusively compensated for by an extension of time to complete the performance of the work as provided herein.

GENERAL CLAUSES

27. EXTENSIONS OF TIME

An extension or extensions of time may be granted only by the Commissioner and only upon a verified application therefore by the Contractor. Each application for an extension of time must set forth in detail the nature of each cause of delay in the completion of the work, the date upon which each such cause of delay began and ended, and the number of days attributable to each of such causes. If the schedule for this project is based upon the Critical Path Method, the Contractor must also demonstrate that the delay for which an extension of time is sought occurred on the critical path. A formal written notice of the Contractor's intent to apply for an extension of time must be submitted to the Commissioner within seven (7) calendar days of the start of the alleged delay. The formal application for the extension of time must be submitted to the Commissioner no later than ten (10) calendar days after the end of the delay, but in no event later than the Contractor's submittal of its application for its substantial completion payment. The failure of the Contractor to timely submit either its formal written notice of its intent to apply for an extension of time or the application thereof shall be deemed a waiver of any entitlement to any extension of time.

The Contractor shall be entitled to an extension of time for delay in completion of the work caused solely (1) by the acts or omissions of the County, its officers, agents or employees; or (2) by the acts or omissions of other Contractors on this project; or (3) by supervening conditions entirely beyond the control of either party hereto (such as, but not limited to, Acts of God, excessive inclement weather, war, or any other national emergency making performance temporarily impossible or illegal, or strikes or labor disputes not brought about by any act or omission of the Contractor).

The Contractor shall not be entitled to receive a separate extension of time for each of several causes of delay operating concurrently, but, if at all, only for the actual period of delay in completion of the work as determined by the Engineer or Commissioner. If one of multiple causes of delay operating concurrently results from any act or omission of the Contractor or of its subcontractors of whatever tier, and would of itself (irrespective of concurrent causes) have delayed the work, no extension of time will be allowed for the period of delay resulting from such act or omission and the Contractor shall re-arrange his Progress Schedule and operations so as to complete the Work within the time set forth in the Contract and minimize the impact of the Work on the other Prime Contractors.

The determination made by the Commissioner or Engineer on an application for an extension of time shall be binding and conclusive on the Contractor and may not be challenged except in a proceeding commenced pursuant to Article 78 of the Civil Practice Law and Rules.

Permitting the Contractor to continue with the work after the time fixed for its completion has expired, or after the time to which such completion may have been extended has expired, or the making of any payment to the Contractor after such time, shall not operate as waiver on the part of the County of any of its rights or remedies under this contract nor shall it relieve the Contractor from his obligation under the Contract, including without limitations its liability to the County for liquidated damages, engineering costs, delays, damages, and/or costs incurred by the County.

If the Commissioner deems it advisable and expedient to have the Contractor complete and furnish the Work after the expiration of the time of Completion of Work (see "Required

GENERAL CLAUSES

Time For Completion Of The Work” of the General Requirements) and in order that the County’s fiscal officers may be permitted to make payment to the Contractor for Work performed beyond that date, the Commissioner may extend the Contract solely for the purpose of enabling the Contractor to be paid for Work performed. This extension shall in no way relieve the Contractor from his obligation under the Contract, including without limitations its liability to the County for liquidated damages, engineering costs, delays, damages, attorney’s fees and/or costs incurred by the County, nor shall such extension of time be asserted by the Contractor in any action or proceeding as evidence that it completed its work in a timely manner.

The time necessary for review by the Engineer of all submittals including vendors, shop drawings, substitutions, etc., and delays incurred by normal seasonal and weather conditions should be anticipated and is neither compensatory nor eligible for Extensions of Time.

When the Work embraced in the Contract is not completed on or before the date specified herein, engineering and inspection expenses incurred by the County of Westchester upon the Work from the completion date originally fixed in the Contract to the final date of completion of the Work may be charged to the Contract and be deducted from the final monies due the Contractor.

28. REQUEST FOR APPROVAL OF EQUAL

A. GENERAL REQUIREMENTS

Wherever in the Contract Documents an article, material, apparatus, product or process is called for by trade name or catalog reference, or by the name of the patentee, manufacturer or dealer, it is understood that it constitutes the standard requirement to meet the contract specifications. Where two or more articles, materials, apparatus, products or processes are listed as acceptable by reference to trade name or otherwise, the choice of these will be optional to the bidder.

Bidders may base their bid on one of the specified items, or they may base their bid on an “equal”. However, the bidder should be aware that the County makes the final determination as to what constitutes an equal.

If the Engineer shall reject the proposed equal as not being the equal of that specifically named in the contract, the successful bidder (Contractor) shall immediately proceed to furnish the designated article, material, apparatus, product or process as specified or an approved equal without additional cost or time delay to the County.

B. REVIEW PROCESS

- 1) Within fifteen (15) days from the Notice to Proceed, requests for approval of equals must be proposed to the Commissioner on the “Request For Approval Of Equal” form of the Sample Forms. This Period for submitting requests will be strictly enforced. Such requests shall conform to the requirements of this Article.
- 2) Requests for approval of equals will be received and considered from Prime Contractors only and not from manufacturers, suppliers, Subcontractors, or other third parties.
- 3) If the materials and equipment submitted are offered as equals to the Contract

GENERAL CLAUSES

Documents the Contractor shall advise the County and the Engineer of the requested equal and comply with the requirements hereinafter specified in this Article.

- 4) Where the acceptability of an equal is conditioned upon a record of satisfactory operation and the proposed equal does not fulfill this requirement, the Engineer, at his/her sole discretion, may accept the equal if the Contractor provides a bond or cash deposit which guarantees replacement at no cost to the County for any failure occurring within the specified time. The equal item must meet all other technical requirements contained in the Specification.
- 5) The successful bidder shall furnish such information as required by the Engineer to demonstrate that the equal article, material, apparatus, product or process is the equal of that specified in quality, finish, design, efficiency and durability and has been elsewhere demonstrated to be equally serviceable for the purpose for which it is intended. The Contractor shall set forth the reasons for desiring to utilize the proposed equal.
- 6) Contractor shall submit:
 - a. For each proposed request for approved equal sufficient details, complete descriptive literature and performance data together with samples of the materials, where feasible, to enable the Engineer to determine if the proposed request for approved equal is equal, including manufacturer's brand or trade names, model numbers, description of specification of item, performance data, test reports, samples, history of service, and other data as applicable.
 - b. Certified tests, where applicable, by an independent laboratory attesting that the proposed equal is equal.
 - c. A list of installations where the proposed equal equipment or materials is performing under similar conditions as specified.
- 7) Requests for approval of equal after the period set forth in B. REVIEW PROCESS, Paragraph 1, above will not be accepted for evaluation except in case of strikes, discontinuance of manufacturer or other reason deemed valid by the Engineer whereby the specified products or those approved are unattainable. In such case the Contractor shall provide substantial proof that the acceptable products are unavailable.
- 8) Where the approval of an equal requires revision or redesign of any part of Work, including that of other Contracts, all such revision and redesign, and all new drawings and details required therefore, shall be provided by the Contractor at its own cost and expense, and shall be subject to the approval of the Commissioner.
- 9) In the event that the Engineer is required to provide additional engineering services, then the engineer's charges for such additional services shall be promptly paid by the Contractor to the County.
- 10) Any modifications in the Work required under other Contracts to accommodate the changed design will be incorporated in the appropriate Contracts and any resulting increases in Contract prices will be paid by the Contractor who initiated the

GENERAL CLAUSES

changed design to the County.

- 11) In all cases the Engineer shall be the judge as to whether a proposed equal is to be approved. The Contractor shall abide by his/her decision when proposed equal items are judged to be unacceptable and shall in such instances furnish the item specified or indicated. No equal items shall be used in the Work without written approval of the Engineer.
- 12) In making request for approval of equal, Contractor represents that:
 - a. Contractor has investigated proposed equal, and determined that it is equal to or superior in all respects to the product, manufacturer or method specified.
 - b. Contractor will provide the same or better warranties or bonds for proposed equal as for product, manufacturer or method specified.
 - c. Contractor waives all claims for additional costs or extension of time related to proposed equal that subsequently may become apparent.
 - d. Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Engineer in considering an equal proposed by the Contractor or by reason of refusal of the Engineer to approve an equal proposed by the Contractor. Any delays arising out of consideration, approval, or utilization of an equal shall be the sole responsibility of the Contractor requesting the equal and it shall arrange its operations to make up the time lost.
- 13) Proposed Equal Will Not Be Accepted If:
 - a. Acceptance will require substantial revision of Contract Documents.
 - b. They will change design concepts or Technical Specifications.
 - c. They will delay completion of the Work, or the Work of other Contractors.
 - d. They are indicated or implied on a Shop Drawing and are not accompanied by a formal request for approval of equal from Contractor.
- 14) Only those products originally specified and/or added by approved requests for equals submitted in accordance with the preceding paragraphs may be used in the Work. Whenever requests for equals are approved, it shall be understood that such approval is conditional upon strict conformance with all requirements of the Contract and further subject to the following:
 - a. Any material or article submitted for approval in accordance with the above procedure must be equal, in the sole opinion of the Engineer, to the material or article specified. It must be readily available in sufficient quantity to prevent delay of any Work; it must be available in an equivalent color, texture, dimension, gauge, type and finish as to the item or article specified; it must be equal to the specified item in strength, durability, efficiency, serviceability, compatibility with existing systems, ease and cost of maintenance; it must be compatible with the design and not necessitate substantial design modifications; it must be equal in warranties and guarantees; its use must not impose substantial additional Work, or require substantial changes in the Work of any

GENERAL CLAUSES

- other Contractor. Availability of spare parts shall be assured for the useful life of the Project.
- b. The Engineer reserves the right to disapprove, for aesthetic reasons, any material or equipment on the basis of design or color considerations alone, without prejudice to the quality of the material or equipment, if the manufacturer cannot meet the required colors or design.
 - c. All requests for approval of equals of materials or other changes from the contract requirements shall be accompanied by an itemized list of all other items affected. The Engineer shall have the right, if such is not done, to rescind any approvals for equals or changes and to order such Work removed and replaced with Work conforming to the specified requirements of the contract, all at the Contractor's expense, or to assess all additional costs resulting from the equal to the Contractor.
- 15) Approval of an equal will not relieve Contractor from the requirement to submit Shop Drawings or any of the provisions of the Contract Documents.
- 16) In the event that the Engineer is required to provide additional engineering services as a result of a request for approval of an equal of materials or equipment which are not "or equal" by the Contractor, or changes by the Contractor in dimension, weight, power requirements, etc., of the equipment and accessories furnished, or as a result of Contractor's errors, omissions or failure to conform to the requirements of the Contract Documents or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, or for evaluation of deviations from Contract Documents, then the Engineer's charges in connection with such additional services shall be paid by the Contractor to the County.
- 17) The Contractor shall respond to required submittals with complete information and with a degree of accuracy to achieve approvals within three (3) submissions. All costs to the Engineer involved with subsequent submissions requiring approval, will be paid by the Contractor to the County.

29. SUBSTITUTION

- A. Should the Contractor desire to substitute other articles, materials, apparatus, products or processes than those specified or approved as equal, the Contractor shall apply to the Engineer in writing for approval of such substitution. It should be noted that the bid shall not be based on a substituted article, material, apparatus, product or process. With the application shall be furnished such information as required by the Engineer to demonstrate that the article, material, apparatus, product or process he wishes to use is the equivalent of that specified in quality, finish, design, efficiency and durability and has been elsewhere demonstrated to be equally serviceable for the purpose for which it is intended. The Contractor shall set forth the reasons for desiring to make the substitution and shall further state what difference, if any, will be made in the construction schedule and the contract price for such substitution should it be accepted; it being the intent hereunder that any savings shall accrue to the benefit of the County.

GENERAL CLAUSES

- B. If the Engineer shall reject any such desired substitution as not being the equivalent of that specifically named in the contract, or if it shall determine that the adjustment in price in favor of the County is insufficient, the Contractor shall immediately proceed to furnish the designated article, material, apparatus, product or process.
- C. Request for substitutes must be proposed to the Commissioner on the "Request For Approval Of Substitution" form of the Sample Forms. Such requests shall conform to the requirements of this Article.
- D. Requests for substitutions shall include full information concerning differences in cost, and any savings in cost resulting from such substitutions shall be passed on to the County.
- E. Requests for utilization of substitutes will be reviewed during the course of the project. The impact on the project and the timeliness of submission will be of key consideration.
- F. The approval of utilization of a substitute is subject to the sole and final discretion of the Engineer.
- G. REVIEW PROCESS
 - 1) Requests for approval of substitutions will be received and considered from Prime Contractors only and not from manufacturers, suppliers, Subcontractors, or other third parties.
 - 2) If the materials and equipment submitted are offered as substitutions to the Contract Documents or approved equal the Contractor shall advise the County and the Engineer of the requested substitutions and comply with the requirements hereinafter specified in this Article.
 - 3) Where the acceptability of substitution is conditioned upon a record of satisfactory operation and the proposed substitution does not fulfill this requirement, the Engineer, at his/her sole discretion, may accept the substitution if the Contractor provides a bond or cash deposit which guarantees replacement at no cost to the County for any failure occurring within the specified time. The substitution item must meet all other technical requirements contained in the Specification.
 - 4) The Contractor shall furnish such information as required by the Engineer to demonstrate that the equal article, material, apparatus, product or process is the equivalent of that specified in quality, finish, design, efficiency and durability and has been elsewhere demonstrated to be equally serviceable for the purpose for which it is intended and/or that it offers substantial benefits to the County in saving of time and/or cost. The Contractor shall set forth the reasons for desiring to make this substitution.
 - 5) Contractor shall submit:
 - a. For each proposed request for approved substitute sufficient details, complete descriptive literature and performance data together with samples of the materials, where feasible, to enable the Engineer to determine if the proposed request for approval should be granted, including manufacturer's brand or trade names, model numbers, description of specification of item, performance data, test reports, samples, history of service, and other data as applicable.

GENERAL CLAUSES

- b. Certified tests, where applicable, by an independent laboratory attesting to the performance of the substitute.
 - c. A list of installations where the proposed substitute equipment or materials is performing under similar conditions as specified.
- 6) Where the approval of a substitute requires revision or redesign of any part of Work, including that of other Contracts, all such revision and redesign, and all new drawings and details required therefore, shall be provided by the Contractor at its own cost and expense, and shall be subject to the approval of the Engineer.
- 7) In the event that the Engineer is required to provide additional engineering services, then the engineer's charges for such additional services shall be paid by the Contractor to the County.
- 8) Any modifications in the Work required under other contracts to accommodate the changed design will be incorporated in the appropriate contracts and any resulting increases in contract prices will be charged to the Contractor by the County who initiated the changed design.
- 9) In all cases the Engineer shall be the judge as to whether a proposed substitute is to be approved. The Contractor shall be bound by his/her decision. No substitute items shall be used in the Work without written approval of the Engineer.
- 10) In making request for approval of substitute, Contractor represents that:
- a. Contractor has investigated proposed substitute, and determined that it is equal to or superior in all respects to the product, manufacturer or method specified or offers other specified advantages to the County.
 - b. Contractor will provide the same or better warranties or bonds for proposed substitute as for product, manufacturer or method specified.
 - c. Contractor waives all claims for additional costs or extension of time related to proposed substitute that subsequently may become apparent.
 - d. Contractor shall have and make no claim for an extension of time or for damages by reason of the time taken by the Engineer in considering a substitute proposed by the Contractor or by reason of failure of the Engineer to approve a substitute proposed by the Contractor. Any delays arising out of consideration, approval, or utilization of a substitute shall be the sole responsibility of the Contractor requesting the substitute and it shall arrange its operations to make up the time lost.
- 11) Proposed substitute will not be accepted if:
- a. Acceptance will require substantial revision of Contract Documents.
 - b. They will substantially change design concepts or Technical Specifications.
 - c. They will delay completion of the Work, or the Work of other Contractors.
 - d. They are indicated or implied on a Shop Drawing and are not accompanied by a formal request for approval of substitute from Contractor.
- 12) The Engineer reserves the right to disapprove, for aesthetic reasons, any material or

GENERAL CLAUSES

equipment on the basis of design or color considerations alone, without prejudice to the quality of the material or equipment, if the manufacturer cannot meet the required colors or design.

- 13) All requests for approval of substitutes of materials or other changes from the contract requirements, shall be accompanied by an itemized list of all other items affected by such substitution or change. The Engineer shall have the right, if such is not done, to rescind any approvals for substitutions and to order such Work removed and replaced with Work conforming to the specified requirements of the contract, all at the Contractor's expense, or to assess all additional costs resulting from the substitution to the Contractor.
- 14) Approval of a substitute will not relieve Contractor from the requirement to submit Shop Drawings or any of the provisions of the Contract Documents.
- 15) In the event that the Engineer is required to provide additional engineering services as a result of a request for approval of a substitute results in changes by the Contractor in dimension, weight, power requirements, etc., of the equipment and accessories furnished, or as a result of Contractor's errors, omissions or failure to conform to the requirements of the Contract Documents or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the Contractor, or for evaluation of deviations from Contract Documents, then the Engineer's charges in connection with such additional services shall be paid by the Contractor.
- 16) Structural design shown on the Drawing is based upon the configuration of and maximum loading for major items of equipment as indicated on the Drawings and as specified. If the substituted equipment furnished differs from said features, the Contractor shall pay to the County all costs of redesign and for any construction changes required to accommodate the equipment furnished, including the Engineer's charges in connection therewith.
- 17) The Contractor shall respond to required submittals with complete information and with a degree of accuracy to achieve approvals within two (2) submissions. All costs to the Engineer involved with subsequent submissions of Shop Drawings, Samples or other items requiring approval, will be paid by the Contractor to the County, by deducting such costs from payments due for Work completed. In the event an approved item is requested by the Contractor to be changed or substituted for, all costs involved in the reviewing and approval process will likewise be backcharged to the Contractor unless determined by the Engineer that the need for such substitution and/or deviation from Contract Documents is beyond the control of the Contractor.

30. EXTRA WORK: INCREASED COMPENSATION/DECREASED WORK: CREDIT TO THE OWNER

The Director of Project Management may, at any time, by a written order, and without notice to the sureties, require the performance of Extra Work or require or approve changes in the work, or Decreased Work ("work" to include but not be limited to specified methods of performing work) as he may deem necessary or desirable. The amount of compensation

GENERAL CLAUSES

to be paid to the Contractor for any Extra Work, as so ordered, or credit to the Owner for such decreased work, as so ordered or approved, shall be determined as follows:

- 1) **First:** By such applicable unit prices, if any, as set forth in the Contract; or
- 2) **Second:** If no such prices are so set forth, then by unit prices or by a lump sum, or sums, mutually agreed upon by the Director of Project Management and the Contractor; or
- 3) **Third:** If, in the opinion of the Director of Project Management, the aforesaid unit prices, under "First" above, are not applicable, or if the two parties hereto cannot reach agreement as to new unit prices or a lump sum, or sums, under "Second" above, then by the actual net cost in money to the Contractor of the materials and of the wages of applied labor (including cost of supplements provided and premiums for Workmen's Compensation Insurance, FICA, and Federal and State Unemployment Insurance) required for such Extra Work, plus twenty (20%) percent as compensation for all items of profit and costs or expenses including administration, overhead, superintendence, insurance (other than those specifically noted above) materials used in temporary structures, allowances made by the Contractor to subcontractors, including those made for overhead and profit, additional premiums upon the performance bond of the Contractor and the use of small tools and any and all other costs and expenses not enumerated above, plus such rental for plant and equipment (other than small tools) required and approved for such extra work. Where extra work is performed by a Subcontractor, the twenty percent stipulated above shall be divided between the Contractor and the Subcontractor as per their contractual agreement, or if not defined therein, then as the Contractor sees fit.

Rental rates for any power operated machinery, trucks or equipment, which it may be found necessary to use as in "Third" above, shall be reasonable and shall be based on those prevailing in the area of the County where such work is to be done, and they shall be agreed upon in writing before the work is begun.

In no case shall the rental rates submitted exceed the rates set up in the current edition of "Equipment Watch" plus the cost of fuel and lubricants.

These rates shall include all repairs, fuel, lubricants, applicable taxes, insurance, depreciation, storage and all attachments complete, ready to operate, but excluding operators. Operators shall be paid as stated here in above for labor.

For equipment, which is already on the project, the rental period shall start when ordered to work by the Construction Administrator, and shall continue until ordered to discontinue by him. The minimum payment for any one rental period shall be four hours, unless otherwise agreed upon between the Construction Administrator and the Contractor.

For equipment which has to be brought to the project, specifically for use as in "Third" above, the County will pay all loading and unloading costs, also all transportation costs will not be paid, if the equipment is used for work other than in "Third" above while on the project. The rental period shall begin at the time the equipment has been unloaded on the

GENERAL CLAUSES

project, and shall end on and include the day the order to discontinue the use of the equipment as in "Third" above is given to the Contractor by the Construction Administrator.

The daily rate shall apply for rental periods of four calendar days or less, the weekly rate shall apply for rental periods of more than four and not exceeding twenty-one calendar days, and the monthly rate shall apply for rental periods in excess of twenty-one calendar days. For fractional periods above the full unit rental period (day, week, month) reimbursement shall be proportioned on the basis of the applicable rental period. (Day-8 hrs.; Week-7 calendar days; Month-30 calendar days).

No percentage shall be added to the amounts of equipment rental prices agreed upon, but the price agreed upon shall be the total compensation allowed for the use of such equipment.

The provisions hereof shall not affect the power of the Contractor to act in case of emergency.

31. DISPUTED WORK - NOTICE OF CLAIMS FOR DAMAGES

If the Contractor is of the opinion that any work required, necessitated, or ordered violates or conflicts with or is not required by the terms and provisions of this Contract, it must promptly, within five (5) calendar days after being directed to perform such work, notify the Construction Administrator, in writing, of its contentions with respect thereto and request a final determination thereon. If the Construction Administrator determines that the work in question is contract and not extra work, or that the order complained of is proper, he will direct the Contractor in writing to proceed and the Contractor shall promptly comply. In order, however, to preserve its right to claim compensation for such work or damages resulting from such compliance, the Contractor must, within seven (7) calendar days after receiving notice of the Construction Administrator's determination and direction, notify the Construction Administrator, in writing that the work is being performed or that the determination and direction is being complied with, under protest. Failure of the Contractor to so notify shall be deemed as a waiver of claim for extra compensation or damages therefore.

While the Contractor is performing disputed work or complying with a determination or order under protest in accordance with this Article, in each such case the Contractor shall furnish the Construction Administrator daily with three copies of written statements signed by the Contractor's representatives at the site showing:

- 1) the name of each worker employed on such work or engaged in complying with such determination or order, the number of hours employed thereon, and the character of the work each is doing; and
- 2) the nature and quantity of any materials, plant and equipment furnished or used in connection with the performance of such work or compliance with such order, and from whom purchased or rented.

It is expressly agreed that no dispute over the scope of the Contractor's work or any portion thereof shall cause any delay or interruption to the Contractor's work.

In addition to the foregoing statements, the Contractor shall, upon notice from the Board of Acquisition and Contract, produce for examination by the duly appointed representative of

GENERAL CLAUSES

the Board of Acquisition and Contract, all its books of accounts, bills, invoices, payrolls, subcontracts, time books, daily reports, bank deposit books, bank statements, check books and canceled checks, showing all of its acts and transactions in connection with or relating to or arising by reason of this contract, and submit itself, its agents, servants and employees for examination under oath by any duly appointed representative designated by the Board of Acquisition and Contract to investigate claims made against the County. Unless the aforesaid statements shall be made and filed within the time aforesaid and the aforesaid records submitted for examination and the Contractor, its agents, servants, and employees submit themselves for examination as aforesaid, the County shall be released from all claims arising under, relating to or by reason of this contract, except for the sums certified by the Construction Administrator to be due and agreed that no person has power to waive any of the foregoing provisions, and that in any action against the County to recover any sum in excess of the sums certified by the Construction Administrator to be due under or by reason of this contract, the Contractor must allege in its complaint and prove, at the trial, strict compliance with the provisions of this article.

Before final acceptance of the work by the County, all matters of dispute must be adjusted to the mutual satisfaction of the parties thereto. Determinations and decisions in case any question shall arise, shall constitute a condition precedent to the right of the Contractor to receive the money therefore, until the matter in question has been adjusted.

32. CONTRACTOR'S SUBCONTRACTS AND MATERIAL LISTS

Within fifteen (15) days after execution of the Contract, the successful bidder shall submit to the County for approval a list of the subcontractors, materialmen and materials that he/she plans to use in the performance of the work and statements of the work they are to perform. The format and content of the list shall be in accordance with directives from the Construction Administrator. He/sit shall also submit additional information regarding their qualifications as may be later requested by the County. No part of the work may be sublet until after the Contractor has received the County's approval.

The Contractor shall be fully responsible for all acts and omissions of its subcontractors and persons directly or indirectly employed by them, and the County's approval to sublet parts of the work will in no way relieve the Contractor of any of its obligations under the Contract. All dealings of the Construction Administrator with the subcontractors shall be through the Contractor, subcontractors being recognized by the County only as employees of the Contractor.

By executing the Agreement, the Contractor represents that the Contractor shall insert appropriate clauses in all subcontracts to bind the subcontractors to the Contractor by all applicable provisions of the Contract Documents executed between the Contractor and the County, but this shall not be construed as creating any contractual relationships between subcontractors and the County. Prior to approval of the subcontractors, the County has the right to review and recommend changes in the subcontracts. The County reserves the right to reject any subcontractor proposed by the Contractor if in the reasonable opinion of the County such subcontractor lacks the experience, capability or integrity to perform its subcontract work or is otherwise non-responsible.

GENERAL CLAUSES

By executing the Agreement, the Contractor represents that the Contractor shall insert appropriate clauses in each subcontract that require that if the Contractor is terminated by the County either for default or convenience that at the sole option of the County the subcontract shall automatically attach to the County and the subcontractor shall continue without delay or interruption to fully perform all of the obligations required by its subcontract.

Where the specifications permit the Contractor a choice of different materials or manufactured products, it shall state the choice he has made in making up its bid, with the understanding that all choices must subsequently be approved by the Commissioner, after award of the contract to the successful bidder. If the bidder wishes to propose utilization of materials or manufactured products other than those specified, it shall so state and submit the required information in accordance with Article "Request For Approval Of Equal" of the General Clauses."

33. ASSIGNMENT OF CONTRACT

The Contractor shall not assign, transfer, convey or otherwise dispose of the contract or any part of it or any monies due and payable under the contract, without prior written approval of the County. If such approvals are granted by the County, they shall in no way relieve the Contractor or from any obligations under the terms of this Contract.

All documents assigning the contract or any part of it or any monies due and payable under the contract shall contain a clause stating that all monies to be paid the assignee in accordance with the terms of the Contractor's contract with the County, are subject to a prior lien for services rendered or materials and equipment supplied, in favor of all persons, firms or corporations rendering such services or supplying such materials and equipment.

34. PAYMENT FOR GENERAL PROVISIONS

No direct payment will be made for work done or materials furnished in compliance with the General Provisions of the specifications, unless otherwise noted. All compensation to the Contractor for its performance of the requirements of any general provision shall be considered to have been included in the prices he has bid for the individual items if a unit price contract and/or for a lump sum price if a lump sum contract.

In the event the Contractor fails or refuses to proceed with its work and/or correct or repair deficient or defective work then without prejudice to any and all of the County's other rights and remedies, and upon three (3) days notice to Contractor, the County may perform and/or employ any other person or persons to correct and/or repair any or all such work. All costs incurred by the County pertaining thereto shall be paid forthwith by the Contractor to the County.

35. COSTS INCURRED BY COUNTY

Wherever in these Contract Documents the County is entitled to recover costs from the Contractor or charge the Contractor for the costs incurred for the correction, supervision or for any other reason related to the Contractor's work or arising from the Contractor's failure or refusal to proceed with its work in a timely manner, such costs and/or charges shall be

GENERAL CLAUSES

deemed to include, but not be limited to, the County's costs and fees for inspection(s), engineering, consultant(s) and attorneys.

36. GUARANTEE OF WORK

- A. Except as otherwise specified, all work performed under the Contract shall be guaranteed by the Contractor against defects resulting from the use of inferior materials, equipment or workmanship for one year from the guarantee starting date (which shall be defined as the date of the County's approval of the final Certificate for Payment or the date of actual full occupancy of the building, whichever is earlier). The building, section thereof, or item of equipment, shall be occupied or put into actual use by the Owner only after judged completed by the Construction Administrator and Owner and approved by him as ready for occupancy.
- B. If, within any guarantee period, repairs or changes are required in connection with guaranteed work, which in the opinion of the Construction Administrator or Owner is rendered necessary as a result of the materials, equipment or workmanship which are inferior, defective, or not in accordance with terms of the Contract, the Contractor shall promptly upon receipt of notice from the Construction Administrator or Owner and without expense to the Construction Administrator or Owner:
 - 1) Place in satisfactory condition, in every particular, all of such guaranteed work, correct all defects thereof, and
 - 2) Make good all damages to the building or site, or equipment or contents thereof, and
 - 3) Make good any work or material, or equipment and contents of said building or site disturbed in fulfilling any such guarantee.
- C. In any case where in fulfilling requirements of the Contract or of any guarantee embraced in or required thereby the Contractor disturbs any work, it shall restore such disturbed work to a condition satisfactory to the Construction Administrator.
- D. If the Contractor, after notice, fails to proceed promptly to comply with terms of its guarantee, the Owner may have the defects corrected and the Contractor shall be liable for all expenses incurred.
- E. All special guarantees applicable to definite parts of the work that may be stipulated in the Specifications or other papers forming a part of the Contract shall be subject to the requirements and term of this article.

37. SEPARATE CONTRACTS

- A. Contractor's attention is specifically directed to the fact that, because of the work of other contracts within and adjacent to the limits of this Contract they may not have exclusive occupancy of the territory within or adjacent to the limits of this Contract.
- B. Contractor's attention is further directed to the fact that, during the life of this Contract the owners and operators of Public Utilities may make changes in their facilities. These changes may be made by the Utility employees or by contract within the limit or adjacent to these contracts and may be both temporary and permanent.

GENERAL CLAUSES

- C. Contractor shall be required to cooperate with other contractors and the owners of the various utilities, and to coordinate and arrange the sequence of their work to conform to the progressive operations of the work already under contract and to be put under contract.
- D. Contractor shall be responsible for the coordination of the work of their various subcontractors. Their respective operations shall be arranged and conducted so that delays will be avoided. Where the work of a subcontractor overlaps or dovetails with that of other subcontractors, materials shall be delivered and operations conducted so as to carry on the work continuously in an efficient and workmanlike manner. Delays or oversights on the part of Contractor or its subcontractors or utility owners in getting any or all of their work done in the proper way thereby causing cutting, removing and replacing work already in place, shall not be the basis for claim for extra compensation.
- E. In case of interference between the operations of the utility owners and different Contractors, the Construction Administrator will be the sole judge of the rights of each Contractor and the sequence of work necessary to expedite the completion of the entire project, and in all cases the Construction Administrator's decision shall be accepted as final and may not be challenged except in a proceeding brought pursuant to Article 78 of the Civil Practice Law and Rules.

38. COOPERATION WITH OWNER

Each Contractor shall cooperate with the Owner as to parking of vehicles, availability of storage and working areas and confining of activities and personnel to same. **NO PARKING FOR CONTRACTOR'S EMPLOYEES.**

39. JOB MEETINGS & PROJECT SUPERINTENDANT

- A. An officer of the Contractor, or its project manager or superintendent, who is fluent in English and authorized to make binding decision on behalf of the Contractor shall attend job meetings with the Commissioner and/or the Construction Administrator, and any subcontractors whom the Inspector may designate; for the purpose of discussing expedition, execution and coordination of the work.
- B. Job meetings will be scheduled periodically (the first to be prior to commencement of construction) at a time and place designated by the Construction Administrator.
- C. The Contractor shall not commence any work prior to the first (pre-construction) meeting between the Contractor, Commissioner and/or Construction Administrator, client, and other concerned governmental and utility company representatives.
- D. At the pre-construction meeting, the scheduling of the work on an arrow-flow diagram (showing chronologically and in detail the sequence and methods that will be followed) will be provided, and details for the proper execution and special requirements of the work will be explained and discussed.
- E. The Contractor shall be responsible for providing a detailed construction schedule that provides for a Critical Path Method ("CPM") and which is compatible with any of the state of the art CPM Method scheduling software.

GENERAL CLAUSES

F. Updated coordinated arrow-flow diagrams or CPM schedules, as the case may be, will be provided by the Contractor, as above, on a monthly basis to the County.

The Contractor shall indicate on the construction schedules noted above, time for shop drawing preparation, approvals, fabrication and delivery of materials and equipment for major items. The County may request that additional important items be included on the schedule.

G. The Contractors shall ensure that its Project Superintendent shall be on site full time at all times when the Contractor's Work is being performed.

40. PATENT WARRANTY

A. Contractor expressly represents, warrants and agrees that he has the legal right to furnish and install and to authorize the County to purchase and use the equipment hereby offered and each and every one of its several parts and every feature thereof, under one or the other, or partly under one and partly under the other of the following representations.

- 1) That the Contractor possesses a valid patent(s) covering the equipment to be furnished hereunder or part or features thereof or has or will obtain permit(s) and license(s) authorizing the Contractor to furnish and install same and to authorize the purchase and use thereof by the County.
- 2) The Contractor is responsible before ordering material, equipment, parts, systems, etc, to verify that the suppliers of all such material, equipment, parts, systems, etc, will supply the required warranty, guarantee, O & P manual, and maintenance service schedule.
- 3) That the equipment offered or certain parts or features thereof are not covered by any valid patent(s) within the knowledge of the Contractor.

B. Contractor further warrants and agrees that if any patent(s) is hereafter issued to any person whatsoever with respect to the equipment or any part or features thereof, to be furnished and installed hereunder, the Contractor will obtain such permit(s) or license(s) from the Patentee as may be necessary to authorize the use of the equipment by the County.

C. Contractor further represents, warrants and agrees that he and its sureties shall hold themselves responsible for and defend any claims made against the County for any infringement of patents due to the purchase and use by the County of said equipment or any part or feature thereof; that they will indemnify and save harmless the County from all costs, expenses and damages which it shall be obliged to pay by reason of any such infringement of patent(s); that in case the use of any such equipment is enjoined, they will bear the expenses of removing same and replacing same with equipment which will satisfactorily perform the function without constituting an infringement of any patent(s); and in case the use of any equipment shall be enjoined, that they shall pay to the County the sum of \$1,000.00 per day, as liquidated damages, for each and every day during which the County shall be enjoined from using the same up to the day on which such

GENERAL CLAUSES

equipment is replaced by other equipment which will satisfactorily perform the same function but which will not constitute an infringement of any other patent(s).

- D. The Contractor further agrees in the event the use of any of the equipment is enjoined and the Contractor is unable within a reasonable time to devise other equipment which will satisfactorily perform the same functions without infringement on any patent(s), that he will remove the equipment and refund to the County the entire cost of its purchase and installation, plus the sum of \$ 1,000.00 per day as liquidated damages for each and every day until the substitute equipment has been purchased and installed by the County, excepting however that such period shall not exceed three months.
- E. The Contractor further agrees in the event that any claim or notice of claim for infringement of patent(s) are made or filed prior to the making of payment by the County for the equipment and/or material proposed to be furnished and installed hereunder, that the County may withhold any sum due to the Contractor for such equipment and/or material until such claims shall have been settled or adjudicated or until additional surety bonds or other guarantees of indemnification shall have been posted, if deemed necessary by the County for its protection.

41. MATERIALS

A. Quality

- 1) It is the intent of these Specifications to describe definitely and fully the character of materials and workmanship required with regard to all ordinary conditions of the work and to require first-class work and new and best quality materials in all particulars. For unexpected conditions arising during the progress of the work and not fully covered herein, the Specifications shall be interpreted by the Construction Administrator to require first-class work and materials and such interpretations shall be accepted by the Contractor.
- 2) The Contractor is responsible before ordering material, equipment, parts, systems, etc, to verify that the suppliers of all such material, equipment, parts, systems, etc, will supply the required warranty, guarantee, O & P manual, and maintenance service schedule.
- 3) Where materials or devices are specified in these documents by reference to government, manufacturer's association, or professional society standards, the pertinent sections of the latest edition of such standards shall have the same force and effect as if set forth in full in these Specifications. The following abbreviations shall be used as indicated for the principal societies:

AASHO	American Association of State Highway Officials
ACI	American Concrete Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute

GENERAL CLAUSES

ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
AWI	American Woodworking Institute
AWS	American Welding Society
BHMA	Builders Hardware Manufacturers Association
CS	Commercial Standards
FS	Federal Specifications
IEEE	Institute of Electrical and Electronic Engineers
NEC	National Electric Code
NEMA	National Electrical Manufacturer's Association
NFPA	National Fire Protection Association
SDI	Steel Deck Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Incorporated
TCA	Tile Council of America, Incorporated
TMCA	Tile and Marble Contractors of America
UL	Underwriter's Laboratories, Incorporated

B. Delivery, Storage and Handling:

- 1) Materials shall be delivered in manufacturer's original sealed containers with complete identification of contents and manufacturer, and kept sealed in original containers until used. Labels shall not be removed until materials have been installed and inspected.
- 2) Materials shall be delivered, stored, and handled with proper equipment and in a manner to protect them from damage.
- 3) The Contractor shall make arrangements for the receipt of materials delivered to the construction site. No representative of the County will accept any materials ordered by the Contractor.
- 4) Finish materials shall be protected from dirt and damage, and perishable materials shall be stored within appropriate weatherproof enclosures.
- 5) Delivery of materials shall be coordinated with the Operations Schedule.
- 6) The Contractor shall confine the apparatus, the storage of materials and the operations of the workmen to the limits indicated by law, ordinances, permits, or directions of the Construction Administrator, and shall not encumber the premises beyond the contract limits.

GENERAL CLAUSES

- 7) The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.
- 8) Whenever the Contract Documents require delivery by the Contractor of any materials, equipment, or other items, the term delivery shall be deemed to include unloading and storing with proper protection where directed.

C. Federal Regulations

- 1) Should the Federal Government, because of Declaration of an Emergency, or other cause, establish controls over the use of certain construction materials, then the Contractor, immediately after signing the Contract or immediately after Declaration of an Emergency, shall furnish the Commissioner with an itemized list of all critical materials required for use on the project. For each item, the quantity required and the approximate date on which delivery will be required shall be indicated.

D. Name Plates

- 1) Each piece of operable equipment to be furnished and installed by a Contractor under its Contract such as motors, pumps, heaters, fans, transformers, switch and fuse racks and other similar equipment shall be provided with a substantial name plate of non-corrodible metal securely fastened in place and clearly and permanently inscribed with the manufacturer's name, the model or type designation, the serial number, the principal rated capacities, the electrical or other power characteristics and other similar and appropriate information.
- 2) Manufacturer's identification shall be inconspicuous, but where nameplates contain information relative to characteristics or maintenance, they shall be clearly visible and located for easy access.
- 3) The nameplate of a subcontractor or a distributor will not be permitted.

E. Manufacturer's Certification

- 1) Prior to the delivery of any water or sewer pipe to the construction site, the Contractor shall furnish properly attested documents certifying as to the type, class, name of manufacturer and source of supply of the pipe. One copy of each document shall be forwarded to the Construction Administrator at the construction site and to the Director of Project Management care of the Engineering Division, Michaelian Office Building, White Plains, New York.

F. Samples

- 1) The Contractor shall furnish, for approval of the Engineer, any samples required by the specifications or that may be requested by the Owner, of all materials he proposes to use, and shall pay all shipping charges for the samples. The Contractor shall send all samples to the office of the Engineer, except when directed otherwise. The sample of approved material will remain on file in the Engineer's office. A disapproved sample will be returned to the Contractor.
- 2) No samples are to be submitted with bids.
- 3) No materials or equipment of which samples are required to be submitted for

GENERAL CLAUSES

approval shall be used on the work until such approval has been given by the Engineer or Construction Administrator, save only at the Contractor's risk and expense.

- 4) Each sample shall have a label indicating the material represented, its place of origin and the names of the producer, the Contractor and the Contract for which the material is intended.
- 5) Approval of any sample shall be only for characteristics or for uses named in such approval, and no other. No approval of a sample shall be taken in itself to change or modify any Contract requirement. When a material has been approved, no additional sample of that material will be considered and no change in brand or make will be permitted. Approved samples held by the Engineer will be returned to the Contractor upon completion of the work, if requested.
- 6) Transactions with manufacturers or subcontractors shall be through the Contractor.

G. Dissimilar Materials

- 1) Where metals are placed in contact with or fastened to dissimilar metals, concrete, masonry, wood or other absorptive materials subject to repeated wetting or wood treated with a preservative non-compatible with the metal or if drainage from dissimilar materials passes over the work; treat the contact surfaces with a heavy coat of approved alkali-resident bituminous paint.
- 2) Where one of the metals is aluminum, a coat of zinc-chromate primer shall be applied prior to the bituminous paint.

42. STANDARD OF QUALITY

Wherever in the contract documents an article, material, apparatus, device, product or process is called for by trade name or catalog reference, or by the name of the patentee, manufacturer or dealer, it shall be construed as establishing a standard of quality and not construed as limiting competition. In such instances, the Contractor may use any article, material, etc. which, in the judgment of the Engineer, expressed in writing, is equal to and acceptable for the intent specified.

43. PROPRIETARY ITEM

Whenever less than three names are used in proprietary item specifications, it has been determined that:

- A. The use of trade names is necessary for effective and workable specifications for the item.
- B. All manufacturers known by the individuals familiar with the trade involved have been listed.
- C. Equal items may be approved in accordance with Article "Request For Approval Of Equal" of the General Clauses.

GENERAL CLAUSES

44. SHOP DRAWINGS

A. Shop Drawing Schedule

- 1) Within fifteen (15) days after the Notice to Proceed, the Contractor shall prepare and submit two (2) copies of its schedule of Shop Drawing submissions to the Engineer for review and approval. The schedule is to be submitted on the “Shop Drawing Schedule” form of the Sample Forms.
- 2) In order to maintain the construction schedule for this project the Contractor shall submit all Shop Drawings per approved schedule. The Contractor is expressly cautioned that its failure or refusal to timely submit a shop drawing schedule acceptable to the Engineer and/or any deviation from the approved shop drawing schedule shall be deemed a default under this Contract.
- 3) Shop Drawings shall be submitted without fail in time to permit correction, resubmission and final approval, as hereinafter specified, without causing any delay in the construction of any Work.
- 4) Samples and Shop Drawings, which are related to the same unit of Work or Specification Section, shall be submitted at the same time. If related Shop Drawings and Samples are submitted at different times, they cannot be reviewed until both are furnished to the Engineer.
- 5) The schedule shall be updated every four-(4) weeks or more frequently as required by the Engineer.
- 6) Two (2)-updated copies of the schedule shall be submitted to the Engineer with each application for Partial Payment.
- 7) Form of Schedule

Schedule shall be in tabular form with appropriate spaces to insert the following information for principal items of equipment and materials:

- a. Date on which Shop Drawings are requested and received from the manufacturer.
- b. Dates on which Shop Drawings are transmitted to the Engineer by the Contractor.
- c. Dates on which Shop Drawings are returned by the Engineer for revisions.
- d. Dates on which Shop Drawings are revised by manufacturer and resubmitted to the Engineer.
- e. Date on which Shop Drawings are returned by Engineer annotated either “Approved” or “Approved as Noted”.
- f. Date on which accepted Shop Drawings are transmitted to manufacturer and Contractor’s Invoice Number.
- g. Date of manufacturer’s scheduled delivery.
- h. Date on which delivery is actually made.

GENERAL CLAUSES

i. Sample of schedule follows on next page.

B. Shop Drawing Requirements

- 1) Shop Drawings for the Work shall include working and setting drawings, schedules, shop details, wiring diagrams, manufacturer's catalog cuts and brochures and all other drawings, schedules and diagrams necessary for the proper correlation of the Work.

Insofar as it is practicable, all drawings shall be uniform in size. They shall be dated, numbered consecutively and shall be identified with the Contract Number and Title, a description of the material or equipment and the area of the work and where it is to be installed. Shop drawings shall accurately and clearly show sizes, work, erection dimensions, arrangement and sectional views, necessary details including information for making connection with the work of other items as may be required, materials and finishes, detailed parts lists, and performance characteristics and capacities as may be required.

- 2) All detailing for structural components shall be done in accordance with the provisions for design and workmanship in the latest additions of the publications listed below except as may be modified in the Contract Documents:
 - a. "Manual of Steel Construction" of the American Institute of Steel Construction.
 - b. "Building Code Requirements for Reinforced Concrete" and "Manual of Standard Practice for Detailing Reinforced Concrete Structures" of American Concrete Institute.
- 3) Detailing practices for other components shall be done to conform to the best trade practices.
- 4) Contractor Responsibilities
 - a. Before submitting Shop Drawings to the Engineer all submittals from its Subcontractors, manufacturers or suppliers shall be sent directly to the Contractor for preliminary review, coordination and checking.

Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of material or equipment. Contractor shall thoroughly check all drawings for accuracy and conformance to the intent of the Contract Documents. Drawings found to be inaccurate or otherwise in error shall be returned to the Subcontractors, manufacturers, or suppliers by the Contractor for correction.

- b. All submittals, including Shop Drawings prepared by or under the direction of the various Contractors, shall be thoroughly checked by the Contractor for accuracy and checked by the Contractor for accuracy and conformance to the intent of the Contract Documents before being submitted to the Engineer and shall bear the Contractor's signature certifying that they have been so checked. Before submitting them to the Engineer, all submittals shall be properly labeled and consecutively numbered. In a clear space above the title block, the Contractor shall provide the "Shop Drawing ID" form of the Sample Forms, and enter the required information:

GENERAL CLAUSES

- c. Shop Drawings shall be submitted as a single package including all associated drawings for any operating system and shall include all items of equipment and any mechanical units involved or necessary for the functioning of such system. Where applicable, the submittal shall include elementary wiring diagrams showing circuit functioning and necessary interconnecting wiring diagrams for construction.
- d. If the submittals contain any departures from the Contract Documents, specific mention thereof shall be made in the Contractor's letter of transmittal. Otherwise, the review of such submittals shall not constitute approval of the departure. The Contractor shall also call the Engineer's attention to any changes by the use of larger letters of at least 1" in height on the Shop Drawings along with a letter by the Contractor advising the Engineer to the recommended change and the reason therefore. If this is not done, even if the Work is incorporated in the construction, it will not be accepted by the Engineer even if Shop Drawings are "Approved".
- e. No materials or equipment shall be ordered, fabricated or shipped or any Work performed until the Engineer returns to the Contractor the submittals herein required, annotated "Approved".
- f. Where errors, deviations, and/or omissions are discovered at a later date in any of the submittals, the Engineer's prior review of the submittals does not relieve the Contractor of the responsibility for correcting all errors, deviations and/or omissions.
- g. Two (2) copies of Preliminary Operations and Maintenance Manuals shall be submitted with the final Shop Drawings for each item of equipment.
- h. Submittals shall be transmitted in strict compliance with Special Clause 10. A.2 and in sufficient time to allow the Engineer adequate time for review and processing so as not to delay the Project per the approved Shop Drawing Schedule.
- i. Contractor shall transmit five (5) prints of each submittal to the Engineer for review. Any submissions, which in the opinion of the Engineer, are not legible will not be reviewed and will be returned to the Contractor annotated "Disapproved".
- j. Contract drawings are for engineering and general arrangement purposes only and are not to be used as Shop Drawings.
- k. Shop Drawings shall accurately and clearly present the following:
 - All working and installation dimensions.
 - Arrangement and sectional views.
 - Units of equipment in the proposed positions for installation, details of required attachments and connections, and dimensioned locations between units and in relation to the structures.
 - Necessary details and information for making connections between the

GENERAL CLAUSES

various trades including, but not limited to, power supplies and interconnecting wiring between units, accessories, appurtenances, etc.

- l. Structural and all other layout drawings prepared specifically for the Project shall have a plan scale of not less than 1/4-inch equal to 1 foot and they shall be not larger than the size of the Contract Drawings.
 - m. Where manufacturer's publications in the form of catalogs, brochures, illustrations, compliance certificates, or other data sheets are submitted in lieu of prepared Shop Drawings, such submissions shall specifically indicate the item for which approval is requested. Identification of items shall be made in ink, and submissions showing only general information are not acceptable.
 - n. The Contractor shall provide all required copies for the use of the various trades and at the Site, and one (1) copy of approved Shop Drawings shall be provided by the Contractor to each of the other Prime Contractors unless otherwise noted in writing by the Engineer.
 - o. The Contractor shall respond to required submittals with complete information and accuracy to achieve required approvals within three (3) submissions. All costs to the Owner involved with subsequent submissions of Shop Drawings, Samples or other items requiring approval, will be backcharged to the Contractor, at the rate of 3.0 times direct technical labor cost, by deducting such costs from payments due for Work completed. In the event an approved item is requested by the Contractor to be changed or substituted, all involved costs in the review process will likewise be paid by the Contractor to the County unless determined by the Director of Project Management or Commissioner that the need for such deviation is beyond the control of the Contractor. Contractor shall be responsible for coordinating its Work and submittals with its Subcontractors.. Should Contractor cause the need for additional submissions or reviews of previous submissions all involved costs will similarly be paid to the County.
- 5) Procedure for Review
- a. Shop Drawings will be checked for design conformance with the Contract Documents and general arrangement only.
 - b. Submittals will be annotated by the Engineer in one of the following ways:
 - "Approved" - no exceptions are taken.
 - "Approved as Noted" - minor corrections are noted and shall be made and a resubmittal is required.
 - "Disapproved because" - with specific deficiencies noted.
 - "Disapproved" - based on the information submitted, the submission is not in conformance with the Contract Documents. The deviations from the Contract Documents are too numerous to list and a completely revised submission of the proposed equipment or a submission of other equipment is required.

GENERAL CLAUSES

c. One copy of the reviewed submittals will be returned to the Contractor. It is the Contractor's responsibility to provide copies to:

- Its Subcontractors.
- Its Materialmen and Suppliers.

unless notified otherwise in writing by the Engineer.

- 6) Disapproved drawings will be returned to the Contractor for correction and resubmission. After the Contractor has had the required corrections made on the original drawing, it shall again submit five copies for review by the Engineer.
- 7) The acceptance of Shop Drawings by the Engineer shall be only general in nature and shall not relieve the Contractor of any responsibility for the accuracy of the drawings, the proper fitting and construction of the Work or for the furnishing of materials or other Work required by the Contract Documents, but not shown on the Shop Drawings. Acceptance of Shop Drawings by the Engineer shall not be construed as approving departures from the Contract requirements unless specifically noted by the Engineer. Acceptance of Shop Drawings for one item shall not be construed as approval for other changes even if noted by the Contractor on the drawing.
- 8) Shop Drawings submitted other than in accordance with the outlined procedures will be returned to the Contractor for resubmission and the Contractor shall bear all expense and risk of all delays as if no Shop Drawings had been submitted.
- 9) No Work shall be performed until the Shop Drawings have been accepted by the Owner, and the Contractor shall be responsible for all costs and damages, which may result from proceeding prior to the approval of the Shop Drawings.

45. SEQUENCE OF CONSTRUCTION OPERATIONS

- A. It is mandatory that the premises continue to be occupied and facilities therein shall continue to function during the performance of the construction work.
- B. Detailed sequence of construction and availability of spaces in areas through which services must pass shall be coordinated between the Owner and the Contractor, before actual commencement of the Work.
 - 1) To enable the Work to be laid out and prosecuted in an orderly and expeditious manner, Contractor shall provide a proposed Progress Schedule, within fifteen (15) days after the issuance of the Notice to Proceed of this Contract unless otherwise directed in writing by the Construction Administrator. The proposed Progress Schedule shall show the anticipated time of commencement and completion of each of the various operations to be performed under this Contract; together with all necessary and appropriate information regarding the sequence and correlation of Work; and the Schedule of Shop Drawings and delivery of all materials and equipment required for the Work. The Contractor shall prepare a Master Progress Schedule (Schedule) for the Work. Contractor as directed by the Construction Administrator shall revise the proposed Schedule until each activity is properly sequenced to provide that the Work will be completed in the proper order and

GENERAL CLAUSES

within the allotted Contract duration, without any conflicts. When the Construction Administrator has accepted the Schedule the Contractor will sign it. The Contractor shall then provide one (1) copy of such approved Schedule to each Subcontractor and two (2) copies to the Construction Administrator. Contractor shall afford its Subcontractors a reasonable opportunity for the introduction and storage of their materials and the execution of their Work and shall properly connect and coordinate its Work with others.

Contractor shall strictly adhere to the Schedule unless changed as provided for in the following paragraph.

- 2) Within five (5) days after receiving notice of any change in the Contract, or of any Extra Work to be performed, or of any suspension of the whole or any portion of the Work, or of any other conditions which are likely to cause or are actually causing delays, Contractor must notify the Construction Administrator in writing of the effect, if any, of such change or Extra Work or suspension or other condition upon the previously approved schedule, and must state in what respects, if any, the Schedule should be revised, with the reasons therefor. These proposed changes in the Schedule shall be reviewed and, if appropriate, approved, in writing, by the Construction Administrator. Contractor must strictly adhere to the revised Schedule. Distribution of the revised Schedule shall be as described in paragraph B-1 above. Contractor's compliance with the requirements of this paragraph is in addition to, and not in lieu of, compliance with other notice requirements pertaining to delays and extensions of time contained elsewhere in the contract.
 - 3) The Schedule shall be reviewed by Contractor every two (2) weeks or as directed by the Construction Administrator.
 - 4) If Contractor shall fail to adhere to the approved Schedule, or to the Schedule as revised, they must promptly adopt additional means and methods of construction with no additional cost to the County that will make up for the lost time and will assure completion in accordance with such Schedule. The proposed means and methods shall be described in writing to the County within two (2) days after the Contractor discovered or should have reasonably discovered that the Schedule would not be met as originally proposed. Failure to comply with this requirement may result in the County enforcing its rights under the Contract including, without limitation, default of the Contract.
- C. From time to time as the Work progresses and in the sequence indicated by the approved Schedule, the Contractor must submit to the Construction Administrator a specific request in writing for each item of information or approval required. These requests shall be submitted sufficiently in advance of the date upon which the information or approval is actually required by the Contractor to allow for the time the Construction Administrator may reasonably take to act upon such submissions or resubmissions. The Contractor shall not have any right to an Extension of Time on account of delays due to its failure to timely submit requests for the information or approvals.
- D. Certain construction work shall be required, which will be disruptive to the Owner's staff insofar as noise, dirt and dust is concerned. The Contractor, therefore, shall

GENERAL CLAUSES

perform such work during other than normal working hours. Subject to the requirements of law, the Owner imposes no limitation on the Contractor's working hours and whatever overtime work may be necessary or required shall be considered by the Contractor and reflected in its Bid Proposal without the benefit of extra compensation.

46. PROTECTION

- A. The Contractor shall at all times exercise all necessary precautions for the safety of the public, employees performing the work and County personnel. The Contractor shall provide and maintain barricades, danger signals and other safeguards about the work and shall be held responsible for all accidents or damages to persons or property caused by failure to do so throughout the progress of the work, and shall comply with all applicable provisions of Federal, State and County Safety Laws.
- B. The Contractor shall during the performance of its work, protect at all times all adjacent portions of the existing surfaces and existing equipment from damage due to the performance of the construction work.
- C. The Contractor shall furnish temporary facilities and/or temporary dust-proof partitions separating all work areas and access routes from those areas not involved in active alterations, so that this work will not interfere with the Owner's access or normal use of areas not allocated to the Contractor, or any essential service to such areas, when ordered by the Construction Administrator.

47. CLEANUP AND REMOVAL OF DEBRIS

- A. At the end of each working day, the Contractor shall sweep up and collect all the rubbish and place it in appropriate containers, furnished by the Contractor. Containers shall be kept at a location on, or adjacent to the work site, as designated by the Construction Administrator. Wood or cardboard crates and other debris of a similar nature shall be broken up, securely bundled and neatly stacked alongside the containers. Once each week and at the completion of the work, the Contractor shall remove all accumulated debris and rubbish.
- B. At the completion of the work, the Contractor shall clean all equipment, fixtures, surfaces and accessories, removing all dust and other foreign matter, ready for use by the Owner.

48. TEMPORARY SERVICE

- A. Sanitary facilities will be provided by the Contractor for its personnel.
- B. The Contractor will supply and pay for the cost of all-temporary water and temporary electric power (120 volt, 60 hertz). The Contractor shall furnish and install all temporary electrical and water connections required for work under this Contract, at and to locations as designated by the Construction Administrator.

GENERAL CLAUSES

49. OPERATING TESTS

- A. Where operating tests are specified the Contractor shall test the work as it progresses and shall make satisfactory preliminary tests in all cases before applying to the Engineer for official tests.
- B. Official tests will be made in the manner specified for the different branches of the work, in the presence of the Construction Administrator or Engineer. Should defects appear they shall be corrected by the Contractor and the test repeated until the installation is acceptable to the Construction Administrator or Engineer and to any authorities having jurisdiction.
- C. No work of any kind shall be covered or enclosed before it has been tested and approved.
- D. The Contractor shall furnish all materials and apparatus, make connections and conduct tests, without extra compensation unless noted otherwise.

50. OPERATING INSTRUCTIONS AND PARTS LISTS

- A. Where the Specifications require any Contractor to supply equipment operating and maintenance instructions and spare parts lists prior to the completion of the work it shall provide three copies of the publications for each piece of equipment he has furnished and installed under the Contract, upon receipt of the approved shop drawings.
- B. Publications shall be prepared for the specific equipment furnished and installed, containing the following information, and shall not refer to other sizes, types or models of similar equipment:
 - 1) Clear and concise instructions for the operation, adjustment, lubrication and other maintenance of the equipment, including a complete lubrication chart.
 - 2) A complete listing of all parts for the equipment, with catalog numbers and other data necessary for ordering replacement parts.
- C. Advertising literature will not be acceptable.

51. CUTTING AND PATCHING

Contract with Single Bid:

- A. Where the project does not involve separate bids pursuant to the New York General Municipal Law the following will apply:
 - 1) Where walls, floors, ceilings, roofs or other items require cutting for the installation of new work, all such cutting shall be done by the Contractor with the approval of the Construction Administrator; and the Contractor shall patch the opening to make the cut portions match the adjacent finished surfaces, unless otherwise indicated.
 - 2) The Contractor shall not endanger any existing condition by its operations.
 - 3) The cost of all cutting and patching caused by the Contractor's negligence shall be

GENERAL CLAUSES

borne by the Contractor.

Contract with Separate Bids:

- B. If the project is one where separate bid specifications are required pursuant to the New York General Municipal Law the following will apply:
- 1) A sufficient time in advance of the construction of new floors, walls, ceilings, roofs, or other items, each Contractor shall be responsible for properly locating and providing in place all sleeves, inserts and forms required for their work, and shall furnish the Contractor for General Construction with complete information relative to exact locations and dimensions of all required openings in the General Contractor's work. Other Contractors shall periodically consult the Job Progress Chart of the General Contractor so that they will not be delayed by their work requirements, but the General Contractor shall be obliged to give all other Contractors at least seventy-two hours notice before commencing the previously mentioned new construction work.
 - 2) The cost shall be borne by the responsible Contractor for all cutting, patching, re-waterproofing and re-caulking of new work necessary for reception of the work of a Contractor, caused by the Contractor's failure to timely or properly locate and provide in place all sleeves, inserts and forms required for its own work, or by a Contractor's failure to inform the General Contractor of required openings. The General Contractor shall do all cutting, patching, re-waterproofing and re-caulking of all new work no matter how or by whom such work was caused and shall be reimbursed for such extra work by the responsible Contractor, in accordance with the terms of the Contract. All cutting and patching shall have prior approval of the Construction Administrator.
 - 3) Where sleeves, inserts, forms or openings are required in existing walls, floors, ceilings roofs, or other existing items, all necessary cutting, patching, re-waterproofing and re-caulking required shall be done by the individual responsible Contractor, except for finished surfaces. The responsible Contractor shall do all rough patching to bring the cut areas to the proper surface ready to receive the finished surface. All finishing work required to make the cut portions match the adjacent finished surfaces shall be performed by the General Contractor.
 - 4) Each Contractor shall be responsible for coordinating their work with the work of all other Contractors engaged on the project. If directed, Contractors shall submit coordinated shop drawings showing how the fitting of the various parts of the work will be accomplished, for the Construction Administrator's acceptance.
 - 5) All cutting and patching shall be governed by the applicable divisions of the Specifications with regard to workmanship, materials and methods.
 - 6) No Contractor shall endanger any work by unauthorized cutting, excavating, or other alteration of the work, unless previously authorized by the Construction Administrator.

GENERAL CLAUSES

52. CONFLICTS AMONG CONTRACT DOCUMENTS

In the event of any conflict among the Contract Documents, the Contractor shall notify the Commissioner and comply with the Commissioner's interpretation, according to the following priorities:

<u>Priority Order</u>	<u>Document</u>
1.....	Modification issued after execution of Agreement
2.....	Agreement between Owner and Contractor
3.....	Addenda issued prior to the execution of the Agreement (Later date to take precedence)
4.....	Special Notices
5.....	Technical Specifications
6.....	Construction Drawings:
6A.....	Schedule on Construction Drawings
6B.....	Notes on Construction Drawings
6C.....	Large Scale Details on Construction Drawings
6D.....	Small Scale Details on Construction Drawings
7.....	General Requirements
8.....	Special Clauses
9.....	Information for Bidders and General Clauses

53. RECORD DRAWINGS

- A. The Owner shall furnish, at the first job meeting, one set of "paper" copies of the contract drawing(s) - this is in addition to the five sets of contract drawings as described in the Article "Contract Drawings" of the General Requirements; for the Contractor's use to indicate change(s) as they occur for the duration of the construction work. Upon request from the Contractor, the County will supply the Contractor a copy of the original Contract Drawings in AutoCAD format.
- B. The Contractor shall record neatly and legibly, using reasonable drafting care, all approved change(s) (including minor revisions or corrections of pipes, ducts, electric outlets, circuit panels and other features, as well as invert elevations and locations of underground lines).
- C. When all approved changes are recorded and clearly identified, the Contractor shall prepare a set of "as-built" (record) drawings, in the latest version of AutoCAD, using the approved County format and associated CAD layering guidelines, with 24" x 36" drawing sizes, showing the project as built including all changes in the work made during construction based on marked-up prints, drawings, and other data. These drawings shall be filed on a CD and submitted to the Construction Administrator.
- D. All additional "paper" or reproducible drawings are to be obtained by the Contractor at their own expense.

GENERAL CLAUSES

54. TIME

- A. All time limits (see Article “Required Time For Completion Of The Work” of the General Requirements, and, Article “Time Of Starting” of the Information For Bidders) stated in the specifications are of the essence of the Contract.
- B. The Contractor may perform all necessary labor during other than normal working hours. The Owner imposes no limitation of the Contractor's working hours and whatever overtime work may be necessary or required shall be considered by the Contractor and reflected in its Bid Proposal without the benefit or extra compensation. The Contractor must give a minimum of four (4) hours notice to the Construction Administrator when overtime Work is necessary. The Contractor shall promptly pay to the County the additional cost of the Engineer and Construction Administrator for inspection services during the overtime Work.

55. ACCELERATION OF THE WORK

The Owner may, at its sole discretion and for any reason, require the Contractor to accelerate the schedule of performance by providing overtime, extended day, extra crews, Saturday, Sunday and/or holiday work and/or by having all or any subcontractors designated by the Owner provide overtime, extended day, extra crews, Saturday, Sunday or holiday work by the Contractor’s or his subcontractor’s own forces, and such requirements is independent of and not related in any way to any apparent inability of the Contractor to comply with the schedule(s), Milestone(s) and/or completion date requirements, the Owner, pursuant to a written change order as signed by the Commissioner shall reimburse the Contractor for the direct cost to the Contractor of the premium time for the labor utilized by the Contractor in such overtime, extended day, extra crews, Saturday, Sunday or holiday work (but not for the straight time costs of such labor) together with any social security and state or federal unemployment insurance taxes in connection with such premium time. However, no overhead, supervision costs, commissions, profit or other costs and expenses of any nature whatsoever, including impact costs or costs associated with lost efficiency or productivity, shall be payable in connection therewith. Anything to the foregoing notwithstanding, in the event that the Contractor has fallen behind schedule or in the Owner’s judgment appears likely to fall behind schedule, Owner shall have the absolute right to direct the Contractor to accelerate the performance of its work, including that of its subcontractors, and the full costs for such acceleration shall be borne solely by the Contractor.

56. ULTRA LOW SULFUR DIESEL FUEL

- A. Contractors and Subcontractors operating onroad and nonroad vehicles to perform County work must power those vehicles with ultra low sulfur diesel fuel. Ultra low sulfur diesel fuel is any diesel fuel that has a sulfur content of no more than fifteen parts per million.
- B. In addition, all onroad and nonroad diesel vehicles used to perform County work and equipped with a model year 2003 or older engine shall utilize the best available

GENERAL CLAUSES

technology² in accordance with the following schedule:

- a) effective September 1, 2007 - 35% of all such motor vehicles used on this project;
 - b) effective September 1, 2008 - 65% of all such motor vehicles used on this project;
 - c) effective September 1, 2009 - 100% of all such motor vehicles used on this project.
- C. All onroad and nonroad diesel vehicles to perform County work having a gross vehicle weight rating of more than 14,000 pounds shall utilize the best available technology or be equipped with an engine certified to the applicable 2007 United States Environmental Protection Agency (“EPA”) standard for particulate matter as set forth in Section 86.007-11 of Title 40 of the Code of Federal Regulations or to any subsequent EPA standard for such pollutant that is at least as stringent, in accordance with the following schedule:
- a) by September 1, 2007 - 35% of all such motor vehicles;
 - b) by September 1, 2008 - 65% of all such motor vehicles;
 - c) by September 1, 2009 - 100% of all such motor vehicles
- D. Any contractor who violates any provision of Section 873.1329 shall be liable for a civil penalty not to exceed ten thousand dollars plus twice the amount of money saved by such contractor for failure to comply with this section.
- E. Any contractor who makes a false claim may be liable for a civil penalty not to exceed twenty thousand dollars, in addition to twice the amount of money saved by such contractor as a result of having made such false claim.
- F. Nothing in this section shall be construed to limit the County’s authority to cancel or terminate a contract, deny or withdraw approval to perform a subcontract or provide supplies, issue a non-responsibility finding, issue a non-responsiveness finding, deny a person or entity pre-qualification as a vendor, or otherwise deny a person or entity public entity business.
- G. If sufficient quantities of ultra low sulfur diesel fuel are not available to meet the needs of a contractor to fulfill the requirements of this contract, the Contractor may submit a written request to the Commissioner to use diesel fuel with a sulfur content of no more than thirty parts per million as long as the contractor shall use whatever quantity of ultra low sulfur diesel fuel that is available. Such determination shall be made in writing on a case by case basis upon written application to the Commissioner. If the Commissioner grants such authority it shall expire sixty days thereafter and may be renewed upon written request for additional periods of sixty days.

² Best Available Technology means a system for reducing the emission of pollutants which is based on technology verified by the U.S. Environmental protection Agency or the California Air Resources Board or which has been identified pursuant to NYC’s Department of Environmental Protection that (1) reduces diesel particulate matter emissions by at least 85 percent, as compared to a similar engine operating on traditional diesel fuel without emission control technology, or reduces engine emissions to 0.01 grams diesel particulate matter per brake horsepower per hour or less; and 2) achieves the greatest reduction in emissions of nitrogen oxides at a reasonable cost and in no case produces a net increase in nitrogen oxides in excess of 10%.

GENERAL CLAUSES

H. The Contractor, in order to comply with Subsections B & C above, must retrofit its vehicles to include both of the following in order to comply with the Best Available Technology Requirements:

- Diesel Oxidation Catalysts (DOC)
- Crankcase Vent Filters (CVF)

If the Contractor wants to propose an alternative technology it must submit a written request to the Commissioner with sufficient detail to enable the Commissioner to make a determination as to whether to accept the alternative technology. Any approval of alternative technology must be in writing.

57. QUALIFIED TRANSPORTATION FRINGE PROGRAM (VOID)

58. USE OF FLUORESCENT LIGHT BULBS & ENERGY EFFICIENT BULBS

The use of incandescent light bulbs is prohibited in County-owned buildings and facilities. Only fluorescent light bulbs may be installed in County buildings and facilities. Exterior lights must utilize energy-efficient bulbs. For further details see Article 58 of the General Clauses.

59. COUNTY OF WESTCHESTER PHOSPHORUS-FREE LAWN FERTILIZER POLICY

Executive Order 8-2007 limits the use of lawn fertilizers containing phosphorous and other compounds containing phosphorous, such as phosphate on County owned property.

EXECUTIVE ORDER NO.8 OF 2007

WHEREAS, the New York City water supply watershed is a critical drinking water source for approximately eight million New York City consumers and approximately one million upstate consumers. Over eighty-five percent (85%) of Westchester County's residents consume water from the New York City water supply system; and

WHEREAS, eutrophication is a natural aging process of lakes or streams brought on by

GENERAL CLAUSES

nutrient enrichment. Eutrophication can be greatly accelerated by human activities that increase the rate at which nutrients and organic substances enter aquatic ecosystems from their surrounding watersheds; and

WHEREAS, as a result of accelerated eutrophication, enhanced plant growth reduces dissolved oxygen in the water creating severely impaired water bodies with unpleasant water taste and odor, discoloration, release of toxins and increased turbidity that interferes with the health and diversity of indigenous fish, plant, and animal populations and with the recreational use of rivers, lakes and wetlands. Consequently, eutrophication restricts water use for fisheries, recreation, industry, and drinking due to the increased growth of undesirable algae and aquatic weeds and the oxygen shortages caused by their death and decomposition; and

WHEREAS, nutrient pollution due to human activities is one of the leading causes of eutrophication in the NYC Watershed, and is specifically accelerated by the introduction of excessive phosphorus into the environment. In fact, most reservoirs in the East of Hudson portion of the New York City Watershed (5 of the 7 located in Westchester County) are designated as phosphorous-restricted basins in accordance with the New York City Watershed Rules & Regulations due to excessive phosphorous volumes which have not been reduced despite phosphorous reductions mandated by the New York State Department of Environmental Conservation (NYSDEC); and

WHEREAS, one unnecessary source of phosphorus pollution in the watershed is the many pounds of lawn fertilizer applied by residents and businesses in the County of Westchester each year; and

WHEREAS, when phosphorus fertilizer is applied to phosphorus-rich lawns, much of the excess simply runs off of the lawn into the storm drainage systems where it can be carried into rivers, lakes, streams, and wetlands, causing eutrophication; and

WHEREAS, soil tests conducted pursuant to a six-year study by the Cornell Cooperative Extension, an extension of the State's designated Land-Grant University, have shown that approximately 90% of the lawns in Westchester County have medium-to-high levels of phosphorus; and

WHEREAS, the New York City Watershed Pesticide and Fertilizer Technical Working Group, established by the New York City Watershed Memorandum of Agreement, issued a report in 2000, noting the high percentage of phosphorus in regional soils and recommending that phosphorus-based lawn fertilizers be added only when a soil analysis identifies phosphorus deficiencies.

WHEREAS, the proposed Stormwater Phase II regulations recently issued by the New York State Department of Environmental Conservation, and which are expected to go into effect in January of 2008, will allow the use of phosphorus-based lawn fertilizers on municipally-owned land only where soil testing indicates that phosphorus concentrations are inadequate, in order to ensure that municipalities in the New York City Watershed are

GENERAL CLAUSES

taking satisfactory steps to achieve the above-referenced mandatory phosphorous reductions.

WHEREAS, the United States Environmental Protection Agency has also determined that a Nonpoint Source Implementation Plan was necessary in the Croton Watershed because the phosphorus reductions necessary to meet the targeted applicable water quality standards could not be achieved by wastewater treatment plant upgrades alone; and

WHEREAS, Section 110.11 of the Laws of Westchester County places the responsibility to supervise, direct and control, subject to law, the administrative services and departments of the county, upon the County Executive; and

WHEREAS, I have determined that restricting the application and use of lawn fertilizer containing phosphorus on all County-owned property will address one source of unnecessary and preventable phosphorus pollution and will improve water quality in the County; and

WHEREAS, the Department of Planning, after review of the applicable regulations under the State Environmental Quality Review Act, has advised that this Executive Order has been classified as a Type II action, pursuant to 6 N.Y.C.R.R. § 617.5(c)(20), “routine or continuing agency administration and management, not including new programs or major reordering of priorities that may affect the environment,” and 6 N.Y.C.R.R. § 617.5(c)(27), “adoption of regulations, policies, procedures and local legislative decisions in connection with any action on this list.” As such, no further environmental review is required.

GENERAL CLAUSES

NOW THEREFORE, I, _____, County Executive of the County of Westchester, in light of the aforementioned, do hereby order and direct each and every department, board, agency, and commission of the County of Westchester under my jurisdiction to ensure that the policies and procedures set forth in the following Phosphorus-Free Lawn Fertilizer Policy are complied with.

COUNTY OF WESTCHESTER PHOSPHORUS- FREE LAWN FERTILIZER POLICY

I. Definitions:

(1) "Certified laboratory" means any laboratory certified by the New York State Department of Health pursuant to section five hundred two of the New York State Public Health Law to conduct soil analysis.

(2) "Commercial fertilizer" means any substances containing one or more recognized plant nutrients which is used for its plant nutrient content, and which is designed for use or claimed to have value in promoting plant growth, except unmanipulated animal or vegetable manures, agricultural liming material, wood ashes, gypsum and other products exempted by regulation of the New York State Commissioner of Agriculture and Markets.

(3) "Lawn fertilizer" means a commercial fertilizer distributed primarily for non-farm use, such as lawns, shrubbery, flowers, golf courses, municipal parks, cemeteries, greenhouses and nurseries, and such other use as the commissioner may define by regulation. Lawn fertilizer does not include fertilizer products intended primarily for garden and indoor plant application.

II. Use and Application of Lawn Fertilizer:

(1) Any lawn fertilizer that is labeled as containing more than 0% phosphorus or other compound containing phosphorus, such as phosphate, shall not be applied upon any County-owned property, except as provided in section III. Of this Executive Order.

(2) No lawn fertilizer shall be applied upon County-owned property when the ground is frozen.

(3) Lawn fertilizer shall not be applied to any impervious surface upon County-owned property, including parking lots, roadways, and sidewalks. If such application occurs, the fertilizer must be immediately contained and either applied to turf in a manner consistent with this Executive Order or placed in an appropriate container.

III. Exemptions:

The prohibition against the use of lawn fertilizer under section II of this Executive Order shall not apply to:

GENERAL CLAUSES

(1) Newly established turf or lawn areas during their first growing season.

(2) Turf or lawn areas that soil tests, performed within the past three years by a certified laboratory or by the Cornell University Cooperative Extension of Westchester County, confirm the need for additional phosphorus application in accordance with the phosphorus levels established by the Cornell University Cooperative Extension of Westchester County. The lawn fertilizer application shall not contain an amount of phosphorus exceeding the amount and rate of application recommended in the soil test evaluation.

(3) Agricultural uses, vegetable and flower gardens, or application to trees or shrubs.

IV. The transition to phosphorus-free lawn fertilizer shall occur as soon as possible in a manner that avoids wasting of existing inventories; accommodates establishment of supply chains for new products; enables the training of County employees and licensees in appropriate work methods; and allows the phase-out of products and practices inconsistent with this Executive Order. However, in no event shall lawn fertilizer containing phosphorus (i.e., labeled as containing more than 0% phosphorus or other compound containing phosphorus, such as phosphate) be applied upon County-owned property after January 1, 2009, unless an exemption set forth in Section III of this Executive Order applies.

V. This Executive Order shall take effect on the date hereof, and shall remain in effect until otherwise superseded, repealed, modified or revoked.



SAMPLE FORMS

DEPARTMENT OF PUBLIC WORKS

Division of Engineering

SAMPLE FORMS

AFFIRMATIVE ACTION PROGRAM REQUIREMENT- SUBCONTRACTOR(S)

County of Westchester, Department of Public Works

(To Be Completed By Subcontractor and Submitted with Request to Utilize Subcontractor)

Affirmative Action Program

An approved Affirmative Action Plan shall be required for all Subcontractors for public work where the subcontracted work exceeds \$50,000 or more than fourteen (14) persons are employed by the Subcontractor.

Does the Subcontractor participate in an approved Affirmative Action Program? Yes [] No []

If Yes, give name of Program: _____

If No, how many employees will the Subcontractor employ on this project? _____

An approved Affirmative Action Program shall mean a plan approved or adopted by Westchester County including but not limited to, the Home-Town Plan, the Recruitment Training Program or any other program approved or meeting the requirements of the State or Federal government.

The "Monthly Employment Utilization Report" of the Sample Forms, shall be filled out by the Contractor and/or Subcontractor(s) who are required to have an Affirmative Action Program, prior to the start of the work.

SAMPLE FORMS

CONTRACTOR'S REPORT OF EMPLOYMENT AND WEEKLY AFFIDAVIT

County of Westchester, Department of Public Works

Contract No. _____

Report No. _____

Week(s) ending _____

Title of Contract and Location _____

Contractor or Subcontractor _____

Address _____

STATE OF _____)
COUNTY OF _____) SS.:

I, _____, being duly sworn, depose and say:

1. I pay or supervise the payment of the persons employed by _____
(Contractor or Subcontractor)

in connection with the above referenced contract;

2. During the payment period commencing on the ____ day of _____,
20____ and ending on the _____ day of _____, 20____, all persons employed by
_____ in connection with such contract have been paid in full
(Contractor or Subcontractor)

weekly wages and supplements earned by such persons except the following: (strikeout, if not applicable)

3. Such persons have been paid the prevailing rate of wages and the supplements as determined and required by Section 220 of the New York State Labor Law.

SAMPLE FORMS

4. No rebates or deductions have been deducted from such wages and supplements except as authorized or required by applicable statutes or regulations of the Federal, State and County Governments.

5. The following is a true and accurate summary of wages and supplements paid:

_____ During the week _____ Total to date

Number of names on payroll _____

Hours worked _____

Total wages earned _____

6. I have read the foregoing statement of wages and supplement, know the contents thereof, and the same is true to my own knowledge.

(Signature)

STATE OF NEW YORK)
COUNTY OF WESTCHESTER) ss.:

On this _____ day of _____, 20___, before me personally came _____ to me known, and known to me to be the person who executed the above instrument, and who being duly sworn did say that he executed the same.

Sworn to before me
this _____ day of _____

License No.

Notary Public - State of New York

SAMPLE FORMS

MONTHLY EMPLOYMENT UTILIZATION REPORT
County of Westchester, Department of Public Works

<u>MONTHLY EMPLOYMENT UTILIZATION REPORT</u>										CONTRACT NO.:								
WESTCHESTER COUNTY DEPARTMENT OF PUBLIC WORKS DIVISION OF ENGINEERING										REPORTING PERIOD: FROM: _____ TO: _____								
JOB TITLE:										TOTAL NUMBER OF EMPLOYEES		TOTAL NUMBER OF MINORITY EMPLOYEES						
NAME AND LOCATION OF CONTRACTOR:																		
CONSTRUCTION TRADE	CLASSIFICATION	TOTAL ALL EMPLOYEES BY TRADE						BLACK (NOT HISPANIC ORIGINAL)		HISPANIC		ASIAN OR PACIFIC ISLANDERS		AMERICAN INDIAN OR ALASKAN NATIVE		MINORITY PERCENTAGE %	FEMALE PERCENTAGE %	
		M	HRS	F	HRS	M	F	M	F	M	F	M	F	M	F			
	JOURNEY WORKER																	
	APPRENTICE																	
	TRAINEE																	
	SUB-TOTAL																	
	JOURNEY WORKER																	
	APPRENTICE																	
	TRAINEE																	
	SUB-TOTAL																	
	JOURNEY WORKER																	
	APPRENTICE																	
	TRAINEE																	
	SUB-TOTAL																	
	JOURNEY WORKER																	
	APPRENTICE																	
	TRAINEE																	
	SUB-TOTAL																	
	TOTAL JOURNEY WORKER																	
	TOTAL APPRENTICES																	
	TOTAL TRAINEES																	
	GRAND TOTAL (#HRS & #EMPL)																	
COMPANY OFFICIAL'S SIGNATURE AND TITLE:										TELEPHONE NUMBER (Include Area Code):		DATE SIGNED:		PAGE: _____ OF _____				

This report must be filled out by all contractors (both prime and sub) who are required to have an Affirmative Action Program, and must be filed with the Engineer by the 5th day of each month during the term of the Contract, and shall include the total work hours of each employee classification in each trade in the covered area for the Monthly Reporting Period. The Prime Contractor shall submit a report for its Aggregate Work Force and collect and submit reports for each subcontractor's Aggregate Work Force to the Engineer.

SAMPLE FORMS

SHOP DRAWING SCHEDULE
County of Westchester, Department of Public Works

SHOP DRAWING SCHEDULE											
SPECIFICATION NUMBER	DESCRIPTION OF ITEM/MODEL #	SUBMISSION	REQUEST FROM CONTRACTOR TO MANUFACTURER	RECEIVED BY CONTRACTOR FROM MANUFACTURER	RECEIVED BY COUNTY FROM CONTRACTOR	RETURNED BY COUNTY TO CONTRACTOR	RETURNED BY CONTRACTOR TO MANUFACTURER	APPROVED BY COUNTY	APPROVED SHOP DRAWING MANAGER FROM CONTRACTOR	INVOICE NO. AND SCHEDULED DELIVERY DATE	ACTUAL DELIVERY DATE
		ORIGINAL									
		2									
		3									
		4									
		ORIGINAL									
		2									
		3									
		4									
		ORIGINAL									
		2									
		3									
		4									
		ORIGINAL									
		2									
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		4									
		ORIGINAL									
		2									
		3									
		4									
		ORIGINAL									
		2									
		3									
		4									

SAMPLE FORMS

SHOP DRAWING ID

County of Westchester, Department of Public Works

WESTCHESTER COUNTY DRAWING _____ OF _____

NAME OF PROJECT

Date _____

Contract No. _____

Item/Model No. _____

Manufacturer _____

Contract Drawing No. _____

Specification Section _____

This document has been reviewed, coordinated and checked for accuracy of content and for compliance with the Contract Documents. The information contained herein has been coordinated with all other Contract Work.

Contractor _____

Signed _____

SAMPLE FORMS

CONTRACTOR'S ULTRA LOW SULFUR DIESEL FUEL AFFIDAVIT

County of Westchester, Department of Public Works

Contract No. _____ Period Included in this Report: _____, 20__ to _____, 20__

Title of Contract and Location _____

Contractor _____

Address _____

Subcontractor _____

Address _____

STATE OF _____) ss.:
COUNTY OF _____)

I, _____ being duly sworn, depose and say:
(print name) (print title)

1. I certify under penalty of perjury that I agree to comply with the requirements of Chapter 878, Article XIII, Section 873.13.29 of the Laws of Westchester County.
2. During the period _____ through _____, all diesel-powered vehicles, used in the performance of Contract No. _____, were powered by ultra low sulfur diesel fuel (15 ppm Sulfur Maximum).
3. No fuel other than Ultra Low Sulfur Diesel Fuel (15 ppm Sulfur Maximum) was utilized on this project for the above described vehicles.
4. The annexed Ultra Low Sulfur Diesel Fuel Log is a true and accurate summary of the low sulfur diesel fuel (15 ppm Sulfur Maximum) purchased and utilized in the performance of this project.
5. I have read the foregoing statement, have full knowledge of the contents thereof, and it is my intent that the County of Westchester will rely on the statements contained herein.

(Signature)

STATE OF _____) ss.:
COUNTY OF _____)

On this _____ day of _____, 20__, before me personally came _____ to me known, and known to me to be the person who executed the above instrument, and who being duly sworn did say that he/she executed the same.

Sworn to before me this
_____ day of _____, 20__.

Notary Public

The Ultra Low Sulfur Diesel Fuel-Log must be attached.

This Certification also has to be submitted by your subcontractor(s). *Additional copies of this form can be acquired from the Department of Public Work.*

- New
 Change
 No Change

Electronic Funds Transfer (EFT) Vendor Direct Payment Authorization Form

INSTRUCTIONS: Please complete both sections of this Authorization form and attach a voided check. See the reverse for more information and instructions (Forms Page 21). If you previously submitted this form and there is no change to the information previously submitted, **ONLY** complete lines 1 through 6 of section 1.

Section I - Vendor Information

1. Vendor Name:

2. Taxpayer ID Number or Social Security Number:

--	--	--	--	--	--	--	--	--	--

3. Vendor Primary Address

4. Contact Person Name:

Contact Person Telephone Number:

5. Vendor E-Mail Addresses for Remittance Notification:

6. Vendor Certification: *I have read and understand the Vendor Direct Payment Program and hereby authorize payments to be received by electronic funds transfer into the bank that I designate in Section II. I further understand that in the event that an erroneous electronic payment is sent, Westchester County reserves the right to reverse the electronic payment. In the event that a reversal cannot be implemented, Westchester County will utilize any other lawful means to retrieve payments to which the payee was not entitled.*

Authorized Signature

Print Name/Title

Date

Section II- Financial Institution Information

7. Bank Name:

8. Bank Address:

9. Routing Transit Number:

--	--	--	--	--	--	--	--	--	--

10. Account Type:
(check one)

Checking

Savings

11. Bank Account Number:

12. Bank Account Title:

13. Bank Contact Person Name:

Telephone Number:

14. FINANCIAL INSTITUTION CERTIFICATION (required **ONLY** if directing funds into a Savings Account **OR** if a voided check is not attached to this form): *I certify that the account number and type of account is maintained in the name of the vendor named above. As a representative of the named financial Institution, I certify that this financial Institution is ACH capable and agrees to receive and deposit payments to the account shown.*

Authorized Signature

Print Name / Title

Date

**(Leave Blank - to be completed by
Westchester County) - Vendor number assigned**

--	--	--	--	--	--	--	--	--	--

Electronic Funds Transfer (EFT) Vendor Direct Payment Authorization Form

GENERAL INSTRUCTIONS

Please complete both sections of the Vendor Direct Payment Authorization Form and forward the completed form (along with a voided check for the account to which you want your payments credited) to: Westchester County Board of Acquisition and Contract, 148 Martine Ave, Room 104, White Plains, NY 10601, Attention: Vendor Direct. Please see item 14 below regarding attachment of a voided check.

Section I - VENDOR INFORMATION

1. Provide the name of the vendor as it appears on the W-9 form.
2. Enter the vendor's Taxpayer ID number or Social Security Number as it appears on the W-9 form.
3. Enter the vendor's complete primary address (not a P.O. Box).
4. Provide the name and telephone number of the vendor's contact person.
5. Enter the business e-mail address for the remittance notification. THIS IS VERY IMPORTANT. This is the e-mail address that we will use to send you notification and remittance information two days prior to the payment being credited to your bank account. We suggest that you provide a group mailbox (if applicable) for your e-mail address. You may also designate multiple e-mail addresses.
6. Please have an authorized Payee/Company official sign and date the form and include his/her title.

Section II - FINANCIAL INSTITUTION INFORMATION

7. Provide bank's name.
8. Provide the complete address of your bank.
9. Enter your bank's 9 digit routing transit number.
10. Indicate the type of account (check one box only).
11. Enter the vendor's bank account number.
12. Enter the title of the vendor's account.
13. Provide the name and telephone number of your bank contact person.
14. If you are directing your payments to a Savings Account OR you can not attach a voided check for your checking account, this line needs to be completed and signed by an authorized bank official. IF YOU DO ATTACH A VOIDED CHECK FOR A CHECKING ACCOUNT, YOU MAY LEAVE THIS LINE BLANK.



SAMPLE CONTRACT AND BOND
FOR CONSTRUCTION

DEPARTMENT OF PUBLIC WORKS

Division of Engineering

COUNTY OF WESTCHESTER

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

**COUNTY OFFICE BUILDING/ROOM 500
WHITE PLAINS, NEW YORK**

CONTRACT AND BOND

FOR:

CONTRACT

XX-XXX

**XXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXX, NEW YORK**

SAMPLE

**John Nonna
County Attorney**

CONTRACT NO.:

Amount of Contract: \$

THIS AGREEMENT made this **th** day of , **2022**, by and between the **COUNTY OF WESTCHESTER**, a municipal corporation of the State of New York, hereinafter, “County”, and

hereinafter called the “Contractor”, WITNESSETH as follows:

WHEREAS, the Commissioner of Public Works and Transportation, hereinafter called “Commissioner”, by virtue of the power and authority in him vested did advertise for proposals and bids for:

Westchester County, New York, to furnish all labor, tools, implements and materials that may be requisite and necessary to the execution and completion of the work according to the plans, specifications, profiles and other drawings relating to such work, as approved by the County of Westchester and now on file in the Office of the Commissioner, and

WHEREAS, the Contractor did bid for said work in the manner and form as required by said plans and specifications and, being the lowest responsible bidder therefore, was duly awarded the Contract for such work at prices named in the itemized proposal by a resolution of the Board of Acquisition and Contract of the said County of Westchester.

NOW THEREFORE, the Contractor, in consideration of the prices so named for the various items of work to be paid for as hereinafter provided, does for itself, its representatives, agents, executors, administrators, successors or assigns, covenant and agree with the County that it, the said Contractor, shall and will at its own proper costs and charges and in conformity with said plans and specifications which are made a part of this Contract without setting forth same herein, provide all manner and kind of materials, molds, models, cartage, appliances and appurtenances required and of every description necessary for the due and proper performance of this Contract and the completion of said work to be done under the supervision and direction of the Commissioner, in a good workmanlike manner and in conformity with said plans and specifications without any alteration, deviation, additions, or omissions therefrom except upon due request and under the written direction of said Commissioner.

The Contractor acknowledges receipt of the “Information for Bidders, General and Special Clauses, Specification, Proposal and Plans” relating to this Contract, as well as all issued Addenda thereto, all of which are expressly incorporated in this Contract as if fully set forth herein.

IT IS FURTHER UNDERSTOOD AND AGREED by and between the parties to this Contract that if in the opinion of the said Commissioner of the County of Westchester it shall become necessary to make any change in the work called by the plans and specifications which are a part of this Contract, whereby, consistent with the Information for Bidders, the work contemplated by said plans and specifications is modified and reduced and the costs and expenses of such work lessened, that then and in that event the Contractor will do the work as changed and modified and the said Commissioner shall estimate the difference between the original estimate of quantities therefor and the amount that should be paid by reason of the modification and change and the difference shall be deducted from the original estimate of quantities therefore of said Contract and said Contractor shall be paid accordingly. The estimate of said Commissioner shall be final and conclusive upon the parties hereto and may not be challenged except in a proceeding commenced pursuant to Article 78 of the Civil Practice Law and Rules. Any changes, modifications or deductions shall in no way invalidate this Contract and said Contractor agrees that in the event of any such change or modification reducing the original, estimated quantities therefore, it will not make any claim for any profit, or loss of profit by reason thereof. Notwithstanding any dispute or disagreement arising hereunder, Contractor agrees that the Work shall not be delayed nor disrupted by reason thereof.

The County hereby covenants and agrees with the said Contractor, in consideration of the covenants and agreements herein being strictly and in all respects complied with by the said Contractor as specified, that it will well and truly pay unto the said Contractor the unit prices set forth in the Proposal for the various items included in the Contract.

All partial payments will be made in accordance with the provisions set forth in the “Information for Bidders” and especially that part thereof which relates to “Estimates and Payments”.

Furthermore, all partial payments will be made on the claim voucher and verified certificate of the Commissioner, both of which shall be filed in the Office of the Commissioner of Finance of the County of Westchester. The said claim voucher shall show the value of the work completed and the verified certificate shall show the said work was done in accordance with the plans and specifications.

With the final estimate the Contractor shall furnish to the Construction Administrator a sworn statement listing all unpaid bills and liabilities incurred under this Contract up to and including the date of the estimate. Where there are any bills or liabilities in excess of moneys due under any estimate under this Contract, the Construction Administrator may withhold payment of the estimate pending a satisfactory proof of settlement or adjustment of any excess claims. No final estimate will be approved or passed for payment unless and until the Contractor furnishes satisfactory proof that all bills and liabilities incurred under the Contract are paid in full and complies with the requirements of Section 220-a of the Labor Law.

Acceptance shall be effected as follows: whenever, in the opinion of the Commissioner, the Contractor shall have completely performed the Contract on his part to be performed, the Commissioner shall so certify in writing to the Board of Acquisition and Contract of the County and file such certificate with the said Board, stating therein, in substance that the work has been duly examined by him and that the same has been fully performed and completed in accordance with the terms of the Contract therefor, and recommending the acceptance thereof. When the Board of Acquisition and Contract by resolution duly adopts, approves and ratifies, the said acceptance shall be complete. No final payment shall be made under this Contract until such certificate of completion and recommendation of acceptance have been approved and ratified by a resolution of said Board of Acquisition and Contract.

Unless otherwise provided for in the contract documents, the Commissioner may take over, use, occupy or operate any part of the Work at any time prior to Final Acceptance upon written notification to the Contractor. The Engineer shall inspect the part of the Work to be taken over, used, occupied or operated, and will furnish the Contractor with a written statement of the Work, if any, that remains to be performed on such part. The Contractor shall not object to, nor interfere with, the Commissioner's decision to exercise the rights granted herein. In the event the Commissioner takes over, uses, occupies or operates any part of the work: (i) the Commissioner shall issue a written determination of Substantial Completion with respect to such part of the Work; and (ii) the Contractor shall be relieved of its absolute obligation to protect such part of the unfinished work in accordance with Article 19 of the General Clauses.

The Commissioner will approve a final estimate for final payment consistent with the authorization of final acceptance from the Board of Acquisition and Contract less previous payments and any and all deductions authorized to be made by the Commissioner under the Contract or law. Payment pursuant to such final estimate less any additional deductions authorized to be made by the Commissioner of Finance under the Contract or law shall constitute the final payment and shall be made by the Commissioner of Finance. If the contract is terminated prior to final acceptance the Commissioner is authorized to prepare a final payment as otherwise authorized by the Board of Acquisition and Contract subject to the above noted adjustments.

Upon the completion and acceptance of this Contract by the Board of Acquisition and Contract, as aforesaid, the Commissioner shall proceed with all reasonable diligence to ascertain from actual measurements the whole amount of work done by the Contractor, and also the value of such work under and according to the terms of this Contract, and thereupon make out in writing a final estimate therefor.

After the completion and acceptance as herein above-mentioned, the Commissioner of Public Works and Transportation shall file with the Commissioner of Finance of the County of Westchester the original verified certificate, claim voucher and the certification required by Section 220-a of the Labor Law, together with a certified copy of the resolution of approval and ratification of the Board of Acquisition and Contract of the said verified certificate and claim voucher and the resolution of acceptance of completion.

IT IS FURTHER UNDERSTOOD AND AGREED by and between the parties to this Contract that the Contractor will accept the unit prices named in the proposal for all additions to or deductions from the original quantities as given in the specifications. It is agreed that the Commissioner will make estimates of the value for the work completed as provided in the specifications and the final estimate will be made accordingly.

The Contractor further agrees that if at any time before or within thirty days after the whole of the work herein agreed to be performed has been completed and accepted any person or persons claiming to have performed any labor or furnished any material towards the performance and completion of this contract shall file with the proper officials any such notice as is described in the Lien Law, or any other act of the Legislature of the State of New York, the Contractor shall cause such Lien to be discharged of record. Otherwise and in every case and until the Lien is discharge of record the County shall retain, anything herein to the contrary notwithstanding, from the moneys under its control and due or to grow due under this Contract the sum of one hundred fifty (150%) percent of the amount of such Lien, unless otherwise authorized to withhold a larger amount. The Contractor further agrees to pay the County upon demand the costs, including but not limited to attorney's fees, incurred by the County in any action(s) brought to foreclose or otherwise enforce said Lien.

The term of this Agreement shall commence on **August 25, 2022** and shall terminate on **August 20, 2025**. It is recognized and understood by the parties that the above Agreement termination date is solely for accounting purposes to allow for final closeout of this Agreement. Accordingly, the Contractor covenants and agrees to commence the work embraced in this Agreement on the Agreement commencement date and to complete said work in all respects on or before the work completion date set forth the General Requirements section of this Agreement.

It is further understood and agreed by the parties hereto that the time of completion is of the essence of this Contract.

It is further understood and agreed by the Contractor that before entering upon the performance of this Contract it shall have approved by the County Attorney the Bond required to be furnished by it in the sum of --- **FOUR MILLION ONE HUNDRED FIFTY THOUSAND NINE HUNDRED DOLLARS-00/100--- [\$4,150,900.00]**-conditioned for the faithful performance of the work.

It is further understood and agreed by the Contractor that, in addition to, and not in limitation of the insurance requirements contained in Schedule "A" entitled "Standard Insurance Provisions", attached hereto and made a part hereof, the Contractor agrees:

(a) that except for the amount, if any, of damage contributed to, caused by or resulting from the sole negligence of the County, the Contractor shall indemnify and hold harmless the County, its officers, employees and agents from and against any and all liability, damage, claims, demands, costs, judgments, fees, attorneys' fees or loss arising directly or indirectly out of the acts or omissions hereunder by the Contractor or third parties under the direction or control of the Contractor; and

(b) to provide defense for and defend, at its sole expense, any and all claims, demands or causes of action directly or indirectly arising out of this Agreement and to bear all other costs and expenses related thereto.

(c) In the event the Contractor does not provide the above defense and indemnification to the County, and such refusal or denial to provide the above defense and indemnification is found to be in breach of this provision, then the Contractor shall reimburse the County's reasonable attorney's fees incurred in connection with the defense of any action, and in connection with enforcing this provision of the Agreement.

The Contractor hereby covenants and agrees to observe the plans, specifications and directions of the Commissioner in the doing of the work provided for under this Contract and to furnish the necessary materials and implements required therefore and to remove condemned material and rubbish as provided by plans and specifications and to employ a competent and sufficient force of workmen to complete the work of this improvement within the time specified. Should the Contractor at any time become insolvent, make an assignment for the benefit of creditors, abandon the Work, reduce its working force to a number which, if maintained, would be insufficient, in the sole opinion of the Commissioner, to complete the Work in accordance with the approved progress schedule; sublet, assign or otherwise dispose of this Contract other than as permitted elsewhere herein, refuse or neglect to supply a sufficiency of properly skilled workmen, or of material of the proper quantity or fail in any respect to prosecute the work with promptness and diligence, or fail in any other way in the performance of any of the agreements herein contained; all the foregoing being deemed acts of default, and such default being certified by the Commissioner, the County of Westchester, acting by the Board of Acquisition and Contract, shall be at liberty after five days written notice to the Contractor to provide any such labor or materials, use any and all sums due or to become due to the Contractor under this Contract, to pay for such labor and material, and if the Commissioner shall certify that such default is sufficient ground for such action, the County of Westchester acting by the Board of Acquisition and Contract, shall also be at liberty to terminate the employment of the Contractor for the said work and to enter upon the premises and take possession for the purpose of completing the work included under this Contract of all materials, tools and appliances thereon and to employ any other person or persons to finish the work and provide the materials therefore. Upon the Contractor's receipt of a notice from the County the Contractor shall immediately discontinue all further operations under this Contract. In case of such termination, the Contractor shall not be entitled to receive any further payment under this Contract until the said work shall be wholly finished, at which time if the unpaid balance of the amount to be paid under this Contract shall exceed the reasonable value of the work performed and the material furnished or the total costs therefor, whichever is greater, in finishing the work, such excess shall be paid by the County of Westchester to the Contractor, but if such expense shall exceed such unpaid balance, the Contractor shall pay the difference to the County.

The expense incurred by the County and the total costs as herein provided either for furnishing materials or for finishing the work and any damage incurred through such default shall be certified by the Commissioner whose certificate thereof shall be final and conclusive

upon the parties and may not be challenged except in a proceeding commenced pursuant to Article 78 of the Civil Practice Law and Rules.

In case the County shall declare the Contractor in default as to a part of the work only, the Contractor shall immediately discontinue such part, shall continue performing the remainder of the Work in strict conformity with the terms of the Contract.

In completing the whole or any part of the Work under the provisions of this Contract, the Commissioner shall have the power to depart from or change or vary the terms and provisions of this Contract. Such departure, change or variation, even to the extent of accepting a lesser or different performance, shall not affect the conclusiveness of the Commissioner's certification of the cost of completion referred to above, nor shall it constitute a defense to an action to recover the amount by which such certificate exceeds the amount which would have been payable to the Contractor hereunder but for his default or partial default.

In addition to termination as provided for above, the County may terminate this Contract for the convenience of the County by written notice to the Contractor from the Commissioner. In such event and upon receipt of such notice the Contractor shall stop work on the date specified in the notice; take such actions as may be necessary to protect and preserve the County's materials and property; cancel all cancelable orders for material and equipment; assign to the County and deliver to the jobsite or any other location designated by the Commissioner any non-cancelable orders for material and equipment that is not capable of use except in the performance of this Contract and which has been specifically fabricated for the sole purpose of this Contract and not incorporated in the Work; and take no action that will increase the amounts payable by the County under this Contract.

In the event the contract is cancelled for the convenience of the County the following provisions shall apply:

(a) For Work completed prior to the notice of termination, the Contractor shall be paid the fair and reasonable value of its work determined by the pro rata portion of the lump sum bid amount based upon the percent completion of the Work as of the date of termination as determined by the Commissioner, plus work completed pursuant to approved change orders, less amounts previously paid. For purposes of determining the pro rata portion of the lump sum bid amount to which the Contractor is entitled, the Contractor's approved bid breakdown pursuant to Article 21 of the Information for Bidders shall be considered but shall not be dispositive as to the fair and reasonable value.

(b) For non-cancelable material and equipment that is not capable of use except in the performance of this Contract and which has been specifically fabricated for the sole purpose of this Contract, but not yet incorporated in the Work, the Contractor shall be paid the fair and reasonable value thereof as determined by the Commissioner, but not more than the Contractor's cost for such material and equipment, plus an additional sum of two (2%) percent of such fair and reasonable value.

(c) In the event the County terminates a lump sum Contract for convenience within thirty (30) days after the Contractor has received the Notice of Award from the County, the Contractor shall be paid one (1%) percent of the difference between the total lump sum bid amount and the total of all payments made prior to the notice of termination plus all payments allowed pursuant to (a) and (b).

(d) On all unit price Contracts, or on unit price items in a Contract, the County will pay the Contractor the sum of (e) and (f) below, less all payments previously made pursuant to this Contract:

(e) For all completed units, the unit price stated in the Contract, and

(f) For units that have been ordered but are only partially completed, the Contractor will be paid (i) a pro rata portion of the unit price as stated in the Contract based upon the percent completion of the unit as determined by the Commissioner and (ii) for non-cancelable material and equipment, payment will be made pursuant to (b), above.

(g) The Commissioner's determination(s) hereunder shall be final, binding and conclusive and subject to review only pursuant to Article 78 of the New York Civil Practice Law and Rules.

(h) The County shall not be liable to the Contractor for any payment or claim if the termination for convenience results in a reduction of thirty (30%) percent or less of the original contract price as bid.

On all Contracts or items in a Contract where time and material records are specified as the basis for payment of the Work, the Contractor shall be paid in accordance with Article 29 of the General Clauses, less all payments previously made pursuant to this Contract.

In no event shall any payments made pursuant to a termination for convenience exceed the Contract price for such items, either individually or collectively.

All payments made pursuant to a termination for convenience shall be in the nature of liquidated damages and shall be accepted by the Contractor in full satisfaction of all claims against the County.

The County may deduct or set off against any sums due and payable arising from a termination for convenience, any claims it may have against the Contractor.

In the event the County terminates the Contractor for default and it is subsequently determined that the Contractor was not in default, said termination shall automatically be converted for all purposes into a termination for convenience.

It is further understood and agreed between the parties hereto that no certificate given or payment made under this Contract, except the final certificate or final payment shall be conclusive evidence of the performance of this Contract either wholly or in part and that no payment shall be construed to be an acceptance of defective work or improper materials. If the Contractor shall fail to replace any defective work or materials, the County may cause such defective materials to be removed and defective work to be replaced and the expense thereof shall be deducted from the amount to be paid the Contractor.

Anything to the contrary in the preceding paragraph notwithstanding, the Contractor is responsible for the repair of defects in materials and workmanship for a period of one year from the date of final acceptance of the work by the Board of Acquisition and Contract, unless a longer term is specified in the specifications.

The Contractor further agrees not to assign, transfer, convey, sublet or otherwise dispose of this Contract, or its right, title or interest in or to the same, or any part hereof without the previous consent in writing of the Board of Acquisition and Contract of the County. Before a Subcontractor shall proceed with any work, the Commissioner must first recommend and the Board of Acquisition and Contract must approve the use of the Subcontractor on this Contract. If a Subcontractor is not approved it may not work on this Contract. The Contractor specifically waives any claim due to the failure or refusal of the Commissioner or the Board of Acquisition and Contract to approve said Subcontractor.

The Contractor agrees to hold himself responsible for any claims made against the County for any infringement of patents by the use of patented articles in the construction and completion of the work or any process connected with the work agreed to be performed under this Contract or of any material used upon the said work, and shall indemnify and save harmless the County for the costs, expenses and damages which the County may be obligated to pay by reason of any infringement of patents used in the construction and completion of the work.

The parties hereto agree that no laborer, workman or mechanic in the employ of the Contractor, Subcontractor or other person doing or contracting to do the whole or part of the work contemplated by the Contract shall be permitted or required to work more than eight hours in any one calendar day or more than five days in any one week except in cases of extraordinary emergency including fire, flood or danger to life or property. No such person shall be so employed more than eight hours in any day or more than five days in any one week except in such emergency. Time lost in any week because of inclement weather by employees engaged in the construction, reconstruction and maintenance of highways outside of the limits of cities and villages may be made up during that week and/or the succeeding three weeks.

The Contractor further agrees to erect and maintain during construction all necessary guards, rails and signals to prevent accidents to persons, vehicles or to the adjoining property and also agrees to use all necessary precautions in blasting and that he will indemnify and save the County of Westchester harmless from all suits and actions of any kind and nature whatsoever from or on account of the construction of said work.

It is further understood and agreed by the parties hereto that should any dispute arise respecting the true construction, interpretation or meaning of the Contract plans, specifications or conditions herein, or the measurements for the payment thereunder, same shall be referred to and decided by the said Commissioner and his decision thereon shall be final and conclusive upon the parties thereto and may not be challenged except in a proceeding commenced pursuant to Article 78 of the Civil Practice Law and Rules. This provision shall also apply to the true value of and duly authorized extra work or any work permitted by agreement in case any work shall be ordered performed, or any work called for shall be so omitted under and upon the direction of said Commissioner.

The Contractor by the submitting of bids and execution of this Contract hereby covenants and agrees that he has examined the plans, specifications and the site work, as to local conditions, difficulties and accuracy of approximate estimate of quantities and does hereby further covenant and agree that he will not make any claim for damages by reason of any such local conditions, difficulties or variation of approximate estimate of quantities.

The Contractor represents and warrants to the County with the knowledge and expectation that this warranty will be relied upon by the County that it is not now participating and has not at any time participated, either directly or through any substantially owned or affiliated person, firm, partnership or corporation, in an international boycott in violation of the provisions of United States Export Administration Act of 1969, 50 USC 2401 et seq. or the regulations promulgated thereunder.

The Contractor further warrants and represents that it is financially solvent, and sufficiently experienced and competent to perform the work and that the facts provided by it to the County in its bid and supporting documents, and contract documents are true and correct in all respects.

This Contract shall become void and any rights of the Contractor hereunder shall be forfeited if, subsequent to the execution hereof, the Contractor is convicted of a violation of the provision of the United States Export Administration Act of 1969, 50 USC 2401 et seq. as amended or has been found upon the final determination of the United States Commerce Department or any other appropriate agency of the United States or the State of New York to have violated such act or regulations.

If the Contractor, any officer, director, or any party holding a controlling interest (defined as five (5%) percent or more, or in the case of a corporation, any stockholder owning five (5%) percent or more of the outstanding shares) is convicted of a crime (excluding Class B and Unclassified Misdemeanors as defined under the New York State Penal Law and their equivalent in any city, state or under Federal law related to the type of services or activities which are the subject matter of this Contract) or if a related or affiliated company, partnership or corporation is convicted of a crime (excluding Class B and Unclassified Misdemeanors as defined above) after this Contract is fully executed, the County shall have the right to terminate this Agreement immediately and without penalty. An "affiliated company" as used herein means any affiliate which is a partnership, corporation, proprietorship, association or other entity (i) in which a 50% or greater ownership interest (as defined below) is directly or indirectly held by the Contractor or

any of its management personnel (as defined below) or directors, (ii) which directly or indirectly holds 50% or more of the ownership interest in the Contractor, (iii) in which an aggregate 20% or greater ownership interest is directly or indirectly held by one or more shareholders (or partners or proprietors, in the case of a partnership or proprietorship) which or who in the aggregate hold a 20% or greater ownership interest in the Contractor, or (iv) which, whether by Contract or otherwise, directly or indirectly controls, is controlled by or is under common control with the Contractor. An "ownership interest" means the ownership, whether legally or beneficially, of the stock of or assets employed by a corporation, of a partnership interest in or assets employed by a partnership or of a similar interest in or assets employed by any other entity. "Management personnel" means executive officers and all other persons, whether or not officers or employees, who perform policy-making functions similar to those of executive officers.

The Contractor represents that at the time of execution of this Contract, no individual or entity, as described above, has been convicted of a crime during the five (5) year period preceding the execution of this Contract.

Pursuant to Chapter 308 of the Laws of Westchester County (Local Law 18-1997), it is the goal of the County to use its best efforts to encourage, promote and increase participation of business enterprises that are owned and controlled by persons of color or women in contracts and projects funded by the County, and to monitor such participation. The parties agree that the Contractor has completed the questionnaire contained in the bid specifications attached hereto as part of this Agreement.

The County believes it is a laudable goal to provide business opportunities to veterans who were disabled while serving our country, and wants to encourage the participation in County contracts of certified business enterprises owned and controlled by service-disabled veterans. As part of the County's program to encourage the participation of such business enterprises in County contracts, and in furtherance of Article 17-B of the New York State Executive Law, the parties agree that the Contractor has completed the questionnaire entitled Questionnaire Regarding Business Enterprises Owned and Controlled by Service-Disabled Veterans contained in the bid specifications attached hereto as part of this Agreement.

It is recognized and understood by the parties that this Contract is subject to appropriation by the Westchester County Board of Legislators. The County shall have no liability under this Contract beyond the funds, if any, that are appropriated and available for payment of the amounts due under this Contract. Notwithstanding the foregoing, the County will do all things lawfully within its power to obtain, maintain and properly request and pursue funds from which payments under this Contract may be made.

The parties hereto for themselves, their legal representatives, successors and assigns, expressly agree that any legal action or proceeding that may arise out of or relating to this Contract shall be brought and maintained only in the courts of the State of New York ("New York State Court") located in the County of Westchester. With respect to any action between the County and Contractor in New York State Court, the Contractor hereby expressly waives and relinquishes any rights it may otherwise have (i) to move to dismiss on grounds of *forum non*

conveniens; (ii) to remove to Federal Court; and (iii) to move for a change of venue to a New York State Court outside of Westchester County.

The Contractor for itself, its legal representatives, successors or assigns expressly agrees that no legal action or proceeding shall lie or be maintained against the County upon any claims based upon or arising out of this Contract unless such action or proceeding shall be commenced within six (6) months of final acceptance of the work by the Board of Acquisition and Contract, or within six (6) months after the termination of this Contract, whichever first occurs.

This Contract and its terms, covenants, obligations, conditions and provisions shall be binding upon all the parties hereto, their legal representatives, successors and assigns.

This Contract shall not be enforceable until it is signed by all parties and approved by the Office of the County Attorney.

SAMPLE

[Intentionally Left Blank.
Signatures to Follow.]

IN WITNESS WHEREOF, the parties hereto have executed this agreement, THE COUNTY OF WESTCHESTER pursuant to law by:

_____ its Commissioner

and the **CONTRACTOR:**

BY _____ its _____
(Type or Print Name) (Type or Print Title)

THE COUNTY OF WESTCHESTER:

BY: _____
Commissioner

CONTRACTOR:

(SEAL)

ELQ INDUSTRIES, INC.

BY: _____
(Signature)

ATTEST
BY: _____
(Signature)

Recommended:

Department of Public Works and Transportation

Approved as to form and manner of execution this _____ day of _____, 2022

County Attorney

**CERTIFICATE OF AUTHORITY
(CORPORATION)**

I, _____
(Officer OTHER THAN officer signing contract)

certify that I am _____ of
(Title)

(Name of Corporation)

a corporation duly organized and in good standing under the _____

(Law under which organized, e.g., the New York Business Corporation Law) named in the foregoing agreement; that

(Person executing Agreement)

who signed said Agreement on behalf of the _____
(Name of Corporation)

was at the time of execution _____ of the Corporation and
(Title of such person)

that said agreement was duly signed for and on behalf of said Corporation by authority of its Board of Directors, thereunto duly authorized and that such authority is in full force and effect at the date of hereof.

(Signature)

STATE OF NEW YORK)

)ss:

COUNTY OF)

On the _____ day of _____, in the year 2022, before me, the undersigned, a Notary Public in and for said State, _____ personally appeared, personally known to me or proved to me on the basis of satisfactory evidence to be the officer described in and who executed the above certificate, who being by me duly sworn did depose and say that he/she resides at _____ and he/she is an officer of said corporation; that he/she is duly authorized to execute said certificate on behalf of said corporation, and that he/she signed his/her name thereto pursuant to such authority.

Notary

Date: _____

SAMPLE

PERFORMANCE AND PAYMENT BOND

Bond No. _____

KNOW ALL BY THESE PRESENT,

that we, _____,
(Insert legal name and address of Contractor)

as Principal (hereinafter, together with its successors, assigns, subcontractors, administrators, executors or any other designees or transferees, collectively the "Principal"), and
_____,
(Insert legal name and address of Surety)

as Surety (hereinafter, together with its successors, assigns, subcontractors, administrators, executors or any other designees or transferees, collectively the "Surety"), are held and firmly bound along with our heirs, executors, administrators, successors and assigns, jointly and severally, unto **THE COUNTY OF WESTCHESTER, 148 Martine Avenue, White Plains, New York 10601**, as Obligee, (hereinafter "Obligee") for payment of the penal sum of _____.

(hereinafter the "Penal Sum"), in lawful money of the United States, as more particularly set forth herein.

Said Penal Sum shall apply separately and independently, in its total amount, to the payment provision and the performance provision of this bond and shall not reduce or limit the right of the Obligee or any other claimant to recover under the other said provision.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Obligee, by resolution of its Board of Acquisition and Contract, has authorized the award of an agreement to the Principal for the work (the "Work") commonly described as:

Contract # _____.

WHEREAS, the Principal has entered into an agreement with the Obligee for performance of the Work in strict accordance with the agreement, its attachments and specifications contained therein; (the agreement with all attachments is hereinafter collectively referred to as the "Contract" and are incorporated herein and made a part hereof by reference); and

WHEREAS, by the terms of the Contract, the Principal is required to furnish a bond ensuring the Principal's prompt, full and faithful performance of the Contract.

NOW THEREFORE, if the Principal shall

(1) promptly, fully and faithfully perform the Work and each and all of the terms and obligations to be carried out and performed by the Principal in strict accordance with the terms, conditions and covenants of the Contract as it may be modified or amended from time to time; and if the Principal shall indemnify and save harmless the Obligee and all of its officers, agents and employees from any and all losses, liability and damages, claims, judgments, liens, costs, and fees of every description, which may be incurred by the Obligee by reason of a default or failure on the part of the Principal in the strict performance of any or all of the terms or obligations of the Contract, including all modifications, and amendments, thereto, and any warranties or guarantees required thereunder; and

(2) also promptly make payment of all wages, labor, services, supplies and material rendered or reasonably required for use in the performance of the Contract, of all persons and firms engaged in the Work provided for in the Contract, whether such persons are agents, servants or employees of the Principal, or any subcontractor or of any assignee or designee thereof, regardless of any contractual relationship between the Principal, or any subcontractor or any designee thereof, and further, shall pay or cause to be paid all lawful claims of subcontractors, materialmen and other third persons in connection with the work, labor, services, supplies and material furnished in and about the performance of the Contract, then this obligation shall be void; otherwise, it shall be, and remain, in full force and effect.

PROVIDED, however, that this bond is subject to the following additional terms and conditions:

The Surety, for value received, hereby stipulates and agrees that no change, adjustment of the time for performance of the Contract, any extension of time, adjustment of the Contract's not-to-exceed amount, any payment whether or not before the time required, any waiver of any provision, or by an assignment, subletting or other transfer of any of the Work, or of payment or non-payment of any moneys due or to become due under the Contract, any alterations, deletions, additions, or any other modifications to the terms of the Contract, the Work to be performed, or to the Contract specifications shall limit, restrict or otherwise impair Surety's obligations or Obligee's rights hereunder; The Surety hereby waives notice of any and all of such changes, modifications to the Contract, including but not limited to extensions of time for performance, adjustments of the Contract not-to-exceed amount, modifications, changes in the Work to be performed, alterations, deletions, omissions, additions, changes, payments, waivers, any changes in time, assignments, subcontracts and transfers; And the Surety hereby stipulates and agrees that any and all actions performed or omitted by and in relation to executors, administrators, successors, assigns, Subcontractors, and other designees, shall have the

same effect as to said Surety as though done or omitted to be done by and in relation to said Principal.

In the event of a failure of strict performance of the Contract by the Principal, which shall include, but not be limited to, any breach or default of the Contract by the Principal, and within fifteen (15) days after written notice from the Oblige to the Surety of the Principal's breach or default of the Contract, the Surety shall provide Oblige with written notice of its assumption of all obligations hereunder and request Oblige's approval of its proposed election ("Notice of Assumption and Election") to either: a) remedy or cause to be remedied the default or breach of the Principal Contract and cause the Principal to immediately commence and timely complete the Contract; or b) to take charge of the Work of the Contract and immediately commence and timely complete the Work at its own expense itself, through its agents or independent qualified contractors proposed by the Surety and acceptable to Oblige; provided, however, that the Surety hereby stipulates and agrees that both its proposed remedy procedure ("a" and "b" above) and proposed independent contractor, if any, in Surety's Notice of Assumption and Election shall be subject to the prior written approval of the Oblige, which approval shall be granted or withheld in the Oblige's sole discretion, and subject to Oblige's receipt of any and all necessary legal approvals. Surety shall, within five (5) days after written approval from the Oblige of Surety's Notice of Assumption and Election, commence or cause to be commenced the completion of the Work in strict accordance with its Notice of Assumption and Election and the terms, conditions and covenants of the Contract as they may be modified or amended from time to time, time being of the essence for the performance of the Work and this bond. The Surety shall not assert solvency/insolvency of the Principal or the Principal's denial of default as justification for its failure to give the Notice of Assumption and Election, or for its failure to promptly remedy the failure of performance or default of the Principal, or to complete the Work.

In the event the Surety shall fail to issue the Notice of Assumption and Election to Oblige and/or Surety fails to commence completion of the Work within the time periods provided above, the Oblige may thereafter cause the cure or remedy of the Principal's failure of performance or default, or complete the Work. The Principal and the Surety shall be each jointly and severally liable to the Oblige for all damages and costs sustained by the Oblige as a result of the Principal's failure of performance under the Contract or default in its performance of obligations thereunder, including without limitation the costs of cure or completion exceeding the then remaining balance of the Contract Price, and any other remedy available to Oblige; provided that the Surety's liability hereunder for the costs of performance, damages and other costs sustained by the Oblige upon the Principal's failure of performance under or default under the Contract shall be limited to the Penal Sum hereof, which shall be deemed to include the costs or value of any modifications to the Work which increases the Contract Price, plus the amount of costs, expenses and fees, including reasonable attorneys' fees in connection with any suit or other proceeding brought upon this bond by the Oblige, as more particularly set forth herein.

All persons who have performed labor or rendered services, as aforesaid, all subcontractors, and all persons, firms, corporations, including materialmen and third persons, as aforesaid, furnishing work, labor, services, supplies and material under or in connection with said Contract or in or about the performance and completion thereof, shall have a direct right of action (subject to the prior right of the Obligee under any claim which it may assert against the Principal and/or the Surety) against the Principal on this bond, upon first furnishing the Obligee with a Bond of Indemnity for costs in an amount satisfactory to the Obligee, which right of action shall be asserted in proceedings instituted in the State in which such work, labor, services, supplies or material was performed, rendered or furnished or where work, labor, services, supplies or material has been performed, rendered or furnished, as aforesaid, in more than one State, than in any such State, no later than one (1) year after the complete performance of said Contract and final settlement thereof.

The Surety shall not be liable hereunder for any damages or compensation recoverable under any worker's compensation or employer's liability statute.

In no event shall the Surety be liable under the foregoing clauses for a greater sum than the Penal Sum of this bond, plus the amount of costs, expenses and fees, including reasonable attorneys' fees in connection with any suit or other proceeding brought upon this bond by the Obligee, as more particularly set forth herein, provided; however, that said Penal Sum is separately and independently applicable, in its total amount to the payment provision and the performance provision of this bond, and shall not reduce or limit the right of the Obligee to recover under the other said provision, or reduce or limit any suit, action or proceeding hereon that is instituted by any person, firm or corporation under the provisions of the payment provision of this bond. The Principal and the Surety do hereby expressly waive any objections that might be interposed as to the right of the Obligee to require a bond containing the foregoing provisions, and they do hereby further expressly waive any defense which they or either of them might interpose to an action brought hereon by any person, firm or corporation, including Subcontractors, materialmen, and third persons, for work, labor, services, supplies or material performed, rendered or furnished as aforesaid, upon the ground that there is no law authorizing the said Obligee to require the foregoing provision to be placed in this Bond.

Notices to the Surety, Principal and Obligee shall be mailed via certified mail, return receipt requested, or delivered to the addresses shown in the preamble. Notice shall be effective on the date of receipt.

The Penal Sum of this bond is in addition to any other bond furnished by the Principal to the Obligee and in no way shall be impaired or affected by any other bond.

In the event that any suit or other proceeding is brought upon this bond by the Obligee, the Surety shall pay to the Obligee all costs, expenses and fees incurred by the Obligee in connection therewith, including without limitation, attorneys' fees.

[NO FURTHER TEXT ON THIS PAGE. SIGNATURE PAGE FOLLOWS.]

SAMPLE

IN WITNESS WHEREOF, the Principal and Surety have executed this Performance and Payment Bond this _____ day of _____, 20__, by their duly authorized agents or representatives.

PRINCIPAL:

(Corporate Seal)

Principal Name and Title

Principal Signature

SURETY:

(Corporate Seal)

Surety Name

Surety Signature

(Attach Attorney-in-Fact Certificate)

If the Contractor (Principal) is a partnership, the Bond should be signed by each of the individuals who are partners.

If the Contractor (Principal) is a Corporation, the Bond should be signed in its correct corporate name by a duly authorized officer, agent, or attorney-in-fact.

There should be executed an appropriate number of counterparts of the Bond corresponding to the number of counterparts of the Contract.

Each executed Bond should be accompanied by:

- (a) appropriate acknowledgments of the respective parties;
- (b) appropriate duly certified copy of Power of Attorney or other Certificate of Authority where the Bond is executed by agent, officer or other representative of Principal or Surety;
- (c) a duly certified extract from By-laws or resolutions of Surety under which Power of Attorney or other Certificate of Authority of its agent, officer or representative was issued, and
- (d) duly certified copy of latest published financial statement of assets and liabilities of Surety.

SCHEDULE "A"

STANDARD INSURANCE PROVISIONS
(Contractor)

1. Prior to commencing work, and throughout the term of the Agreement, the Contractor shall obtain at its own cost and expense the required insurance as delineated below from insurance companies licensed in the State of New York, carrying a Best's financial rating of A or better. Contractor shall provide evidence of such insurance to the County of Westchester ("County"), either by providing a copy of policies and/or certificates as may be required and approved by the Director of Risk Management of the County ("Director"). The policies or certificates thereof shall provide that ten (10) days prior to cancellation or material change in the policy, notices of same shall be given to the Director either by overnight mail or personal delivery for all of the following stated insurance policies. All notices shall name the Contractor and identify the Agreement.

If at any time any of the policies required herein shall be or become unsatisfactory to the Director, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Director, the Contractor shall upon notice to that effect from the County, promptly obtain a new policy, and submit the policy or the certificate as requested by the Director to the Office of Risk Management of the County for approval by the Director. Upon failure of the Contractor to furnish, deliver and maintain such insurance, the Agreement, at the election of the County, may be declared suspended, discontinued or terminated.

Failure of the Contractor to take out, maintain, or the taking out or maintenance of any required insurance, shall not relieve the Contractor from any liability under the Agreement, nor shall the insurance requirements be construed to conflict with or otherwise limit the contractual obligations of the Contractor concerning indemnification.

All property losses shall be made payable to the "County of Westchester" and adjusted with the appropriate County personnel.

In the event that claims, for which the County may be liable, in excess of the insured amounts provided herein are filed by reason of Contractor's negligent acts or omissions under the Agreement or by virtue of the provisions of the labor law or other statute or any other reason, the amount of excess of such claims or any portion thereof, may be withheld from payment due or to become due the Contractor until such time as the Contractor shall furnish such additional security covering such claims in form satisfactory to the Director.

In the event of any loss, if the Contractor maintains broader coverage and/or higher limits than the minimums identified herein, the County shall be entitled to the broader coverage and/or higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the County.

2. The Contractor shall provide proof of the following coverage (if additional coverage is required for a specific agreement, those requirements will be described in the Agreement):

- a) Workers' Compensation and Employer's Liability. Certificate form C-105.2 or State Fund Insurance Company form U-26.3 is required for proof of compliance with the New York State Workers' Compensation Law. State Workers' Compensation Board form DB-120.1 is required for proof of compliance with the New York State Disability Benefits Law. Location of operation shall be "All locations in Westchester County, New York."

Where an applicant claims to not be required to carry either a Workers' Compensation Policy or Disability Benefits Policy, or both, the employer must complete NYS form CE-200, available to download at: <http://www.wcb.ny.gov>.

If the employer is self-insured for Workers' Compensation, he/she should present a certificate from the New York State Worker's Compensation Board evidencing that fact (Either SI-12, Certificate of Workers' Compensation Self-Insurance, or GSI-105.2, Certificate of Participation in Workers' Compensation Group Self-Insurance).

- b) Commercial General Liability Insurance with a combined single limit of \$1,000,000 (c.s.1) per occurrence and a \$2,000,000 aggregate limit naming the "County of Westchester" as an additional insured on a primary and non-contributory basis. This insurance shall include the following coverages:

- i. Premises - Operations.
- ii. Broad Form Contractual.
- iii. Independent Contractor and Sub-Contractor.
- iv. Products and Completed Operations.

- c) Commercial Umbrella/Excess Insurance: \$2,000,000 each Occurrence and Aggregate naming the "County of Westchester" as additional insured, written on a "follow the form" basis.

NOTE: Additional insured status shall be provided by standard or other endorsement that extends coverage to the County for both on-going and completed operations.

All Contracts involving the use of explosives, demolition and/or underground work shall provide proof that XCU is covered.

- d) Automobile Liability Insurance with a minimum limit of liability per occurrence of \$1,000,000 for bodily injury and a minimum limit of \$100,000 per occurrence for property damage or a combined single limit of \$1,000,000 unless otherwise indicated in the contract specifications. This insurance shall include for bodily injury and property damage the following coverages and name the "County of Westchester" as additional insured:

- (i) Owned automobiles.
- (ii) Hired automobiles.
- (iii) Non-owned automobiles.

- e) With regard to the insurance coverage provided for in Section 2, subsections b), c) and d) above, in addition to naming the “County of Westchester” as an additional insured, the Contractor shall also name “Standard Amusements LLC” as an additional insured with regard to any contract, work or project to be performed at Playland Park in Rye, New York, on the same terms and conditions as provided for the benefit of the County of Westchester.

3. All policies of the Contractor shall be endorsed to contain the following clauses:

(a) Insurers shall have no right to recovery or subrogation against the County (including its employees and other agents and agencies), it being the intention of the parties that the insurance policies so effected shall protect both parties and be primary coverage for any and all losses covered by the above-described insurance.

(b) The clause "other insurance provisions" in a policy in which the County is named as an insured, shall not apply to the County.

(c) The insurance companies issuing the policy or policies shall have no recourse against the County (including its agents and agencies as aforesaid) for payment of any premiums or for assessments under any form of policy.

(d) Any and all deductibles in the above described insurance policies shall be assumed by and be for the account of, and at the sole risk of, the Contractor.

Certificate Holder should only read: The County of Westchester, 148 Martine Avenue, White Plains, New York 10601

PLEASE NOTE: A printed copy of your full insurance policy is required



SCHEDULE OF HOURLY RATES
AND SUPPLEMENTS

DEPARTMENT OF PUBLIC WORKS

Division of Engineering



Kathy Hochul, Governor

Roberta Reardon, Commissioner

Westchester County DPW & T

Yolanda Spraggins, Secretary II
148 Martine Ave., Rm 518
White Plains NY 10601

Schedule Year 2022 through 2023
Date Requested 08/18/2022
PRC# 2022009700

Location Westchester County Airport
Project ID# 22-522
Project Type Domestic Water System Improvements, Westchester County Airport, Towns of Harrison and North Castle and Village of Rye Brook, NY

PREVAILING WAGE SCHEDULE FOR ARTICLE 8 PUBLIC WORK PROJECT

Attached is the current schedule(s) of the prevailing wage rates and prevailing hourly supplements for the project referenced above. A unique Prevailing Wage Case Number (PRC#) has been assigned to the schedule(s) for your project.

The schedule is effective from July 2022 through June 2023. All updates, corrections, posted on the 1st business day of each month, and future copies of the annual determination are available on the Department's website www.labor.ny.gov. Updated PDF copies of your schedule can be accessed by entering your assigned PRC# at the proper location on the website.

It is the responsibility of the contracting agency or its agent to annex and make part, the attached schedule, to the specifications for this project, when it is advertised for bids and /or to forward said schedules to the successful bidder(s), immediately upon receipt, in order to insure the proper payment of wages.

Please refer to the "General Provisions of Laws Covering Workers on Public Work Contracts" provided with this schedule, for the specific details relating to other responsibilities of the Department of Jurisdiction.

Upon completion or cancellation of this project, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

NOTICE OF COMPLETION / CANCELLATION OF PROJECT

Date Completed: _____ Date Cancelled: _____

Name & Title of Representative: _____

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240

General Provisions of Laws Covering Workers on Article 8 Public Work Contracts

Introduction

The Labor Law requires public work contractors and subcontractors to pay laborers, workers, or mechanics employed in the performance of a public work contract not less than the prevailing rate of wage and supplements (fringe benefits) in the locality where the work is performed.

Responsibilities of the Department of Jurisdiction

A Department of Jurisdiction (Contracting Agency) includes a state department, agency, board or commission; a county, city, town or village; a school district, board of education or board of cooperative educational services; a sewer, water, fire, improvement and other district corporation; a public benefit corporation; and a public authority awarding a public work contract.

The Department of Jurisdiction (Contracting Agency) awarding a public work contract MUST obtain a Prevailing Rate Schedule listing the hourly rates of wages and supplements due the workers to be employed on a public work project. This schedule may be obtained by completing and forwarding a "Request for wage and Supplement Information" form (PW 39) to the Bureau of Public Work. The Prevailing Rate Schedule MUST be included in the specifications for the contract to be awarded and is deemed part of the public work contract.

Upon the awarding of the contract, the law requires that the Department of Jurisdiction (Contracting Agency) furnish the following information to the Bureau: the name and address of the contractor, the date the contract was let and the approximate dollar value of the contract. To facilitate compliance with this provision of the Labor Law, a copy of the Department's "Notice of Contract Award" form (PW 16) is provided with the original Prevailing Rate Schedule.

The Department of Jurisdiction (Contracting Agency) is required to notify the Bureau of the completion or cancellation of any public work project. The Department's PW 200 form is provided for that purpose.

Both the PW 16 and PW 200 forms are available for completion [online](#).

Hours

No laborer, worker, or mechanic in the employ of a contractor or subcontractor engaged in the performance of any public work project shall be permitted to work more than eight hours in any day or more than five days in any week, except in cases of extraordinary emergency. The contractor and the Department of Jurisdiction (Contracting Agency) may apply to the Bureau of Public Work for a dispensation permitting workers to work additional hours or days per week on a particular public work project.

There are very few exceptions to this rule. Complete information regarding these exceptions is available on the ["Request for a dispensation to work overtime" form \(PW30\)](#) and ["4 Day / 10 Hour Work Schedule" form \(PW 30.1\)](#).

Wages and Supplements

The wages and supplements to be paid and/or provided to laborers, workers, and mechanics employed on a public work project shall be not less than those listed in the current Prevailing Rate Schedule for the locality where the work is performed. If a prime contractor on a public work project has not been provided with a Prevailing Rate Schedule, the contractor must notify the Department of Jurisdiction (Contracting Agency) who in turn must request an original Prevailing Rate Schedule form the Bureau of Public Work. Requests may be submitted by: mail to NYSDOL, Bureau of Public Work, State Office Bldg. Campus, Bldg. 12, Rm. 130, Albany, NY 12240; Fax to Bureau of Public Work (518) 485-1870; or electronically at the NYSDOL website www.labor.ny.gov.

Upon receiving the original schedule, the Department of Jurisdiction (Contracting Agency) is REQUIRED to provide complete copies to all prime contractors who in turn MUST, by law, provide copies of all applicable county schedules to each subcontractor and obtain from each subcontractor, an affidavit certifying such schedules were received. If the original schedule expired, the contractor may obtain a copy of the new annual determination from the NYSDOL website www.labor.ny.gov.

The Commissioner of Labor makes an annual determination of the prevailing rates. This determination is in effect from July 1st through June 30th of the following year. The annual determination is available on the NYSDOL website www.labor.ny.gov.

Payrolls and Payroll Records

Every contractor and subcontractor MUST keep original payrolls or transcripts subscribed and affirmed as true under penalty of perjury. As per Article 6 of the Labor law, contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records. At a minimum, payrolls must show the following information for each person employed on a public work project: Name, Address, Last 4 Digits of Social Security Number, Classification(s) in which the worker was employed, Hourly wage rate(s) paid, Supplements paid

or provided, and Daily and weekly number of hours worked in each classification.

The filing of payrolls to the Department of Jurisdiction is a condition of payment. Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury. The Department of Jurisdiction (Contracting Agency) shall collect, review for facial validity, and maintain such payrolls.

In addition, the Commissioner of Labor may require contractors to furnish, with ten (10) days of a request, payroll records sworn to as their validity and accuracy for public work and private work. Payroll records include, but are not limited to time cards, work description sheets, proof that supplements were provided, cancelled payroll checks and payrolls. Failure to provide the requested information within the allotted ten (10) days will result in the withholding of up to 25% of the contract, not to exceed \$100,000.00. If the contractor or subcontractor does not maintain a place of business in New York State and the amount of the contract exceeds \$25,000.00, payroll records and certifications must be kept on the project worksite.

The prime contractor is responsible for any underpayments of prevailing wages or supplements by any subcontractor.

All contractors or their subcontractors shall provide to their subcontractors a copy of the Prevailing Rate Schedule specified in the public work contract as well as any subsequently issued schedules. A failure to provide these schedules by a contractor or subcontractor is a violation of Article 8, Section 220-a of the Labor Law.

All subcontractors engaged by a public work project contractor or its subcontractor, upon receipt of the original schedule and any subsequently issued schedules, shall provide to such contractor a verified statement attesting that the subcontractor has received the Prevailing Rate Schedule and will pay or provide the applicable rates of wages and supplements specified therein. (See NYS Labor Laws, Article 8 . Section 220-a).

Determination of Prevailing Wage and Supplement Rate Updates Applicable to All Counties

The wages and supplements contained in the annual determination become effective July 1st whether or not the new determination has been received by a given contractor. Care should be taken to review the rates for obvious errors. Any corrections should be brought to the Department's attention immediately. It is the responsibility of the public work contractor to use the proper rates. If there is a question on the proper classification to be used, please call the district office located nearest the project. Any errors in the annual determination will be corrected and posted to the NYSDOL website on the first business day of each month. Contractors are responsible for paying these updated rates as well, retroactive to July 1st.

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. To the extent possible, the Department posts rates in its possession that cover periods of time beyond the July 1st to June 30th time frame covered by a particular annual determination. Rates that extend beyond that instant time period are informational ONLY and may be updated in future annual determinations that actually cover the then appropriate July 1st to June 30th time period.

Withholding of Payments

When a complaint is filed with the Commissioner of Labor alleging the failure of a contractor or subcontractor to pay or provide the prevailing wages or supplements, or when the Commissioner of Labor believes that unpaid wages or supplements may be due, payments on the public work contract shall be withheld from the prime contractor in a sufficient amount to satisfy the alleged unpaid wages and supplements, including interest and civil penalty, pending a final determination.

When the Bureau of Public Work finds that a contractor or subcontractor on a public work project failed to pay or provide the requisite prevailing wages or supplements, the Bureau is authorized by Sections 220-b and 235.2 of the Labor Law to so notify the financial officer of the Department of Jurisdiction (Contracting Agency) that awarded the public work contract. Such officer MUST then withhold or cause to be withheld from any payment due the prime contractor on account of such contract the amount indicated by the Bureau as sufficient to satisfy the unpaid wages and supplements, including interest and any civil penalty that may be assessed by the Commissioner of Labor. The withholding continues until there is a final determination of the underpayment by the Commissioner of Labor or by the court in the event a legal proceeding is instituted for review of the determination of the Commissioner of Labor.

The Department of Jurisdiction (Contracting Agency) shall comply with this order of the Commissioner of Labor or of the court with respect to the release of the funds so withheld.

Summary of Notice Posting Requirements

The current Prevailing Rate Schedule must be posted in a prominent and accessible place on the site of the public work project. The prevailing wage schedule must be encased in, or constructed of, materials capable of withstanding adverse weather conditions and be titled "PREVAILING RATE OF WAGES" in letters no smaller than two (2) inches by two (2) inches.

The "Public Work Project" notice must be posted at the beginning of the performance of every public work contract, on each job site.

Every employer providing workers' compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

Every employer subject to the NYS Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers, notices furnished by the State Division of Human Rights.

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the NYS Department of Labor.

Apprentices

Employees cannot be paid apprentice rates unless they are individually registered in a program registered with the NYS Commissioner of Labor. The allowable ratio of apprentices to journeyworkers in any craft classification can be no greater than the statewide building trade ratios promulgated by the Department of Labor and included with the Prevailing Rate Schedule. An employee listed on a payroll as an apprentice who is not registered as above or is performing work outside the classification of work for which the apprentice is indentured, must be paid the prevailing journeyworker's wage rate for the classification of work the employee is actually performing.

NYSDOL Labor Law, Article 8, Section 220-3, require that only apprentices individually registered with the NYS Department of Labor may be paid apprenticeship rates on a public work project. No other Federal or State Agency of office registers apprentices in New York State.

Persons wishing to verify the apprentice registration of any person must do so in writing by mail, to the NYSDOL Office of Employability Development / Apprenticeship Training, State Office Bldg. Campus, Bldg. 12, Albany, NY 12240 or by Fax to NYSDOL Apprenticeship Training (518) 457-7154. All requests for verification must include the name and social security number of the person for whom the information is requested.

The only conclusive proof of individual apprentice registration is written verification from the NYSDOL Apprenticeship Training Albany Central office. Neither Federal nor State Apprenticeship Training offices outside of Albany can provide conclusive registration information.

It should be noted that the existence of a registered apprenticeship program is not conclusive proof that any person is registered in that program. Furthermore, the existence or possession of wallet cards, identification cards, or copies of state forms is not conclusive proof of the registration of any person as an apprentice.

Interest and Penalties

In the event that an underpayment of wages and/or supplements is found:

- Interest shall be assessed at the rate then in effect as prescribed by the Superintendent of Banks pursuant to section 14-a of the Banking Law, per annum from the date of underpayment to the date restitution is made.
- A Civil Penalty may also be assessed, not to exceed 25% of the total of wages, supplements, and interest due.

Debarment

Any contractor or subcontractor and/or its successor shall be ineligible to submit a bid on or be awarded any public work contract or subcontract with any state, municipal corporation or public body for a period of five (5) years when:

- Two (2) willful determinations have been rendered against that contractor or subcontractor and/or its successor within any consecutive six (6) year period.
- There is any willful determination that involves the falsification of payroll records or the kickback of wages or supplements.

Criminal Sanctions

Willful violations of the Prevailing Wage Law (Article 8 of the Labor Law) may be a felony punishable by fine or imprisonment of up to 15 years, or both.

Discrimination

No employee or applicant for employment may be discriminated against on account of age, race, creed, color, national origin, sex, disability or marital status.

No contractor, subcontractor nor any person acting on its behalf, shall by reason of race, creed, color, disability, sex or national origin discriminate against any citizen of the State of New York who is qualified and available to perform the work to which the employment relates (NYS Labor Law, Article 8, Section 220-e(a)).

No contractor, subcontractor, nor any person acting on its behalf, shall in any manner, discriminate against or intimidate any employee on account of race, creed, color, disability, sex, or national origin (NYS Labor Law, Article 8, Section 220-e(b)).

The Human Rights Law also prohibits discrimination in employment because of age, marital status, or religion.

There may be deducted from the amount payable to the contractor under the contract a penalty of \$50.00 for each calendar day during which such person was discriminated against or intimidated in violation of the provision of the contract (NYS Labor Law, Article 8, Section 220-e(c)).

The contract may be cancelled or terminated by the State or municipality. All monies due or to become due thereunder may be forfeited for a second or any subsequent violation of the terms or conditions of the anti-discrimination sections of the contract (NYS Labor Law, Article 8, Section 220-e(d)).

Every employer subject to the New York State Human Rights Law must conspicuously post at its offices, places of employment, or employment training centers notices furnished by the State Division of Human Rights.

Workers' Compensation

In accordance with Section 142 of the State Finance Law, the contractor shall maintain coverage during the life of the contract for the benefit of such employees as required by the provisions of the New York State Workers' Compensation Law.

A contractor who is awarded a public work contract must provide proof of workers' compensation coverage prior to being allowed to begin work.

The insurance policy must be issued by a company authorized to provide workers' compensation coverage in New York State. Proof of coverage must be on form C-105.2 (Certificate of Workers' Compensation Insurance) and must name this agency as a certificate holder.

If New York State coverage is added to an existing out-of-state policy, it can only be added to a policy from a company authorized to write workers' compensation coverage in this state. The coverage must be listed under item 3A of the information page.

The contractor must maintain proof that subcontractors doing work covered under this contract secured and maintained a workers' compensation policy for all employees working in New York State.

Every employer providing worker's compensation insurance and disability benefits must post notices of such coverage in the format prescribed by the Workers' Compensation Board in a conspicuous place on the jobsite.

Unemployment Insurance

Employers liable for contributions under the Unemployment Insurance Law must conspicuously post on the jobsite notices furnished by the New York State Department of Labor.



Kathy Hochul, Governor

Roberta Reardon, Commissioner

Westchester County DPW & T

Yolanda Spraggins, Secretary II
148 Martine Ave., Rm 518
White Plains NY 10601

Schedule Year 2022 through 2023
Date Requested 08/18/2022
PRC# 2022009700

Location Westchester County Airport
Project ID# 22-522
Project Type Domestic Water System Improvements, Westchester County Airport, Towns of Harrison and North Castle and Village of Rye Brook, NY

Notice of Contract Award

New York State Labor Law, Article 8, Section 220.3a requires that certain information regarding the awarding of public work contracts, be furnished to the Commissioner of Labor. One "Notice of Contract Award" (PW 16, which may be photocopied), **MUST** be completed for **EACH** prime contractor on the above referenced project.

Upon notifying the successful bidder(s) of this contract, enter the required information and mail **OR** fax this form to the office shown at the bottom of this notice, **OR** fill out the electronic version via the NYSDOL website.

Contractor Information

All information must be supplied

Federal Employer Identification Number: _____		
Name: _____		
Address: _____ _____		
City: _____	State: _____	Zip: _____
Amount of Contract: \$ _____	Contract Type:	
Approximate Starting Date: ____/____/____	<input type="checkbox"/> (01) General Construction	
Approximate Completion Date: ____/____/____	<input type="checkbox"/> (02) Heating/Ventilation	
	<input type="checkbox"/> (03) Electrical	
	<input type="checkbox"/> (04) Plumbing	
	<input type="checkbox"/> (05) Other : _____	

Phone: (518) 457-5589 Fax: (518) 485-1870
W. Averell Harriman State Office Campus, Bldg. 12, Room 130, Albany, NY 12240

Social Security Numbers on Certified Payrolls:

The Department of Labor is cognizant of the concerns of the potential for misuse or inadvertent disclosure of social security numbers. Identity theft is a growing problem and we are sympathetic to contractors' concern regarding inclusion of this information on payrolls if another identifier will suffice.

For these reasons, the substitution of the use of the last four digits of the social security number on certified payrolls submitted to contracting agencies on public work projects is now acceptable to the Department of Labor. This change does not affect the Department's ability to request and receive the entire social security number from employers during its public work/ prevailing wage investigations.

Construction Industry Fair Play Act: Required Posting for Labor Law Article 25-B § 861-d

Construction industry employers must post the "Construction Industry Fair Play Act" notice in a prominent and accessible place on the job site. Failure to post the notice can result in penalties of up to \$1,500 for a first offense and up to \$5,000 for a second offense. The posting is included as part of this wage schedule. Additional copies may be obtained from the NYS DOL website, <https://dol.ny.gov/public-work-and-prevailing-wage>

If you have any questions concerning the Fair Play Act, please call the State Labor Department toll-free at 1-866-435-1499 or email us at: dol.misclassified@labor.ny.gov .

Worker Notification: (Labor Law §220, paragraph a of subdivision 3-a)

Effective June 23, 2020

This provision is an addition to the existing wage rate law, Labor Law §220, paragraph a of subdivision 3-a. It requires contractors and subcontractors to provide written notice to all laborers, workers or mechanics of the *prevailing wage and supplement rate* for their particular job classification *on each pay stub**. It also requires contractors and subcontractors to *post a notice* at the beginning of the performance of every public work contract *on each job site* that includes the telephone number and address for the Department of Labor and a statement informing laborers, workers or mechanics of their right to contact the Department of Labor if he/she is not receiving the proper prevailing rate of wages and/or supplements for his/her job classification. The required notification will be provided with each wage schedule, may be downloaded from our website www.labor.ny.gov or be made available upon request by contacting the Bureau of Public Work at 518-457-5589. *In the event the required information will not fit on the pay stub, an accompanying sheet or attachment of the information will suffice.

(12.20)

**To all State Departments, Agency Heads and Public Benefit Corporations
IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

Budget Policy & Reporting Manual

B-610

Public Work Enforcement Fund

effective date December 7, 2005

1. Purpose and Scope:

This Item describes the Public Work Enforcement Fund (the Fund, PWEF) and its relevance to State agencies and public benefit corporations engaged in construction or reconstruction contracts, maintenance and repair, and announces the recently-enacted increase to the percentage of the dollar value of such contracts that must be deposited into the Fund. This item also describes the roles of the following entities with respect to the Fund:

- New York State Department of Labor (DOL),
- The Office of the State of Comptroller (OSC), and
- State agencies and public benefit corporations.

2. Background and Statutory References:

DOL uses the Fund to enforce the State's Labor Law as it relates to contracts for construction or reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law. State agencies and public benefit corporations participating in such contracts are required to make payments to the Fund.

Chapter 511 of the Laws of 1995 (as amended by Chapter 513 of the Laws of 1997, Chapter 655 of the Laws of 1999, Chapter 376 of the Laws of 2003 and Chapter 407 of the Laws of 2005) established the Fund.

3. Procedures and Agency Responsibilities:

The Fund is supported by transfers and deposits based on the value of contracts for construction and reconstruction, maintenance and repair, as defined in subdivision two of Section 220 of the Labor Law, into which all State agencies and public benefit corporations enter.

Chapter 407 of the Laws of 2005 increased the amount required to be provided to this fund to .10 of one-percent of the total cost of each such contract, to be calculated at the time agencies or public benefit corporations enter into a new contract or if a contract is amended. The provisions of this bill became effective August 2, 2005.

**To all State Departments, Agency Heads and Public Benefit Corporations
IMPORTANT NOTICE REGARDING PUBLIC WORK ENFORCEMENT FUND**

OSC will report to DOL on all construction-related ("D") contracts approved during the month, including contract amendments, and then DOL will bill agencies the appropriate assessment monthly. An agency may then make a determination if any of the billed contracts are exempt and so note on the bill submitted back to DOL. For any instance where an agency is unsure if a contract is or is not exempt, they can call the Bureau of Public Work at the number noted below for a determination. Payment by check or journal voucher is due to DOL within thirty days from the date of the billing. DOL will verify the amounts and forward them to OSC for processing.

For those contracts which are not approved or administered by the Comptroller, monthly reports and payments for deposit into the Public Work Enforcement Fund must be provided to the Administrative Finance Bureau at the DOL within 30 days of the end of each month or on a payment schedule mutually agreed upon with DOL.

Reports should contain the following information:

- Name and billing address of State agency or public benefit corporation;
- State agency or public benefit corporation contact and phone number;
- Name and address of contractor receiving the award;
- Contract number and effective dates;
- Contract amount and PWEF assessment charge (if contract amount has been amended, reflect increase or decrease to original contract and the adjustment in the PWEF charge); and
- Brief description of the work to be performed under each contract.

Checks and Journal Vouchers, payable to the "New York State Department of Labor" should be sent to:

Department of Labor
Administrative Finance Bureau-PWEF Unit
Building 12, Room 464
State Office Campus
Albany, NY 12240

Any questions regarding billing should be directed to NYSDOL's Administrative Finance Bureau-PWEF Unit at (518) 457-3624 and any questions regarding Public Work Contracts should be directed to the Bureau of Public Work at (518) 457-5589.

Required Notice under Article 25-B of the Labor Law

**Attention All Employees, Contractors and Subcontractors:
You are Covered by the Construction Industry Fair Play Act**

The law says that you are an employee unless:

- You are free from direction and control in performing your job, **and**
- You perform work that is not part of the usual work done by the business that hired you, **and**
- You have an independently established business.

Your employer cannot consider you to be an independent contractor unless all three of these facts apply to your work.

It is against the law for an employer to misclassify employees as independent contractors or pay employees off the books.

Employee Rights: If you are an employee, you are entitled to state and federal worker protections. These include:

- Unemployment Insurance benefits, if you are unemployed through no fault of your own, able to work, and otherwise qualified,
- Workers' compensation benefits for on-the-job injuries,
- Payment for wages earned, minimum wage, and overtime (under certain conditions),
- Prevailing wages on public work projects,
- The provisions of the National Labor Relations Act, and
- A safe work environment.

It is a violation of this law for employers to retaliate against anyone who asserts their rights under the law. Retaliation subjects an employer to civil penalties, a private lawsuit or both.

Independent Contractors: If you are an independent contractor, **you must pay all taxes and Unemployment Insurance contributions required by New York State and Federal Law.**

Penalties for paying workers off the books or improperly treating employees as independent contractors:

- **Civil Penalty** First offense: Up to \$2,500 per employee
 Subsequent offense(s): Up to \$5,000 per employee
- **Criminal Penalty** First offense: Misdemeanor - up to 30 days in jail, up to a \$25,000 fine and debarment from performing public work for up to one year.
 Subsequent offense(s): Misdemeanor - up to 60 days in jail or up to a \$50,000 fine and debarment from performing public work for up to 5 years.

If you have questions about your employment status or believe that your employer may have violated your rights and you want to file a complaint, call the Department of Labor at (866) 435-1499 or send an email to dol.misclassified@labor.ny.gov. All complaints of fraud and violations are taken seriously. You can remain anonymous.

Employer Name:

IA 999 (09/16)

Attention Employees

THIS IS A: PUBLIC WORK PROJECT

If you are employed on this project as a **worker, laborer, or mechanic** you are entitled to receive the **prevailing wage and supplements rate** for the classification at which you are working.

Chapter 629 of the Labor Laws of 2007:

These wages are set by law and must be posted at the work site. They can also be found at:

<https://dol.ny.gov/public-work-and-prevailing-wage>

If you feel that you have not received proper wages or benefits, please call our nearest office.*

Albany	(518) 457-2744	Patchogue	(631) 687-4882
Binghamton	(607) 721-8005	Rochester	(585) 258-4505
Buffalo	(716) 847-7159	Syracuse	(315) 428-4056
Garden City	(516) 228-3915	Utica	(315) 793-2314
New York City	(212) 932-2419	White Plains	(914) 997-9507
Newburgh	(845) 568-5156		

* For New York City government agency construction projects, please contact the Office of the NYC Comptroller at (212) 669-4443, or www.comptroller.nyc.gov – click on Bureau of Labor Law.

Contractor Name: _____

Project Location: _____

Requirements for OSHA 10 Compliance

Article 8 §220-h requires that when the advertised specifications, for every contract for public work, is \$250,000.00 or more the contract must contain a provision requiring that every worker employed in the performance of a public work contract shall be certified as having completed an OSHA 10 safety training course. The clear intent of this provision is to require that all employees of public work contractors, required to be paid prevailing rates, receive such training "prior to the performing any work on the project."

The Bureau will enforce the statute as follows:

All contractors and sub contractors must attach a copy of proof of completion of the OSHA 10 course to the first certified payroll submitted to the contracting agency and on each succeeding payroll where any new or additional employee is first listed.

Proof of completion may include but is not limited to:

- Copies of bona fide course completion card (*Note: Completion cards do not have an expiration date.*)
- Training roster, attendance record or other documentation from the certified trainer pending the issuance of the card.
- Other valid proof

**A certification by the employer attesting that all employees have completed such a course is not sufficient proof that the course has been completed.

Any questions regarding this statute may be directed to the New York State Department of Labor, Bureau of Public Work at 518-457-5589.

WICKS

Public work projects are subject to the Wicks Law requiring separate specifications and bidding for the plumbing, heating and electrical work, when the total project's threshold is \$3 million in Bronx, Kings, New York, Queens and, Richmond counties; \$1.5 million in Nassau, Suffolk and Westchester counties; and \$500,000 in all other counties.

For projects below the monetary threshold, bidders must submit a sealed list naming each subcontractor for the plumbing, HVAC and electrical and the amount to be paid to each. The list may not be changed unless the public owner finds a legitimate construction need, including a change in specifications or costs or the use of a Project Labor Agreement (PLA), and must be open to public inspection.

Allows the state and local agencies and authorities to waive the Wicks Law and use a PLA if it will provide the best work at the lowest possible price. If a PLA is used, all contractors shall participate in apprentice training programs in the trades of work it employs that have been approved by the Department of Labor (DOL) for not less than three years. They shall also have at least one graduate in the last three years and use affirmative efforts to retain minority apprentices. PLA's would be exempt from Wicks, but deemed to be public work subject to prevailing wage enforcement.

The Commissioner of Labor shall have the power to enforce separate specification requirements on projects, and may issue stop-bid orders against public owners for non-compliance.

Other new monetary thresholds, and similar sealed bidding for non-Wicks projects, would apply to certain public authorities including municipal housing authorities, NYC Construction Fund, Yonkers Educational Construction Fund, NYC Municipal Water Finance Authority, Buffalo Municipal Water Finance Authority, Westchester County Health Care Association, Nassau County Health Care Corp., Clifton-Fine Health Care Corp., Erie County Medical Center Corp., NYC Solid Waste Management Facilities, and the Dormitory Authority.

Contractors must pay subcontractors within a 7 days period.

(07.19)

Introduction to the Prevailing Rate Schedule

Information About Prevailing Rate Schedule

This information is provided to assist you in the interpretation of particular requirements for each classification of worker contained in the attached Schedule of Prevailing Rates.

Classification

It is the duty of the Commissioner of Labor to make the proper classification of workers taking into account whether the work is heavy and highway, building, sewer and water, tunnel work, or residential, and to make a determination of wages and supplements to be paid or provided. It is the responsibility of the public work contractor to use the proper rate. If there is a question on the proper classification to be used, please call the district office located nearest the project. District office locations and phone numbers are listed below.

Prevailing Wage Schedules are issued separately for "General Construction Projects" and "Residential Construction Projects" on a county-by-county basis.

General Construction Rates apply to projects such as: Buildings, Heavy & Highway, and Tunnel and Water & Sewer rates.

Residential Construction Rates generally apply to construction, reconstruction, repair, alteration, or demolition of one family, two family, row housing, or rental type units intended for residential use.

Some rates listed in the Residential Construction Rate Schedule have a very limited applicability listed along with the rate. Rates for occupations or locations not shown on the residential schedule must be obtained from the General Construction Rate Schedule. Please contact the local Bureau of Public Work office before using Residential Rate Schedules, to ensure that the project meets the required criteria.

Payrolls and Payroll Records

Contractors and subcontractors are required to establish, maintain, and preserve for not less than six (6) years, contemporaneous, true, and accurate payroll records.

Every contractor and subcontractor shall submit to the Department of Jurisdiction (Contracting Agency), within thirty (30) days after issuance of its first payroll and every thirty (30) days thereafter, a transcript of the original payrolls, subscribed and affirmed as true under penalty of perjury.

Paid Holidays

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

Overtime

At a minimum, all work performed on a public work project in excess of eight hours in any one day or more than five days in any workweek is overtime. However, the specific overtime requirements for each trade or occupation on a public work project may differ. Specific overtime requirements for each trade or occupation are contained in the prevailing rate schedules.

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays.

The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Supplemental Benefits

Particular attention should be given to the supplemental benefit requirements. Although in most cases the payment or provision of supplements is straight time for all hours worked, some classifications require the payment or provision of supplements, or a portion of the supplements, to be paid or provided at a premium rate for premium hours worked. Supplements may also be required to be paid or provided on paid holidays, regardless of whether the day is worked. The Overtime Codes and Notes listed on the particular wage classification will indicate these conditions as required.

Effective Dates

When you review the schedule for a particular occupation, your attention should be directed to the dates above the column of rates. These are the dates for which a given set of rates is effective. The rate listed is valid until the next effective rate change or until the new annual determination which takes effect on July 1 of each year. All contractors and subcontractors are required to pay the current prevailing rates of wages and supplements. If you have any questions please contact the Bureau of Public Work or visit the New York State Department of Labor website (www.labor.ny.gov) for current wage rate information.

Apprentice Training Ratios

The following are the allowable ratios of registered Apprentices to Journey-workers.

For example, the ratio 1:1,1:3 indicates the allowable initial ratio is one Apprentice to one Journeyworker. The Journeyworker must be in place on the project before an Apprentice is allowed. Then three additional Journeyworkers are needed before a second Apprentice is allowed. The last ratio repeats indefinitely. Therefore, three more Journeyworkers must be present before a third Apprentice can be hired, and so on.

Please call Apprentice Training Central Office at (518) 457-6820 if you have any questions.

Title (Trade)	Ratio
Boilermaker (Construction)	1:1,1:4
Boilermaker (Shop)	1:1,1:3
Carpenter (Bldg.,H&H, Pile Driver/Dockbuilder)	1:1,1:4
Carpenter (Residential)	1:1,1:3
Electrical (Outside) Lineman	1:1,1:2
Electrician (Inside)	1:1,1:3
Elevator/Escalator Construction & Modernizer	1:1,1:2
Glazier	1:1,1:3
Insulation & Asbestos Worker	1:1,1:3
Iron Worker	1:1,1:4
Laborer	1:1,1:3
Mason	1:1,1:4
Millwright	1:1,1:4
Op Engineer	1:1,1:5
Painter	1:1,1:3
Plumber & Steamfitter	1:1,1:3
Roofer	1:1,1:2
Sheet Metal Worker	1:1,1:3
Sprinkler Fitter	1:1,1:2

If you have any questions concerning the attached schedule or would like additional information, please contact the nearest BUREAU of PUBLIC WORK District Office or write to:

New York State Department of Labor
Bureau of Public Work
State Office Campus, Bldg. 12
Albany, NY 12240

District Office Locations:	Telephone #	FAX #
Bureau of Public Work - Albany	518-457-2744	518-485-0240
Bureau of Public Work - Binghamton	607-721-8005	607-721-8004
Bureau of Public Work - Buffalo	716-847-7159	716-847-7650
Bureau of Public Work - Garden City	516-228-3915	516-794-3518
Bureau of Public Work - Newburgh	845-568-5287	845-568-5332
Bureau of Public Work - New York City	212-932-2419	212-775-3579
Bureau of Public Work - Patchogue	631-687-4882	631-687-4902
Bureau of Public Work - Rochester	585-258-4505	585-258-4708
Bureau of Public Work - Syracuse	315-428-4056	315-428-4671
Bureau of Public Work - Utica	315-793-2314	315-793-2514
Bureau of Public Work - White Plains	914-997-9507	914-997-9523
Bureau of Public Work - Central Office	518-457-5589	518-485-1870

Westchester County General Construction

Boilermaker **10/01/2022**

JOB DESCRIPTION Boilermaker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Per Hour: 07/01/2022

Boilermaker	\$ 63.38
Repairs & Renovations	63.38

SUPPLEMENTAL BENEFITS

Per Hour:

Boilermaker	32% of hourly
Repair \$ Renovations	Wage Paid + \$ 25.38

NOTE: "Hourly Wage Paid" shall include any and all premium(s) pay.

Repairs & Renovation Includes replacement of parts and repairs & renovation of existing unit.

OVERTIME PAY

See (D, O) on OVERTIME PAGE
 Repairs & Renovation see (B,E,Q)

HOLIDAY

Paid: See (8, 16, 23, 24) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 11, 12, 15, 16, 22, 23, 24, 25) on HOLIDAY PAGE

NOTE: *Employee must work in pay week to receive Holiday Pay.
 **Employee gets 4 times the hourly wage rate for working Labor Day.

REGISTERED APPRENTICES

Wage per hour:
 (1/2) Year Terms at the following percentage of Boilermaker's Wage

1st	2nd	3rd	4th	5th	6th	7th
65%	70%	75%	80%	85%	90%	95%

Supplemental Benefits Per Hour:

Apprentice(s)	32% of Hourly Wage Paid Plus Amount Below
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1st Term	\$ 19.41
2nd Term	20.26
3rd Term	21.11
4th Term	21.96
5th Term	22.82
6th Term	23.68
7th Term	24.52

NOTE: "Hourly Wage Paid" shall include any and all premium(s)

4-5

Carpenter **10/01/2022**

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2022

Piledriver	\$ 58.16 + 9.54*
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Dockbuilder \$ 58.16
 + 9.54*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker \$ 44.54

OVERTIME PAY

See (B, E2, O) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE.

Paid: for 1st & 2nd yr.

Apprentices See (5,6,11,13,25)

Overtime: See (5,6,11,13,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour

(1)year terms:

1st	2nd	3rd	4th
\$24.60	\$30.20	\$38.58	\$46.97
+ 5.05*	+ 5.05*	+ 5.05*	+ 5.05*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

All Terms: \$ 31.03

8-1556 Db

Carpenter

10/01/2022

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2022

Carpet/Resilient

Floor Coverer \$ 55.05
 + 8.25*

*This portion is not subject to overtime premiums

INCLUDES HANDLING & INSTALLATION OF ARTIFICIAL TURF AND SIMILAR TURF INDOORS/OUTDOORS.

SUPPLEMENTAL BENEFITS

Per hour:

\$ 39.40

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18, 19) on HOLIDAY PAGE.

Paid for 1st & 2nd yr.

Apprentices See (5,6,11,13,16,18,19,25)

Overtime: See (5,6,11,13,16,18,19,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wage per hour - (1) year terms:

1st	2nd	3rd	4th
\$ 24.80	\$ 27.80	\$ 32.05	\$ 39.93
+ 1.85*	+ 2.35*	+ 2.85*	+ 3.85*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

1st	2nd	3rd	4th
\$ 14.80	\$ 15.80	\$ 18.90	\$ 19.90

8-2287

Carpenter

10/01/2022

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per Hour: 07/01/2022

Marine Construction:

Marine Diver \$ 73.03
 + 9.54*

Marine Tender \$ 62.11
 + 9.54*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker \$ 44.54

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18, 19) on HOLIDAY PAGE

Overtime: See (5, 6, 10, 11, 13, 16, 18, 19) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One (1) year terms.

1st year	\$ 24.60 + 5.05*
2nd year	30.20 + 5.05*
3rd year	38.58 + 5.05*
4th year	56.97 + 5.05*

*This portion is not subject to overtime premiums

Supplemental Benefits

Per Hour:

All terms \$ 31.03

8-1456MC

Carpenter

10/01/2022

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2022

Building
 Millwright \$ 57.80
 + 12.62*

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour:

Millwright \$ 43.16

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (18,19) on HOLIDAY PAGE.

Overtime See (5,6,8,11,13,18,19,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour:

One (1) year terms:

1st.	2nd.	3rd.	4th.
\$31.24	\$36.69	\$42.14	\$53.04
+ 6.75*	+ 7.92*	+ 9.09*	+ 11.43*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

One (1) year terms:

1st.	2nd.	3rd.	4th.
\$29.01	\$31.54	\$34.72	\$39.14

8-740.1

Carpenter

10/01/2022

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per Hour:

07/01/2022

Timberman \$ 53.05
+ 10.01*

*This portion not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per Hour:

07/01/2022

\$ 43.75

OVERTIME PAY

See (B, E, E2, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE.

Paid: for 1st & 2nd yr.

Apprentices See (5,6,11,13,25)

Overtime: See (5,6,11,13,25) on HOLIDAY PAGE.

REGISTERED APPRENTICES

Wages per hour:

One (1) year terms:

1st	2nd	3rd	4th
\$22.42	\$27.53	\$35.18	\$42.84
+ 5.30*	+ 5.30*	+ 5.30*	+5.30*

*This portion is not subject to overtime premiums

Supplemental benefits per hour:

All terms \$ 30.74

8-1556 Tm

Carpenter **10/01/2022**

JOB DESCRIPTION Carpenter

DISTRICT 8

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Westchester

PARTIAL COUNTIES

Orange: South of but including the following, Waterloo Mills, Slate Hill, New Hampton, Goshen, Blooming Grove, Mountainville, east to the Hudson River.

Putnam: South of but including the following, Cold Spring, TompkinsCorner, Mahopac, Croton Falls, east to Connecticut border.

Suffolk: West of Port Jefferson and Patchogue Road to Route 112 to the Atlantic Ocean.

WAGES

Per hour: 07/01/2022 10/18/2022

Core Drilling:

Driller	\$ 42.27	\$ 43.38	
	+ 2.30*	+ 2.50*	

Driller Helper

	33.47	34.47	
	+ 2.30*	+ 2.50*	

Note: Hazardous Waste Pay Differential:

For Level C, an additional 15% above wage rate per hour

For Level B, an additional 15% above wage rate per hour

For Level A, an additional 15% above wage rate per hour

Note: When required to work on water: an additional \$ 3.00 per hour.

*This portion is not subject to overtime premiums

SUPPLEMENTAL BENEFITS

Per hour:

Driller and Helper	\$ 28.30	\$ 28.85	
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OVERTIME PAY

See (B, G, P) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

8-1536-CoreDriller

Carpenter - Building / Heavy&Highway **10/01/2022**

JOB DESCRIPTION Carpenter - Building / Heavy&Highway

DISTRICT 11

ENTIRE COUNTIES

Putnam, Rockland, Westchester

WAGES

WAGES:(per hour)

Applies to CAPRENTER BUILDING/HEAVY & HIGHWAY/TUNNEL:

	07/01/2022	07/01/2023	07/01/2024	07/01/2025
Base Wage	\$ 38.95	\$ 1.25**	\$ 1.25**	\$ 1.25**
	+\$6.65*			

*For all hours paid straight or premium.

**To be allocated at a later date.

SHIFT DIFFERENTIAL: When it is mandated by a Government Agency irregular or off shift can be worked. The Carpenter shall receive an additional fifteen percent (15%) of wage plus applicable benefits.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker	\$ 32.88	
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OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

BUILDING:

Paid: See (1) on HOLIDAY PAGE.
 Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE.
 - Holidays that fall on Sunday will be observed Monday.

HEAVY&HIGHWAY/TUNNEL:

Paid: See (5, 6, 25) on HOLIDAY PAGE
 Overtime: See (5, 6) on HOLIDAY PAGE
 - Holidays that fall on Sunday will be observed Monday
 - Must be employed during the five (5) work days immediately preceding a holiday or during the five (5) work days following the paid holiday to receive holiday pay
 - If Employee is entitled to a paid holiday, the Employee is paid the Holiday wage and supplemental benefits whether they work or not. If Employee works the Holiday, the Employee will receive holiday pay (including supplemental benefits), plus the applicable premium wage for working the Holiday. If Employee works in excess of 8 hours on Holiday, then benefits will be paid for any hours in excess of 8 hours.

REGISTERED APPRENTICES

1 year terms at the following wage rates:

1st	2nd	3rd	4th	5th
\$ 19.48	\$ 23.37	\$ 25.32	\$ 27.27	\$ 31.16
+3.57*	+3.57*	+3.57*	+3.57*	+3.57*

*For all hours paid straight or premium

SUPPLEMENTAL BENEFITS per hour:

All terms \$ 16.28

11-279.1B/HH

Electrician

10/01/2022

JOB DESCRIPTION Electrician

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Queens, Richmond, Westchester

WAGES

Per hour:	07/01/2022	03/09/2023
Service Technician	\$ 35.40	\$ 36.40

Service and Maintenance on Alarm and Security Systems.

Maintenance, repair and /or replacement of defective (or damaged) equipment on, but not limited to, Burglar - Fire - Security - CCTV - Card Access - Life Safety Systems and associated devices. (Whether by service contract of T&M by customer request.)

SUPPLEMENTAL BENEFITS

Per hour:		
Journeyworker:	\$ 20.18	\$ 21.07

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE
 Overtime: See (5, 6, 11, 15, 16, 17, 25, 26) on HOLIDAY PAGE

9-3H

Electrician

10/01/2022

JOB DESCRIPTION Electrician

DISTRICT 8

ENTIRE COUNTIES

Westchester

WAGES

Per hour:	07/01/2022
*Electrician/A-Technician	\$ 53.75
Teledata	53.75

*All new installations of wiring, conduit, junction boxes and light fixtures for projects with a base bid of more than \$325,000. For projects with a base bid of \$325,000 or less, see Maintenance and Repair rates.

Note: On a job where employees are required to work on bridges over navigable waters, transmission towers, light poles, bosun chairs, swinging scaffolds , etc. 40 feet or more above the water or ground or under compressed air, or tunnel projects under construction or where assisted breathing apparatus is required, they will be paid at the rate of time and one-half for such work except on normal pole line or building construction work.

SUPPLEMENTAL BENEFITS

Per hour:
 Journeyworker \$ 54.39

OVERTIME PAY

See (A, G, *J, P) on OVERTIME PAGE

*NOTE: Emergency work on Sunday and Holidays is at the time and one-half overtime rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year terms at the following wage rates:

	07/01/2022
1st term	\$ 15.00
2nd term	16.00
3rd term	18.00
4th term	20.00
MIJ 1-12 months	25.00
MIJ 13-18 months	28.50

Supplemental Benefits per hour:

	07/01/2022
1st term	\$ 10.82
2nd term	13.05
3rd term	14.39
4th term	15.72
MIJ 1-12 months	13.49
MIJ 13-18 months	13.87

8-3/W

Electrician **10/01/2022**

JOB DESCRIPTION Electrician

DISTRICT 8

ENTIRE COUNTIES

Westchester

WAGES

Per hour	07/01/2022
Electrician -M	\$ 28.50
H - Telephone	28.50

All work with a base bid amount of \$325,000 or less. Including repairs and /or replacement of defective electrical and teledata equipment, all work necessary to retrofit, service, maintain and repair all kinds of lighting fixtures and local lighting controls, and washing and cleaning of foregoing fixtures.

*If the project exceeds \$375,000 due to changes in the scope of work, an Electrician/A Technician must be part of the labor ratio.

SUPPLEMENTAL BENEFITS

	07/01/2022
Electrician & H - Telephone	\$ 13.87

OVERTIME PAY

See (B, G, *J, P) on OVERTIME PAGE

*Note: Emergency work on Sunday and Holidays is at the time and one-half overtime rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

8-3m

Elevator Constructor

10/01/2022

JOB DESCRIPTION Elevator Constructor

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk

PARTIAL COUNTIES

Rockland: Entire County except for the Township of Stony Point

Westchester: Entire County except for the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

WAGES

Per hour:

07/01/2022 03/17/2023

Elevator Constructor \$ 75.14 \$ 77.49

Modernization & Service/Repair 59.09 60.89

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

NOTE- In order to use the '4 Day/10 Hour Work Schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 IS NOT SUBMITTED you will be liable for overtime payments for work over the allotted hours per day listed.

SUPPLEMENTAL BENEFITS

Per Hour:

Elevator Constructor \$ 43.914 \$ 45.574

Modernization & Service/Repairs 42.787 44.412

OVERTIME PAY

Constructor See (D, M, T) on OVERTIME PAGE.

Modern/Service See (B, F, S) on OVERTIME PAGE.

HOLIDAY

Paid: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

WAGES PER HOUR:

*Note:1st, 2nd, 3rd Terms are based on Average wage of Constructor & Modernization.

Terms 4 thru 9 Based on Journeyman's wage of classification Working in.

6 MONTH TERMS:

1st Term* 50%	2nd & 3rd Term* 50%	4th & 5th Term 55%	6th & 7th Term 65%	8th & 9th Term 75%
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SUPPLEMENTAL BENEFITS

Elevator Constructor

1st Term \$ 0.00 \$ 0.00

2nd & 3rd Term 34.772 36.024

4th & 5th Term 35.606 36.943

6th & 7th Term 37.052 38.448

8th & 9th Term 38.497 39.953

Modernization & Service/Repair

1st Term \$ 0.00 \$ 0.00

2nd & 3rd Term 34.672 35.694

4th & 5th Term 35.195 36.525

6th & 7th Term 36.571 37.948

8th & 9th Term 37.938 39.38

JOB DESCRIPTION Elevator Constructor

DISTRICT 1

ENTIRE COUNTIES

Columbia, Dutchess, Greene, Orange, Putnam, Sullivan, Ulster

PARTIAL COUNTIES

Delaware: Towns of Andes, Bovina, Colchester, Davenport, Delhi, Harpersfield, Hemdon, Kortright, Meredith, Middletown, Roxbury, Hancock & Stamford

Rockland: Only the Township of Stony Point.

Westchester: Only the Townships of Bedford, Lewisboro, Cortland, Mt. Kisco, North Salem, Pound Ridge, Somers and Yorktown.

WAGES

Per Hour	07/01/2022	01/01/2023
Mechanic	\$ 64.63	\$ 67.35
Helper	70% of Mechanic Wage Rate	70% of Mechanic Wage Rate

Four (4), ten (10) hour days may be worked for New Construction and Modernization Work at straight time during a week, Monday thru Thursday or Tuesday thru Friday.

***Four (4), ten (10) hour days are not permitted for Contract Work/Repair Work

NOTE - In order to use the '4 Day/10 Hour Work Schedule' as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule', form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour	07/01/2022	01/01/2023
Journeyman/Helper	\$ 36.885*	\$ 37.335*

(*)Plus 6% of regular hourly if less than 5 years of service. Plus 8% of regular hourly rate if more than 5 years of service.

OVERTIME PAY

See (D, O) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 15, 16) on HOLIDAY PAGE
 Overtime: See (5, 6, 15, 16) on HOLIDAY PAGE

Note: When a paid holiday falls on Saturday, it shall be observed on Friday. When a paid holiday falls on Sunday, it shall be observed on Monday.

REGISTERED APPRENTICES

Wages per hour:				
0-6 mo*	6-12 mo	2nd yr	3rd yr	4th yr
50 %	55 %	65 %	70 %	80 %

(*)Plus 6% of the hourly rate, no additional supplemental benefits.

Supplemental Benefits per hour worked:

Same as Journeyman/Helper

1-138

Glazier

10/01/2022

JOB DESCRIPTION Glazier

DISTRICT 8

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Per hour:	7/01/2022	11/01/2022
Glazier	\$ 59.59	Additional \$ 1.25
*Scaffolding	61.55	
Glass Tinting & Window Film	30.11	
**Repair & Maintenance	30.11	

*Scaffolding includes swing scaffold, mechanical equipment, scissor jacks, man lifts, booms & buckets 24' or more, but not pipe scaffolding.

**Repair & Maintenance- All repair & maintenance work on a particular building whenever performed, where the total cumulative contract value is under \$148,837. All Glass tinting, window film, regardless of material or intended use, and all affixing of decals to windows or glass.

SUPPLEMENTAL BENEFITS

Per hour: 7/01/2022

Journeyworker	\$ 37.55
Glass tinting & Window Film	22.01
Repair & Maintenance	22.01

OVERTIME PAY

See (B,H,V) on OVERTIME PAGE.

For 'Repair & Maintenance' and 'Glass Tinting & Window Film' see (B, B2, I, S) on overtime page.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (4, 6, 16, 25) on HOLIDAY PAGE

For 'Repair & Maintenance' and 'Glass Tinting & Window Film' Only

Paid: See(5, 6, 16, 25)

Overtime: See(5, 6, 16, 25)

REGISTERED APPRENTICES

Wage per hour:

(1) year terms at the following wage rates:

	7/01/2022	11/01/2022
1st term	\$ 21.15	TBD
2nd term	29.07	
3rd term	35.20	
4th term	47.38	

Supplemental Benefits:

(Per hour)

1st term	\$ 17.15
2nd term	24.42
3rd term	27.06
4th term	32.15

8-1087 (DC9 NYC)

Insulator - Heat & Frost

10/01/2022

JOB DESCRIPTION Insulator - Heat & Frost

DISTRICT 8

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Westchester

WAGES

Per hour:	07/01/2022	05/31/2023
Insulator	\$ 58.25	+ \$ 2.00
Discomfort & Additional Training**	61.30	+ \$ 2.00
Fire Stop Work*	31.15	+ \$ 2.00

* Applies on all exclusive Fire Stop Work (When contract is for Fire Stop work only). No apprentices on these contracts only.

**Applies to work requiring; garb or equipment worn against the body not customarily worn by insulators;psychological evaluation;special training, including but not limited to "Yellow Badge" radiation training

Note: Additional \$0.50 per hour for work 30 feet or more above floor or ground level.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker	\$ 36.10
Discomfort &	

Additional Training 38.09
 Fire Stop Work:
 Journeyworker 18.41

OVERTIME PAY

See (B, E, E2, Q, *T) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Note: Last working day preceding Christmas and New Years day, workers shall work no later than 12:00 noon and shall receive 8 hrs pay.

Overtime: See (2*, 4, 6, 16, 25) on HOLIDAY PAGE.

*Note: Labor Day triple time if worked.

REGISTERED APPRENTICES

(1) year terms:

Insulator Apprentices:

1st	2nd	3rd	4th
\$ 31.15	\$ 36.56	\$ 41.98	\$ 47.41

Discomfort & Additional Training Apprentices:

1st	2nd	3rd	4th
\$ 32.67	\$ 38.39	\$ 44.12	\$ 49.85

Supplemental Benefits paid per hour:

Insulator Apprentices:

1st term	\$ 18.41
2nd term	21.94
3rd term	25.48
4th term	29.03

Discomfort & Additional Training Apprentices:

1st term	\$ 19.41
2nd term	23.14
3rd term	26.88
4th term	30.62

8-91

Ironworker

10/01/2022

JOB DESCRIPTION Ironworker

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per Hour: 07/01/2022 01/01/2023

Stone Derrickmen Rigger \$ 72.26 Additional + \$ 1.64

Stone Handset
 Derrickman 70.11 + \$ 1.11

SUPPLEMENTAL BENEFITS

Per hour:

Stone Derrickmen Rigger \$ 42.10

Stone Handset
 Derrickman 42.09

OVERTIME PAY

See (B, D1, *E, Q, **V) on OVERTIME PAGE

*Time and one-half shall be paid for all work on Saturday up to eight (8) hours and double time shall be paid for all work thereafter.

** Benefits same premium as wages on Holidays only

HOLIDAY

Paid: See (18) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 25) on HOLIDAY PAGE

Work stops at schedule lunch break with full day's pay.

REGISTERED APPRENTICES

Wage per hour:

Stone Derrickmen Rigger:

	1st	2nd	3rd	4th
07/01/2022	\$ 35.58	\$ 50.89	\$ 56.71	\$ 62.48

Supplemental benefits:

Per hour:

07/01/2022	21.61	31.97	31.97	31.97
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Stone Handset:

1/2 year terms at the following hourly wage rate:

	1st	2nd	3rd	4th
07/01/2022	34.50	49.43	54.99	61.00

Supplemental benefits:

Per hour:

07/01/2022	21.60	31.96	31.96	31.96
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9-197D/R

Ironworker

10/01/2022

JOB DESCRIPTION Ironworker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per Hour:	07/01/2022	01/01/2023
Ornamental	\$ 46.65	Additional
Chain Link Fence	46.65	\$ 1.25
Guide Rail	46.65	

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:	\$ 62.04
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OVERTIME PAY

See (B, B1, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Apprentices Hired after 9/1/18:

1 year terms

1st Term	\$ 20.63
2nd Term	24.22
3rd Term	27.80
4th Term	31.38

Supplemental Benefits per hour:

1st Term	\$ 17.90
2nd Term	19.15
3rd Term	20.41
4th Term	21.67

4-580-Or

Ironworker

10/01/2022

JOB DESCRIPTION Ironworker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

PER HOUR:

	07/01/2022	01/01/2023
Ironworker:		Additional
Structural	\$ 55.70	\$ 1.75

Bridges
 Machinery

SUPPLEMENTAL BENEFITS

PER HOUR PAID:

Journeyman \$ 85.35

OVERTIME PAY

See (B, B1, Q, *V) on OVERTIME PAGE

*NOTE: Benefits are calculated for every hour paid

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 18, 19) on HOLIDAY PAGE

REGISTERED APPRENTICES

WAGES PER HOUR:

6 month terms at the following rate:

1st \$ 28.97
 2nd 29.57
 3rd - 6th 30.18

Supplemental Benefits

PER HOUR PAID:

All Terms \$ 59.18

4-40/361-Str

Ironworker

10/01/2022

JOB DESCRIPTION Ironworker

DISTRICT 4

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

PARTIAL COUNTIES

Rockland: Southern section - south of Convent Road and east of Blue Hills Road.

WAGES

Per hour: 07/01/2022 07/01/2023

Reinforcing & Metal Lathing \$ 56.90 Additional \$ 1.50

"Base" Wage \$ 55.20 plus \$ 1.70

"Base" Wage is used to calculate overtime hours only.

SUPPLEMENTAL BENEFITS

Per hour:

Reinforcing & Metal Lathing \$ 41.18

OVERTIME PAY

See (B, E, Q, *X) on OVERTIME PAGE

*Only \$23.50 per Hour for non worked hours

Supplemental Benefit Premiums for Overtime Hours worked:

Time & One Half \$ 47.68
 Double Time \$ 54.18

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 11, 13, *18, **19, 25) on HOLIDAY PAGE

*Note: Work performed after first 4 Hours.

REGISTERED APPRENTICES

(1) year terms at the following wage rates:

1st term 2nd term 3rd term 4th Term

Wage Per Hour:

\$ 22.55	\$ 23.60	\$ 24.60	\$ 37.18
"Base" Wage			
\$ 21.00	\$ 22.00	\$ 23.00	\$ 35.60
plus \$1.55	plus \$1.60	plus \$1.60	plus \$1.58

"Base" Wage is used to calculate overtime hours ONLY.

SUPPLEMENTAL BENEFITS
 Per Hour:

1st term	2nd term	3rd term	4th Term
\$ 18.17	\$ 17.17	\$ 16.22	\$ 22.50

4-46Reinf

Laborer - Building **10/01/2022**

JOB DESCRIPTION Laborer - Building **DISTRICT 8**

ENTIRE COUNTIES
 Putnam, Westchester

WAGES

Per hour 07/01/2022

Laborer \$ 39.05
plus \$5.45**

Laborer - Asbestos & Hazardous
 Materials Removal \$ 43.50*

* Abatement/Removal of:

- Lead based or lead containing paint on materials to be repainted is classified as Painter.
- Asbestos containing roofs and roofing material is classified as Roofer.

** This portion is not subject to overtime premium.

NOTE: Upgrade/Material condition work plan for work performed during non-outage under a wage formula of 90% wage/100% fringe benefits at nuclear power plants.

SUPPLEMENTAL BENEFITS

Per hour: 07/01/2022

Journeyworker \$ 29.50

OVERTIME PAY

See (B, E, E2, Q, *V) on OVERTIME PAGE

*Note: For Sundays and Holidays worked benefits are at the same premium as wages.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

LABORER ONLY

Hourly terms at the following wage:

Level A	Level B	Level C	Level D
0-1000	1001-2000	2001-3000	3001-4000
\$ 27.07	\$ 30.89	\$ 34.72	\$ 38.54

Supplemental Benefits per hour:

Apprentices
 All terms \$ 22.20

8-235/B

Laborer - Heavy&Highway **10/01/2022**

JOB DESCRIPTION Laborer - Heavy&Highway **DISTRICT 8**

ENTIRE COUNTIES
 Putnam, Westchester

WAGES

PUTNAM: APPLIES TO ALL HEAVY & HIGHWAY WORK EXCLUDING HIGHWAYS, STREETS, AND BRIDGES

GROUP I: Blaster, Quarry Master, Curbs/Asphalt Screedman, Pipe Jacking and Boring Operations Operator, Qualified Dead Condition Pipe Fuser (B Mechanic)

GROUP II: Burner, Drillers(jumbo, joy, wagon, air track, hydraulic), Drill Operator, Self Contained Rotary Drill, Curbs, Raker, Bar Person, Concrete Finisher.

GROUP III: Pavement Breakers, Jeeper Operator, Jack Hammer, Pneumatic Tools (all), Gas Driller, Guniting, Railroad Spike Puller, Pipelayer, Chain Saw, Deck winches on scows, Power Buggy Operator, Power Wheelbarrow Operator, Bar Person Helper, Compressed Air lance, Water Jet Lance.

GROUP IV: Concrete Laborers, Asph. Worker, Rock Scaler, Vibrator Oper., Bit Grinder, Air Tamper, Pumps, Epoxy (adhesives, fillers and troweled on), Barco Rammer, Concrete Grinder, Crack Router Operator, Guide Rail-digging holes and placing concrete and demolition when not to be replaced, distribution of materials and tightening of bolts.

GROUP V: Drillers Helpers, Common Laborer, Mason Tenders, Signal Person, Pit Person, Truck Spotter, Powder Person, Landscape/Nursery Person, Dump Person, Temp. Heat.

GROUP VIA: Asbestos/Toxic Waste Laborer-All removal (Roads, Tunnels, Landfills, etc.) Confined space laborer, Bio-remediation, Phyto-remediation, Lead or Hazardous material, Abatement Laborer.

Wages:(per hour)	07/01/2022
GROUP I	\$ 47.13*
GROUP II	45.78*
GROUP III	45.38*
GROUP IV	45.03*
GROUP V	44.68*
GROUP VIA	46.68*
Operator Qualified	
Gas Mechanic(A Mech)	57.13*
Flagperson	38.33*

*NOTE: To calculate overtime premiums, deduct \$0.10 from above wages

SHIFT WORK: A shift premium will be paid on Public Work contracts for off-shift or irregular shift work when mandated by the NYS D.O.T. or other Governmental Agency contracts. Employees shall receive an additional 15% per hour above current rate for all regular and irregular shift work. Premium pay shall be calculated using the 15% per hour differential as base rate.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:

First 40 Hours	
Per Hour	\$ 26.82
Over 40 Hours	
Per Hour	20.32

OVERTIME PAY

See (B, E, P, R, S) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

NOTE: For Holiday Overtime: 5, 6 - Code 'S' applies
 For Holiday Overtime: 8, 15, 25, 26 - Code 'R' applies

REGISTERED APPRENTICES

	1st term	2nd term	3rd term	4th term
	1-1000hrs	1001-2000hrs	2001-3000hrs	3001-4000hrs
07/01/2022	\$ 25.37	\$ 29.94	\$ 34.51	\$ 38.98

Supplemental Benefits per hour:

1st term	\$ 4.70 - After 40 hours: \$ 4.45
2nd term	\$ 4.80 - After 40 hours: 4.45
3rd term	\$ 5.30 - After 40 hours: 4.85
4th term	\$ 5.85 - After 40 hours: 5.35

Laborer - Tunnel

10/01/2022

JOB DESCRIPTION Laborer - Tunnel

DISTRICT 11

ENTIRE COUNTIES

Columbia, Dutchess, Greene, Orange, Otsego, Putnam, Rockland, Sullivan, Ulster, Westchester

PARTIAL COUNTIES

Chenango: Townships of Columbus, Sherburne and New Berlin.

Delaware: Townships of Andes, Bovina, Middletown, Roxbury, Franklin, Hamden, Stamford, Delhi, Kortright, Harpersfield, Merideth and Davenport.

WAGES

Class 1: All support laborers/sandhogs working above the shaft or tunnel.

Class 2: All laborers/sandhogs working in the shaft or tunnel.

Class 4: Safety Miners

Class 5: Site work related to Shaft/Tunnel

WAGES: (per hour)

	07/01/2022
Class 1	\$ 53.45
Class 2	55.60
Class 4	62.00
Class 5	44.80

Toxic and hazardous waste, lead abatement and asbestos abatement work will be paid an additional \$ 3.00 an hour.

SHIFT DIFFERENTIAL...On all Government mandated irregular shift work:

- Employee shall be paid at time and one half the regular rate Monday through Friday.
- Saturday shall be paid at 1.65 times the regular rate.
- Sunday shall be paid at 2.15 times the regular rate.

SUPPLEMENTAL BENEFITS

Per hour:

Benefit 1	\$ 34.45
Benefit 2	51.60
Benefit 3	68.75

Benefit 1 applies to straight time hours, paid holidays not worked.

Benefit 2 applies to over 8 hours in a day (M-F), irregular shift work hours worked, and Saturday hours worked.

Benefit 3 applies to Sunday and Holiday hours worked.

OVERTIME PAY

See (B, E, Q, X) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 15, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 15, 16, 25) on HOLIDAY PAGE

When a recognized Holidays falls on Saturday or Sunday, holidays falling on Saturday shall be recognized or observed on Friday and holidays falling on Sunday shall be recognized or observed on Monday. Employees ordered to work on the Saturday or Sunday of the holiday or on the recognized or the observed Friday or Monday for those holidays falling on Saturday or Sunday shall receive double time the established rate and benefits for the holiday.

REGISTERED APPRENTICES

FOR APPRENTICE RATES, refer to the appropriate Laborer Heavy & Highway wage rate contained in the wage schedule for the County and location where the work is to be performed.

11-17/60/235/754Tun

Lineman Electrician

10/01/2022

JOB DESCRIPTION Lineman Electrician

DISTRICT 6

ENTIRE COUNTIES

Westchester

WAGES

A Lineman/Technician shall perform all overhead aerial work. A Lineman/Technician on the ground will install all electrical panels, connect all grounds, install and connect all electrical conductors, assembly of all electrical materials, conduit, pipe or raceway; placing of fish wire; pulling of cables, wires or fiber optic cable through such raceways; splicing of conductors; dismantling of such structures, lines or equipment.

A Groundman/Truck Driver shall: Build and set concrete forms, handle steel mesh, set footer cages, transport concrete in a wheelbarrow, hand or machine concrete vibrator, finish concrete footers, mix mortar, grout pole bases, cover and maintain footers while curing in cold weather, operate jack hammer, operate hand pavement breaker, tamper, concrete and other motorized saws, as a drill helper, operate and maintain generators, water pumps, chainsaws, sand blasting, operate mulching and seeding machine, air tools, electric tools, gas tools, load and unload materials, hand shovel and/or broom, prepare and pour mastic and other fillers, assist digger operator equipment/operator in ground excavation and restoration, landscape work and painting. Only when assisting a lineman technician, a groundman/truck driver may assist in installing conduit, pipe, cables and equipment.

Below rates apply to electrical overhead and underground distribution and maintenance work and overhead and underground transmission line work, electrical substations, switching structures, continuous pipe-type underground fluid or gas filled transmission conduit and cable installations, maintenance jobs or projects, railroad catenary installations and maintenance, third rail installations, the bonding of rails and the installation of fiber optic cable. (Ref #14.04.01)

NOTE: Includes Teledata Work within ten (10) feet of High Voltage Transmission Lines. Also includes digging of holes for poles, anchors, footer, and foundations for electrical equipment.

Per hour:	07/01/2022	05/01/2023	05/06/2024
Lineman, Tech, Welder	\$ 59.01	\$ 60.41	\$ 61.91
Crane, Crawler Backhoe	59.01	60.41	61.91
Cable Splicer-Pipe Type	64.91	66.45	68.10
Digging Mach Operator	53.11	54.37	55.72
Cert. Welder-Pipe Type	61.96	63.43	65.01
Tractor Trailer Driver	50.16	51.35	52.62
Groundman, Truck Driver	47.21	48.33	49.53
Equipment Mechanic	47.21	48.33	49.53
Flagman	35.41	36.25	37.15

Additional \$1.00 per hour for entire crew when a helicopter is used.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT	8:00 AM TO 4:30 PM REGULAR RATE
2ND SHIFT	4:30 PM TO 1:00 AM REGULAR RATE PLUS 17.3%
3RD SHIFT	12:30 AM TO 9:00 AM REGULAR RATE PLUS 31.4%

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

	07/01/2022	05/01/2023	05/06/2024
Journeyman	\$ 25.90 *plus 7% of the hourly wage paid	\$ 26.40 *plus 7% of the hourly wage paid	\$ 26.90 *plus 7% of the hourly wage paid
Journeyman Lineman or Equipment Operators with Crane License	\$ 27.90 *plus 7% of the hourly wage paid	\$ 29.40 *plus 7% of the hourly wage paid	\$ 30.90 *plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

OVERTIME PAY

See (B, E, Q,) on OVERTIME PAGE. *Note* Double time for emergency work designated by the Dept of Jurisdiction.

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.
 Overtime See (5, 6, 8, 13, 25) on HOLIDAY PAGE plus Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES

WAGES per hour: 1000 hour terms at the following percentage of the applicable Journeyman Lineman wage.

1st	2nd	3rd	4th	5th	6th	7th
60%	65%	70%	75%	80%	85%	90%

SUPPLEMENTAL BENEFITS per hour:

07/01/2022	05/01/2023	05/06/2024
\$ 25.90	\$ 26.40	\$ 26.90
*plus 7% of the hourly wage paid	*plus 7% of the hourly wage paid	*plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249aWest

Lineman Electrician - Teledata

10/01/2022

JOB DESCRIPTION Lineman Electrician - Teledata

DISTRICT 6

ENTIRE COUNTIES

Albany, Allegany, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Lewis, Livingston, Madison, Monroe, Montgomery, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per hour:

For outside work, stopping at first point of attachment (demarcation).

	07/01/2022	01/01/2023	01/01/2024	01/01/2025
Cable Splicer	\$ 36.28	\$ 37.73	\$ 39.24	\$ 40.81
Installer, Repairman	\$ 34.43	\$ 35.81	\$ 37.24	\$ 38.73
Teledata Lineman	\$ 34.43	\$ 35.81	\$ 37.24	\$ 38.73
Tech., Equip. Operator	\$ 34.43	\$ 35.81	\$ 37.24	\$ 38.73
Groundman	\$ 18.25	\$ 18.98	\$ 19.74	\$ 20.53

NOTE: EXCLUDES Teledata work within ten (10) feet of High Voltage (600 volts and over) transmission lines. For this work please see LINEMAN.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED:

1ST SHIFT	REGULAR RATE
2ND SHIFT	REGULAR RATE PLUS 10%
3RD SHIFT	REGULAR RATE PLUS 15%

SUPPLEMENTAL BENEFITS

Per hour:	07/01/2022	01/01/2023	01/01/2024	01/01/2025
Journeyman	\$ 5.14	\$ 5.14	\$ 5.14	\$ 5.14
	*plus 3% of the hourly wage paid			

*The 3% is based on the hourly wage paid, straight time rate or premium rate.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked. Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16) on HOLIDAY PAGE

6-1249LT - Teledata

Lineman Electrician - Traffic Signal, Lighting **10/01/2022**

JOB DESCRIPTION Lineman Electrician - Traffic Signal, Lighting

DISTRICT 6

ENTIRE COUNTIES
 Westchester

WAGES

Lineman/Technician shall perform all overhead aerial work. A Lineman/Technician on the ground will install all electrical panels, connect all grounds, install and connect all electrical conductors which includes, but is not limited to road loop wires; conduit and plastic or other type pipes that carry conductors, flex cables and connectors, and to oversee the encasement or burial of such conduits or pipes.

A Groundman/Groundman Truck Driver shall: Build and set concrete forms, handle steel mesh, set footer cages, transport concrete in a wheelbarrow, hand or machine concrete vibrator, finish concrete footers, mix mortar, grout pole bases, cover and maintain footers while curing in cold weather, operate jack hammer, operate hand pavement breaker, tamper, concrete and other motorized saws, as a drill helper, operate and maintain generators, water pumps, chainsaws, sand blasting, operate mulching and seeding machine, air tools, electric tools, gas tools, load and unload materials, hand shovel and/or broom, prepare and pour mastic and other fillers, assist digger operator/equipment operator in ground excavation and restoration, landscape work and painting. Only when assisting a lineman technician, a groundman/truck driver may assist in installing conduit, pipe, cables and equipment.

A flagger's duties shall consist of traffic control only.
 (Ref #14.01.03)

Per hour:	07/01/2022	05/01/2023	05/06/2024
Lineman, Technician	\$ 53.60	\$ 54.73	\$ 55.95
Crane, Crawler Backhoe	53.60	54.73	55.95
Certified Welder	56.28	57.47	58.75
Digging Machine	48.24	49.26	50.36
Tractor Trailer Driver	45.56	46.52	47.56
Groundman, Truck Driver	42.88	43.78	44.76
Equipment Mechanic	42.88	43.78	44.76
Flagman	32.16	32.84	33.57

Above rates are applicable for installation, testing, operation, maintenance and repair on all Traffic Control (Signal) and Illumination (Lighting) projects, Traffic Monitoring Systems, and Road Weather Information Systems. Includes digging of holes for poles, anchors, footer foundations for electrical equipment; assembly of all electrical materials or raceway; placing of fish wire; pulling of cables, wires or fiber optic cable through such raceways; splicing of conductors; dismantling of such structures, lines or equipment.

NOTE: THE FOLLOWING RATES WILL APPLY ON ALL CONTRACTING AGENCY MANDATED MULTIPLE SHIFTS OF AT LEAST FIVE (5) DAYS DURATION WORKED BETWEEN THE HOURS LISTED BELOW:

1ST SHIFT	8:00 AM TO 4:30 PM REGULAR RATE
2ND SHIFT	4:30 PM TO 1:00 AM REGULAR RATE PLUS 17.3%
3RD SHIFT	12:30 AM TO 9:00 AM REGULAR RATE PLUS 31.4%

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day. Tuesday thru Friday may be worked with no make-up day.

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour worked (but also required on non-worked holidays):

	07/01/2022	05/01/2023	05/06/2024
Journeyman	\$ 25.90 *plus 7% of the hourly wage paid	\$ 26.40 *plus 7% of the hourly wage paid	\$ 26.90 *plus 7% of the hourly wage paid
Journeyman Lineman or Equipment Operators with Crane License	\$ 27.90 *plus 7% of the hourly wage paid	\$ 29.40 *plus 7% of the hourly wage paid	\$ 30.90 *plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE. *Note* Double time for emergency work designated by the Dept. of Jurisdiction.
 NOTE: WAGE CAP - Double the straight time hourly base wage shall be the maximum hourly wage compensation for any hour worked.
 Contractor is still responsible to pay the hourly benefit amount for each hour worked.

HOLIDAY

Paid: See (5, 6, 8, 13, 25) on HOLIDAY PAGE and Governor of NYS Election Day.
 Overtime: See (5, 6, 8, 13, 25) on HOLIDAY PAGE and Governor of NYS Election Day.

NOTE: All paid holidays falling on Saturday shall be observed on the preceding Friday. All paid holidays falling on Sunday shall be observed on the following Monday. Supplements for holidays paid at straight time.

REGISTERED APPRENTICES

WAGES per hour: 1000 hour terms at the following percentage of the applicable Journeyman Lineman wage.

1st	2nd	3rd	4th	5th	6th	7th
60%	65%	70%	75%	80%	85%	90%

SUPPLEMENTAL BENEFITS per hour:

07/01/2022	05/01/2023	05/06/2024
\$ 25.90	\$ 26.40	\$ 26.90
*plus 7% of the hourly wage paid	*plus 7% of the hourly wage paid	*plus 7% of the hourly wage paid

*The 7% is based on the hourly wage paid, straight time or premium time.

6-1249aWestLT

Mason - Building

10/01/2022

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Nassau, Rockland, Suffolk, Westchester

WAGES

Per hour:	07/01/2022	12/05/2022	06/05/2023
		Additional	Additional
Tile Setters	\$ 62.01	\$ 0.73	\$ 0.73

SUPPLEMENTAL BENEFITS

Per Hour:	\$ 26.13*
	+ \$10.02

* This portion of benefits subject to same premium rate as shown for overtime wages.

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE
 Work beyond 10 hours on Saturday shall be paid at double the hourly wage rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage per hour:

(750 hour) term at the following wage rate:

Term:	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
	1-750	751-1500	1501-2250	2251-3000	3001-3750	3751-4500	4501-5250	5251-6000	6001-6750	6501-7000
	\$21.23	\$26.11	\$33.26	\$38.14	\$41.67	\$45.04	\$48.60	\$53.47	\$56.25	\$60.33

Supplemental Benefits per hour:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$12.55*	\$12.55*	\$15.16*	\$15.16*	\$16.75*	\$18.30*	\$19.35*	\$19.40*	\$17.45*	\$22.80*

+\$.69 +\$.74 +\$.84 +\$.88 +\$1.28 +\$1.33 +\$1.70 +\$1.75 +\$5.90 +\$6.42

* This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/52A

Mason - Building **10/01/2022**

JOB DESCRIPTION Mason - Building

DISTRICT 11

ENTIRE COUNTIES

Putnam, Rockland, Westchester

PARTIAL COUNTIES

Orange: Only the Township of Tuxedo.

WAGES

Per hour:

07/01/2022 06/01/2023

Bricklayer	\$ 44.79	\$ 45.89
Cement Mason	44.79	45.89
Plasterer/Stone Mason	44.79	45.89
Pointer/Caulker	44.79	45.89

Additional \$1.00 per hour for power saw work
 Additional \$0.50 per hour for swing scaffold or staging work

SHIFT WORK: When shift work or an irregular work day is mandated or required by state, federal, county, local or other governmental agency contracts, the following premiums apply:

- Irregular work day requires 15% premium
- Second shift an additional 15% of wage plus benefits to be paid
- Third shift an additional 25% of wage plus benefits to be paid

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman	\$ 37.00	\$ 37.95
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OVERTIME PAY

OVERTIME:

Cement Mason See (B, E, Q, W) on OVERTIME PAGE.
 All Others See (B, E, Q) on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5wp-b

Mason - Building **10/01/2022**

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Building
 07/01/2022

Wages per hour:

Mosaic & Terrazzo Mechanic	\$ 59.21
Mosaic & Terrazzo Finisher	57.60

SUPPLEMENTAL BENEFITS

Per hour:

Mosaic & Terrazzo Mechanic	\$ 26.21* + \$11.73
Mosaic & Terrazzo Finisher	\$ 26.21* + \$11.72

*This portion of benefits subject to same premium rate as shown for overtime wages.

OVERTIME PAY

See (A, E, Q) on OVERTIME PAGE
 07/01/2022- Deduct \$7.00 from hourly wages before calculating overtime.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

Easter Sunday is an observed holiday. Holidays falling on a Saturday will be observed on that Saturday. Holidays falling on a Sunday will be celebrated on the Monday.

REGISTERED APPRENTICES

Wages Per hour:

	1st	2nd	3rd	4th	5th	6th
	0- 1500	1501- 3000	3001- 3750	3751- 4500	4501- 5250	5251- 6000
	\$ 22.82	\$ 29.34	\$ 31.32	\$ 36.55	\$ 41.77	\$ 46.99

Supplemental Benefits per hour:

	\$4.62*	\$5.94*	\$15.73*	\$18.35*	\$20.97*	\$23.59*
	+\$6.56	+\$8.43	+\$11.24	+\$13.11	+\$14.99	+\$16.85

*This portion of benefits subject to same premium rate as shown for overtime wages.

9-7/3

Mason - Building

10/01/2022

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2022

Building-Marble Restoration:
 Marble, Stone & \$ 46.60

Terrazzo Polisher, etc

SUPPLEMENTAL BENEFITS

Per Hour:
 Journeyworker:

Building-Marble Restoration:
 Marble, Stone &
 Polisher \$ 29.77

OVERTIME PAY

See (B, *E, Q, V) on OVERTIME PAGE

*ON SATURDAYS, 8TH HOUR AND SUCCESSIVE HOURS PAID AT DOUBLE HOURLY RATE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE
 1ST TERM APPRENTICE GETS PAID FOR ALL OBSERVED HOLIDAYS.

REGISTERED APPRENTICES

WAGES per hour:

900 hour term at the following wage:

1st 1- 900	2nd 901- 1800	3rd 1801- 2700	4th 2701
\$ 32.61	\$ 37.28	\$ 41.94	\$ 46.60

Supplemental Benefits Per Hour:

27.07	27.97	28.87	29.77
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9-7/24-MP

Mason - Building

10/01/2022

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Dutchess, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Sullivan, Ulster, Westchester

WAGES

Wages: 07/01/2022

Marble Cutters & Setters \$ 62.17

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker \$ 38.27

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage Per Hour:

750 hour terms at the following wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
1- 750	751- 1500	1501- 2250	2251- 3000	3001- 3750	3751- 4500	4501- 5250	5251- 6000	6001- 6751	6751- 7500
\$ 24.88	\$ 27.97	\$ 31.08	\$ 34.17	\$ 37.29	\$ 40.39	\$ 43.51	\$ 46.61	\$ 52.82	\$ 59.05

Supplemental Benefits per hour:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 20.55	\$ 22.04	\$ 23.52	\$ 25.01	\$ 26.47	\$ 27.96	\$ 29.42	\$ 30.91	\$ 33.86	\$ 36.81 9-7/4

Mason - Building

10/01/2022

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Nassau, Rockland, Suffolk, Westchester

WAGES

Per hour: 07/01/2022 12/05/2022 06/05/2023
 Additional Additional

Tile Finisher \$ 47.60 \$ 0.59 \$ 0.58

SUPPLEMENTAL BENEFITS

Per Hour:

\$ 22.16*
 + \$9.85

*This portion of benefits subject to same premium rate as shown for overtime wages

OVERTIME PAY

See (B, E, Q, *V) on OVERTIME PAGE

*Work beyond 10 hours on a Saturday shall be paid at double the hourly wage rate.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 11, 15, 16, 25) on HOLIDAY PAGE

9-7/88A-tf

Mason - Building

10/01/2022

JOB DESCRIPTION Mason - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2022

Marble, Stone, etc.
 Maintenance Finishers: \$ 27.01

Note 1: An additional \$2.00 per hour for time spent grinding floor using "60 grit" and below.
 Note 2: Flaming equipment operator shall be paid an additional \$25.00 per day.

SUPPLEMENTAL BENEFITS

Per Hour:

Marble, Stone, etc.
 Maintenance Finishers: \$ 14.40

OVERTIME PAY

See (B, *E, Q, V) on OVERTIME PAGE

*Double hourly rate after 8 hours on Saturday

HOLIDAY

Paid: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 11, 15, 25) on HOLIDAY PAGE

1st term apprentice gets paid for all observed holidays.

REGISTERED APPRENTICES

WAGES per hour:

07/01/2022

0-750	\$ 21.67
751-1500	22.38
1501-2250	23.10
2251-3000	23.80
3001-3750	24.87
3751-4500	26.29
4501+	27.01

Supplemental Benefits:

Per hour:

0-750	11.52
751-1500	11.90
1501-2250	12.29
2251-3000	12.67
3001-3750	13.25
3751-4500	14.01
4501+	14.40

Mason - Building / Heavy&Highway

10/01/2022

JOB DESCRIPTION Mason - Building / Heavy&Highway

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, Nassau, New York, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2022

Marble-Finisher \$ 48.97

SUPPLEMENTAL BENEFITS

Journeyworker:
per hour

Marble- Finisher \$ 35.76

OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

Work beyond 8 hours on a Saturday shall be paid at double the rate.

HOLIDAY

Overtime: See (5, 6, 8, 11, 15, 16, 25) on HOLIDAY PAGE

When an observed holiday falls on a Sunday, it will be observed the next day.

9-7/20-MF

Mason - Heavy&Highway

10/01/2022

JOB DESCRIPTION Mason - Heavy&Highway

DISTRICT 11

ENTIRE COUNTIES

Putnam, Rockland, Westchester

PARTIAL COUNTIES

Orange: Only the Township of Tuxedo.

WAGES

Per hour: 07/01/2022 06/01/2023

Bricklayer	\$ 45.29	\$ 46.39
Cement Mason	45.29	46.39
Marble/Stone Mason	45.29	46.39
Plasterer	45.29	46.39
Pointer/Caulker	45.29	46.39

Additional \$1.00 per hour for power saw work
 Additional \$0.50 per hour for swing scaffold or staging work

SHIFT WORK: When shift work or an irregular work day is mandated or required by state, federal, county, local or other governmental contracts, the following rates apply:

- Irregular work day requires 15% premium
- Second shift an additional 15% of wage plus benefits to be paid
- Third shift an additional 25% of wage plus benefits to be paid

SUPPLEMENTAL BENEFITS

Per hour:

Journeyman \$ 37.00 \$ 37.95

OVERTIME PAY

Cement Mason See (B, E, Q, W)

All Others See (B, E, Q,)

HOLIDAY

Paid: See (5, 6, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

- Whenever any of the above holidays fall on Sunday, they will be observed on Monday. Whenever any of the above holidays fall on Saturday, they will be observed on Friday.

- Supplemental Benefits are not paid for paid Holiday

- If Holiday is worked, Supplemental Benefits are paid for hours worked.

- Whenever an Employee works within three (3) calendar days before a holiday, the Employee shall be paid for the Holiday.

REGISTERED APPRENTICES

Wages per hour:

750 hour terms at the following percentage of Journeyman's wage

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Supplemental Benefits per hour

750 hour terms at the following percentage of journeyman supplements

1st	2nd	3rd	4th	5th	6th	7th	8th
50%	55%	60%	65%	70%	75%	80%	85%

Apprentices indentured before June 1st, 2011 receive full journeyman benefits

11-5WP-H/H

Operating Engineer - Building

10/01/2022

JOB DESCRIPTION Operating Engineer - Building

DISTRICT 9

ENTIRE COUNTIES

Bronx, Kings, New York, Putnam, Queens, Richmond, Westchester

PARTIAL COUNTIES

Dutchess: that part of Dutchess County lying south of the North City Line of the City of Poughkeepsie.

WAGES

NOTE: Construction surveying

Party Chief--One who directs a survey party

Instrument Man--One who runs the instrument and assists Party Chief.

Rodman--One who holds the rod and assists the Survey Crew

Wages:(Per Hour) 07/01/2022

Building Construction:

Party Chief	\$ 76.64
Instrument Man	60.50
Rodman	40.64

Steel Erection:

Party Chief	79.41
Instrument Man	62.85
Rodman	43.48

Heavy Construction-NYC counties only:
 (Foundation, Excavation.)

Party Chief	84.60
Instrument man	63.79
Rodman	54.52

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2022

Building Construction	\$ 26.69* +\$ 7.40
Steel Erection	27.29* +\$ 7.40
Heavy Construction	25.25* +\$ 7.15

* This portion subject to same premium as wages

Non-Worked Holiday Supplemental Benefit:
 16.45

OVERTIME PAY

See (A, B, E, Q) on OVERTIME PAGE

Code "A" applies to Building Construction and has double the rate after 7 hours on Saturdays.

Code "B" applies to Heavy Construction and Steel Erection and had double the rate after 8 hours on Saturdays.

HOLIDAY

Paid: See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 9, 11, 15, 16, 25) on HOLIDAY PAGE

9-15Db

Operating Engineer - Building

10/01/2022

JOB DESCRIPTION Operating Engineer - Building

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I:

Cranes (All Types up to 49 tons), Boom Trucks, Cherry Pickers (All Types), Clamshell Crane, Derrick (Stone and Steel), Dragline, Franki Pile Rig or similar, High Lift (Lull or similar) with crane attachment and winch used for hoisting or lifting, Hydraulic Cranes, Pile Drivers, Potain and similar.

Cranes (All types 50-99 tons), Drill Rig Casa Grande (CAT or similar), Franki Pile Rig or similar, Hydraulic Cranes (All types including Crawler Cranes- No specific boom length).

Cranes (All types 100 tons and over), All Tower Cranes, All Climbing Cranes irrespective of manufacturer and regardless of how the same is rigged, Franki Pile Rig or similar, Conventional Cranes (All types including Crawler Cranes-No specific boom length), Hydraulic Cranes.

GROUP I-A: Barber Green Loader-Euclid Loader, Bulldozer, Carrier-Trailer Horse, Concrete Cleaning Decontamination Machine Operator, Concrete-Portable Hoist, Conway or Similar Mucking Machines, Elevator & Cage, Excavators all types, Front End Loaders, Gradall, Shovel, Backhoe, etc.(Crawler or Truck), Heavy Equipment Robotics Operator/Mechanic, Hoist Engineer-Material, Hoist Portable Mobile Unit, Hoist(Single, Double or Triple Drum), Horizontal Directional Drill Locator, Horizontal Directional Drill Operator and Jersey Spreader, Letourneau or Tournapull(Scrapers over 20 yards Struck), Lift Slab Console, etc., Lull HiLift or Similar, Master Environmental Maintenance Mechanics, Mucking Machines Operator/Mechanic or Similar Type, Overhead Crane, Pavement Breaker(Air Ram), Paver(Concrete), Post Hole Digger, Power House Plant, Road Boring Machine, Road Mix Machine, Ross Carrier and Similar Machines, Rubber tire double end backhoes and similar machines, Scoopmobile Tractor-Shovel Over 1.5 yards, Shovel (Tunnels), Spreader (Asphalt) Telephie(Cableway), Tractor Type Demolition Equipment, Trenching Machines-Vermeer Concrete Saw Trencher and Similar, Ultra High Pressure Waterjet Cutting Tool System, Vacuum Blasting Machine operator/mechanic, Winch Truck A Frame.

GROUP I-B: Compressor (Steel Erection), Mechanic (Outside All Types), Negative Air Machine (Asbestos Removal), Push Button (Buzz Box) Elevator.

GROUP II: Compactor Self-Propelled, Concrete Pump, Crane Operator in Training (Over 100 Tons), Grader, Machines Pulling Sheep's Foot Roller, Roller (4 ton and over), Scrapers (20 yards Struck and Under), Vibratory Rollers, Welder.

GROUP III-A: Asphalt Plant, Concrete Mixing Plants, Forklift (All power sources), Joy Drill or similar, Tractor Drilling Machine, Loader (1 1/2 yards and under), Portable Asphalt Plant, Portable Batch Plant, Portable Crusher, Skid Steer (Bobcat or similar), Stone Crusher, Well Drilling Machine, Well Point System.

GROUP III-B: Compressor Over 125 cu. Feet, Conveyor Belt Machine regardless of size, Compressor Plant, Ladder Hoist, Stud Machine.

GROUP IV-A: Batch Plant, Concrete Breaker, Concrete Spreader, Curb Cutter Machine, Finishing Machine-Concrete, Fine Grading Machine, Hepa Vac Clean Air Machine, Material Hopper(sand, stone, cement), Mulching Grass Spreader, Pump Gypsum etc, Pump-Plaster-Grout-Fireproofing. Roller(Under 4 Ton),Spreading and Fine Grading Machine, Steel Cutting Machine, Siphon Pump, Tar Joint Machine, Television Cameras for Water, Sewer, Gas etc. Turbo Jet Burner or Similar Equipment, Vibrator (1 to 5).

GROUP IV-B: Compressor (all types), Heater (All Types), Fire Watchman, Lighting Unit (Portable & Generator) Pump, Pump Station(Water, Sewer, Portable, Temporary), Welding Machine (Steel Erection & Excavation).

GROUP V: Mechanics Helper, Motorized Roller (walk behind), Stock Attendant, Welder's Helper, Maintenance Engineer Crane(75 ton and over).

Group VI-A: Welder Certified

GROUP VI-B: Utility Man, Warehouse Man.

WAGES: (per hour)

	07/01/2022	03/06/2023	03/04/2024
GROUP I			
Cranes- up to 49 tons	\$ 65.03	\$ 66.23	\$ 67.43
Cranes- 50 tons to 99 tons	67.28	68.53	69.77
Cranes- 100 tons and over	76.77	78.21	79.64
GROUP I-A	56.97	58.01	59.04
GROUP I-B	52.52	53.48	54.41
GROUP II	54.98	55.98	56.97
GROUP III-A	52.97	53.94	54.88
GROUP III-B	50.44	51.35	52.25
GROUP IV-A	52.44	53.40	54.33
GROUP IV-B	44.38	45.17	45.94
GROUP V	47.83	48.69	49.53
Group VI-A	55.93	56.96	57.96
GROUP VI-B			
Utility Man	45.39	46.21	47.00
Warehouse Man	47.57	48.52	49.26

An additional 20% to wage when required to wear protective equipment on hazardous/toxic waste projects.
 Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour.
 Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour.
 Loader operators over 5 cubic yard capacity additional .50 per hour.
 Shovel operators over 4 cubic yard capacity additional \$1.00 per hour.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker	\$ 29.87	\$ 30.57	\$ 31.32
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OVERTIME PAY

See (B, E, Q, V) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

8-137B

Operating Engineer - Heavy&Highway

10/01/2022

JOB DESCRIPTION Operating Engineer - Heavy&Highway

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I: Boom Truck, Cherry Picker, Clamshell, Crane, (Crawler, Truck), Dragline, Drill Rig (Casa Grande, Cat, or Similar), Floating Crane (Crane on Barges) under 100 tons, Gin Pole, Hoist Engineer-Concrete (Crane-Derrick-Mine Hoist), Knuckle Boom Crane, Rough Terrain Crane.

GROUP I-A: Auger (Truck or Truck Mounted), Boat Captain, Bulldozer-All Sizes, Central Mix Plant Operator, Chipper (all types), Close Circuit T.V., Combination Loader/Backhoe, Compactor with Blade, Concrete Finishing Machine, Gradall, Grader (Motor Grader), Elevator & Cage (Materials or Passenger), Excavator (and all attachments), Front End Loaders (1 1/2 yards and over), High Lift Lull and similar, Hoist (Single, Double, Triple Drum), Hoist Portable Mobile Unit, Hoist Engineer (Material), Jack and Bore Machine, Log Skidders, Mill Machines, Mucking Machines, Overhead Crane, Paver (concrete), Post Pounder (of any type), Push Cats, Road Reclaimer, Robot Hammer (Brokk or similar), Robotic Equipment (Scope of Engineer Schedule), Ross Carrier and similar, Scrapers (20 yard struck and over), Side Boom, Slip Form Machine, Spreader (Asphalt), Trenching Machines (Telephies-Vermeer Concrete Saw), Tractor Type Demolition Equipment, Vacuum Truck. Vibratory Roller(Riding) or Roller used in mainline paving operations.

GROUP I-B: Asphalt Mobile Conveyor/Transfer Machine, Road Paver (Asphalt).

GROUP II-A: Ballast Regulators, Compactor Self Propelled, Fusion Machine, Rail Anchor Machines, Roller (4 ton and over), Scrapers (20 yard struck and under).

GROUP II-B: Mechanic (Outside) All Types, Shop Mechanic.

GROUP III: Air Tractor Drill, Asphalt Plant, Batch Plant, Boiler (High Pressure), Concrete Breaker (Track or Rubber Tire), Concrete Pump, Concrete Spreader, Excavator Drill, Farm Tractor, Forklift (all types), Gas Tapping (Live), Hydroseeder, Loader (1 1/2 yards and under), Locomotive (all sizes), Machine Pulling Sheeps Foot Roller, Portable Asphalt Plant, Portable Batch Plant, Portable Crusher (Apprentice), Powerhouse Plant, Roller (under 4 ton), Sheer Excavator, Skid Steer/Bobcat, Stone Crusher, Sweeper (with seat), Well Drilling Machine.

GROUP IV: Service Person (Grease Truck), Deckhand.

GROUP IV-B: Conveyor Belt Machine (Truck Mounted), Heater (all types), Lighting Unit (Portable), Maintenance Engineer (For Crane Only), Mechanics Helper, Pump (Fireproofing), Pumps-Pump Station/Water/Sewer/Gypsum/Plaster, etc., Pump Truck (Sewer Jet or Similar), Welders Helper, Welding Machine (Steel Erection), Well Point System.

GROUP V: All Tower Cranes-All Climbing Cranes and all cranes of 100-ton capacity or greater (3900 Manitowac or similar) irrespective of manufacturer and regardless of how the same is rigged, Hoist Engineer (Steel), Engineer-Pile Driver, Jersey Spreader, Pavement Breaker/Post Hole Digger.

WAGES: Per hour:	07/01/2022	03/06/2023	03/04/2024
Group I	\$ 65.97	\$ 67.27	\$ 68.63
Group I-A	58.16	59.26	60.42
Group I-B	61.28	62.46	63.70
Group II-A	55.70	56.74	57.84
Group II-B	57.44	58.52	59.67
Group III	54.72	55.74	56.81
Group IV	49.74	50.63	51.57
Group IV-B	42.71	43.43	44.19
Group V			
Engineer All Tower, Climbing and Cranes of 100 Tons	74.73	76.24	77.82
Hoist Engineer(Steel)	67.67	69.01	70.41
Engineer(Pile Driver)	72.16	73.61	75.13
Jersey Spreader, Pavement Breaker (Air Ram)Post Hole Digger	56.99	58.06	59.19

SHIFT DIFFERENTIAL:

A 15% premium on all hours paid, including overtime hours for 2nd, 3rd shifts on all government mandated off-shift work

Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour over the rate listed in the Wage Schedule. Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour over the rate listed in the Wage Schedule. Loader and Excavator Operators: over 5 cubic yards capacity \$0.50 per hour over the rate listed in the Wage Schedule. Shovel Operators: over 4 cubic yards capacity \$1.00 per hour over the rate listed in the Wage Schedule.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday; Friday may be used as a make-up day.

NOTE - In order to use the 4 Day/10 Hour Work schedule Registration for Use of 4 Day/10 Hour Work Schedule, form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker:	\$ 32.60 up to 40 Hours	\$ 33.75 up to 40 hours	\$ 34.85 up to 40 hours
	After 40 hours \$ 23.40* PLUS \$ 1.20 on all hours worked	After 40 hours \$ 24.50* PLUS \$ 1.25 on all hours worked	After 40 hours \$ 25.55* PLUS \$ 1.25 on all hours worked

*This amount is subject to premium

OVERTIME PAY

See (B, E, P, *R, **U) on OVERTIME PAGE

HOLIDAY

Paid:..... See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

Overtime..... See (5, 6, 8, 15, 25, 26) on OVERTIME PAGE

* For Holiday codes 8,15,25,26 code R applies

** For Holiday Codes 5 & 6 code U applies

Note: If employees are required to work on Easter Sunday they shall be paid at the rate of triple time.

REGISTERED APPRENTICES

(1)year terms at the following rate.

1st term	\$ 29.08	\$ 29.63	\$ 30.21
2nd term	34.90	35.56	36.25
3rd term	40.71	41.48	42.30
4th term	46.53	47.41	48.34
Supplemental Benefits per hour:			
	24.55	25.70	26.85

8-137HH

Operating Engineer - Heavy&Highway

10/01/2022

JOB DESCRIPTION Operating Engineer - Heavy&Highway

DISTRICT 9

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: South of the North city line of Poughkeepsie

WAGES

Party Chief - One who directs a survey party

Instrument Man - One who runs the instrument and assists Party Chief

Rodman - One who holds the rod and in general, assists the Survey Crew

Categories cover GPS & Underground Surveying

Per Hour: 07/01/2022

Party Chief	\$ 81.72
Instrument Man	61.43
Rodman	52.40

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2022

All Categories
 Straight Time: \$ 25.25* plus \$7.15

Premium:
 Time & 1/2 \$ 37.88* plus \$7.15

Double Time \$ 50.50* plus \$7.15

Non-Worked Holiday Supplemental Benefits:
 \$ 16.45

OVERTIME PAY

See (B, *E, Q) on OVERTIME PAGE

* Doubletime paid on all hours in excess of 8 hours on Saturday

HOLIDAY

Paid: See (5, 6, 7, 11, 12) on HOLIDAY PAGE

Overtime: See (5, 6, 7, 11, 12) on HOLIDAY PAGE

9-15Dh

Operating Engineer - Heavy&Highway - Tunnel

10/01/2022

JOB DESCRIPTION Operating Engineer - Heavy&Highway - Tunnel

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

PARTIAL COUNTIES

Dutchess: All the counties of Westchester and Putnam and the southern part of Dutchess County defined by the northern boundary line of the City of Poughkeepsie, then due east to Route 115, then north along Route 115 to Bedell Road, then east along Bedell Road to Van Wagner Road, then north along Van Wagner Road to Bower Road, then east along Bower Road to Route 44 and along Route 44 east to Route 343, then along Route 343 east to the northern boundary of Town of Dover Plains and east along the northern boundary of Town of Dover Plains to the border line of the State of Connecticut and bordered on the west by the middle of the Hudson River.

WAGES

GROUP I: Boom Truck, Cherry Picker, Clamshell, Crane(Crawler, Truck), Dragline, Drill Rig Casa Grande(Cat or Similar), Floating Crane(Crane on Barge-Under 100 Tons), Hoist Engineer(Concrete/Crane-Derrick-Mine Hoist), Knuckle Boom Crane, Rough Terrain Crane.

GROUP I-A: Auger(Truck or Truck Mounted), Boat Captain, Bull Dozer-all sizes, Central Mix Plant Operator, Chipper-all types, Close Circuit T.V., Combination Loader/Backhoe, Compactor with Blade, Concrete Finishing Machine, Gradall, Grader(Motor Grader), Elevator & Cage(Materials or Passengers), Excavator(and all attachments), Front End Loaders(1 1/2 yards and over), High Lift Lull, Hoist(Single, Double, Triple Drum), Hoist Portable Mobile Unit, Hoist Engineer(Material), Jack and Bore Machine, Log Skidder, Milling Machine, Moveable Concrete Barrier Transfer & Transport Vehicle, Mucking Machines. Overhead Crane, Paver(Concrete), Post Pounder of any type, Push Cats, Road Reclaimer, Robot Hammer(Brokk or similar), Robotic Equipment(Scope of Engineer Schedule), Ross Carrier and similar machines, Scrapers(20 yards struck and over), Side Boom, Slip Form Machine, Spreader(Asphalt), Trenching Machines, Telephies-Vermeer Concrete Saw, Tractor type demolition equipment, Vacuum Truck, Vibratory Roller (Riding) used in mainline paving operations.

GROUP I-B: Asphalt Mobile Conveyor/Transfer Machine, Road Paver(Asphalt).

GROUP II-A: Ballast Regulators, Compactor(Self-propelled), Fusion Machine, Rail Anchor Machines, Roller(4 ton and over), Scrapers(20 yard struck and under).

GROUP II-B: Mechanic(outside)all types, Shop Mechanic.

GROUP III: Air Tractor Drill, Asphalt Plant, Batch Plant, Boiler(High Pressure), Concrete Breaker(Track or Rubber Tire), Concrete Pump, Concrete Spreader, Excavator Drill, Farm Tractor, Forklift(all types of power), Gas Tapping(Live), Hydroseeder, Loader(1 1/2 yards and under), Locomotive(all sizes), Machine Pulling Sheeps Foot Roller, Portable Asphalt Plant, Portable Batch Plant, Portable Crusher(Apprentice), Powerhouse Plant, Roller(under 4 ton), Sheer Excavator, Skidsteer/Bobcat, Stone Crusher, Sweeper(with seat), Well Drilling Machine.

GROUP IV-A: Service Person(Grease Truck), Deckhand.

GROUP IV-B: Conveyor Belt Machine(Truck Mounted), Heater(all types), Lighting Unit(Portable), Maintenance Engineer(for Crane only), Mechanics Helper, Pump(Fireproofing), Pumps-Pump Station/Water/Sewer/Gypsum/Plaster, etc., Pump Truck(Sewer Jet or similar), Welding Machine(Steel Erection), Welders Helper.

GROUP V-A: Engineer(all Tower Cranes, all Climbing Cranes & all Cranes of 100 ton capacity or greater),Hoist Engineer(Steel-Sub Structure), Engineer-Pile Driver, Jersey-Spreader, Pavement breaker, Post Hole Digger

WAGES: (per hour)

	07/01/2022	03/06/2023	03/04/2024
GROUP I	\$ 65.97	\$ 67.27	\$ 68.63
GROUP I-A	58.16	59.26	60.42
GROUP I-B	61.28	62.46	63.70
GROUP II-A	55.70	56.74	57.84
GROUP II-B	57.44	58.52	59.67
GROUP III	54.72	55.74	56.81
GROUP IV-A	49.74	50.63	51.57
GROUP IV-B	42.71	43.43	44.19
GROUP V-A			
Engineer-Cranes	74.73	76.24	77.82
Engineer-Pile Driver	72.16	73.61	75.13
Hoist Engineer	67.67	69.01	70.41
Jersey Spreader/Post Hole Digger	56.99	58.06	59.19

SHIFT DIFFERENTIAL:

A 15% premium on all hours paid, including overtime hours for 2nd, 3rd shifts on all government mandated off-shift work

An additional 20% to wage when required to wear protective equipment on hazardous/toxic waste projects. Operators required to use two buckets pouring concrete on other than road pavement shall receive \$0.50 per hour over scale. Engineers operating cranes with booms 100 feet but less than 149 feet in length will be paid an additional \$2.00 per hour. Engineers operating cranes with booms 149 feet or over in length will be paid an additional \$3.00 per hour. Operators of shovels with a capacity over (4) cubic yards shall be paid an additional \$1.00 per hour. Operators of loaders with a capacity over (5) cubic yards shall be paid an additional \$0.50 per hour.

SUPPLEMENTAL BENEFITS

Per hour:
 Journeyworker:

\$ 32.60 up to 40 hours After 40 hours \$23.40 plus \$1.20 on all hours worked	\$ 33.75 up to 40 hours After 40 hours \$24.50 plus \$1.25 on all hours worked	\$ 34.85 up to 40 hours After 40 hours \$25.55 plus \$1.25 on all hours worked
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OVERTIME PAY

See (D, O, *U, V) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 15, 25, 26) on HOLIDAY PAGE

* Note: For Holiday codes 5 & 6, code U applies. For Holiday codes 8, 15, 25, 26, code R applies.
 Note: If employees are required to work on Easter Sunday, they shall be paid at the rate of triple time.

REGISTERED APPRENTICES

(1)year terms at the following rates:

1st term	\$ 29.08	\$ 29.63	\$ 30.21
2nd term	34.90	35.56	36.25
3rd term	40.71	41.48	42.30
4th term	46.53	47.41	48.34

Supplemental Benefits per hour:

All terms	\$ 24.55	\$ 25.70	\$ 26.85
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8-137Tun

Operating Engineer - Marine Dredging

10/01/2022

JOB DESCRIPTION Operating Engineer - Marine Dredging

DISTRICT 4

ENTIRE COUNTIES

Albany, Bronx, Cayuga, Clinton, Columbia, Dutchess, Essex, Franklin, Greene, Jefferson, Kings, Monroe, Nassau, New York, Orange, Oswego, Putnam, Queens, Rensselaer, Richmond, Rockland, St. Lawrence, Suffolk, Ulster, Washington, Wayne, Westchester

WAGES

These wages do not apply to Operating Engineers on land based construction projects. For those projects, please see the Operating Engineer Heavy/Highway Rates. The wage rates below for all equipment and operators are only for marine dredging work in navigable waters found in the counties listed above.

Per Hour:	07/01/2022	10/01/2022
CLASS A1 Deck Captain, Leverman Mechanical Dredge Operator Licensed Tug Operator 1000HP or more.	\$ 42.66	\$ 43.94
CLASS A2 Crane Operator (360 swing)	38.02	39.16
CLASS B Dozer, Front Loader Operator on Land	To conform to Operating Engineer Prevailing Wage in locality where work is being performed including benefits.	
CLASS B1 Derrick Operator (180 swing) Spider/Spill Barge Operator Operator II, Fill Placer, Engineer, Chief Mate, Electrician, Chief Welder, Maintenance Engineer Licensed Boat, Crew Boat Operator	36.89	38.00
CLASS B2 Certified Welder	34.73	35.77

CLASS C1 Drag Barge Operator, Steward, Mate, Assistant Fill Placer	33.78	34.79
CLASS C2 Boat Operator	32.69	33.67
CLASS D Shoreman, Deckhand, Oiler, Rodman, Scowman, Cook, Messman, Porter/Janitor	27.16	27.97

SUPPLEMENTAL BENEFITS

Per Hour:
 THE FOLLOWING SUPPLEMENTAL BENEFITS APPLY TO ALL CATEGORIES

All Classes A & B	\$ 11.40 plus 6% of straight time wage, Overtime hours add \$ 0.63	\$ 11.85 plus 6% of straight time wage, Overtime hours add \$ 0.63
All Class C	\$ 11.10 plus 6% of straight time wage, Overtime hours add \$ 0.48	\$ 11.60 plus 6% of straight time wage, Overtime hours add \$ 0.50
All Class D	\$ 10.80 plus 6% of straight time wage, Overtime hours add \$ 0.33	\$ 11.35 plus 6% of straight time wage, Overtime hours add \$ 0.38

OVERTIME PAY
 See (B2, F, R) on OVERTIME PAGE

HOLIDAY
 Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 15, 26) on HOLIDAY PAGE

4-25a-MarDredge

Operating Engineer - Survey Crew - Consulting Engineer **10/01/2022**

JOB DESCRIPTION Operating Engineer - Survey Crew - Consulting Engineer **DISTRICT 9**

ENTIRE COUNTIES
 Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Suffolk, Westchester

PARTIAL COUNTIES
 Dutchess: That part in Dutchess County lying South of the North City line of Poughkeepsie.

WAGES
 Feasibility and preliminary design surveying, any line and grade surveying for inspection or supervision of construction.

Per hour: 07/01/2022
 Survey Classifications

Party Chief	\$ 46.44
Instrument Man	38.60
Rodman	33.64

SUPPLEMENTAL BENEFITS

Per Hour:
 All Crew Members: \$ 21.60

OVERTIME PAY
 OVERTIME:.... See (B, E*, Q, V) ON OVERTIME PAGE.
 *Doubletime paid on the 9th hour on Saturday.

HOLIDAY
 Paid: See (5, 6, 7, 11, 16) on HOLIDAY PAGE

Overtime: See (5, 6, 7, 11, 16) on HOLIDAY PAGE

9-15dconsult

Painter **10/01/2022**

JOB DESCRIPTION Painter **DISTRICT 8**

ENTIRE COUNTIES
Bronx, Kings, Nassau, New York, Putnam, Queens, Richmond, Suffolk, Westchester

WAGES

Per hour: 07/01/2022

Brush \$ 51.45*

Abatement/Removal of lead based
or lead containing paint on
materials to be repainted. 51.45*

Spray & Scaffold \$ 54.45*

Fire Escape 54.45*

Decorator 54.45*

Paperhanger/Wall Coverer 53.83*

*Subtract \$ 0.10 to calculate premium rate.

SUPPLEMENTAL BENEFITS

Per hour:

Paperhanger \$ 33.15

All others 30.88

Premium 37.72**

**Applies only to "All others" category, not paperhanger journeyworker.

OVERTIME PAY

See (A, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

One (1) year terms at the following wage rate.

Per hour: 07/01/2022

Appr 1st term... \$ 19.95*

Appr 2nd term... 25.56*

Appr 3rd term... 31.00*

Appr 4th term... 41.52*

*Subtract \$ 0.10 to calculate premium rate.

Supplemental benefits:

Per Hour:

Appr 1st term... \$ 15.22

Appr 2nd term... 18.90

Appr 3rd term... 21.81

Appr 4th term... 27.58

8-NYDC9-B/S

Painter **10/01/2022**

JOB DESCRIPTION Painter **DISTRICT 8**

ENTIRE COUNTIES
Putnam, Suffolk, Westchester

PARTIAL COUNTIES

Nassau: All of Nassau except the areas described below: Atlantic Beach, Ceaderhurst, East Rockaway, Gibson, Hewlett, Hewlett Bay, Hewlett Neck, Hewlett Park, Inwood, Lawrence, Lido Beach, Long Beach, parts of Lynbrook, parts of Oceanside, parts of Valley Stream, and Woodmere. Starting on the South side of Sunrise Hwy in Valley Stream running east to Windsor and Rockaway Ave., Rockville Centre is the boundary line up to Lawson Blvd. turn right going west all the above territory. Starting at Union Turnpike and Lakeville Rd. going north to Northern Blvd. the west side of Lakeville road to Northern blvd. At Northern blvd. going east the district north of Northern blvd. to Port Washington Blvd. West of Port Washington blvd. to St. Francis Hospital then north of first traffic light to Port Washington and Sands Point, Manor HAven, Harbour Acres.

WAGES

Per hour: 07/01/2022
 Drywall Taper \$ 51.45*

*Subtract \$ 0.10 to calculate premium rate.

SUPPLEMENTAL BENEFITS

Per hour:
 Journeyman \$ 30.88

OVERTIME PAY

See (A, H) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages - Per Hour:

1500 hour terms at the following wage rate:

1st term \$ 19.95*
 2nd term 25.56*
 3rd term 31.00*
 4th term 41.52*

*Subtract \$ 0.10 to calculate premium rate.

Supplemental Benefits - Per hour:

One year term (1500 hours) at the following dollar amount.

1st year \$ 15.22
 2nd year 18.90
 3rd year 21.81
 4th year 27.58

8-NYDCT9-DWT

Painter - Bridge & Structural Steel

10/01/2022

JOB DESCRIPTION Painter - Bridge & Structural Steel

DISTRICT 8

ENTIRE COUNTIES

Albany, Bronx, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Kings, Montgomery, Nassau, New York, Orange, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

WAGES

Per Hour:

STEEL:
 Bridge Painting: 07/01/2022 10/01/2022
 \$ 53.00 \$ 54.50
 + 9.63* + 10.10*

ADDITIONAL \$6.00 per hour for POWER TOOL/SPRAY, whether straight time or overtime.

NOTE: All premium wages are to be calculated on base rate per hour only.

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

NOTE: Generally, for Bridge Painting Contracts, ALL WORKERS on and off the bridge (including Flagmen) are to be paid Painter's Rate; the contract must be ONLY for Bridge Painting.

SHIFT WORK:

When directly specified in public agency or authority contract documents for an employer to work a second shift and works the second shift with employees other than from the first shift, all employees who work the second shift will be paid 10% of the base wage shift differential in lieu of overtime for the first eight (8) hours worked after which the employees shall be paid at time and one half of the regular wage rate. When a single irregular work shift is mandated in the job specifications or by the contracting agency, wages shall be paid at time and one half for single shifts between the hours of 3pm-11pm or 11pm-7am.

SUPPLEMENTAL BENEFITS

Per Hour:

Journeyworker:	\$ 10.90	\$ 11.78
	+ 30.60*	+ 30.75*

* For the period of May 1st to November 15th, this amount is payable up to 40 hours. For the period of Nov 16th to April 30th, this amount is payable up to 50 hours. EXCEPTION: First and last week of employment, and for the weeks of Memorial Day, Independence Day and Labor Day, where the amount is paid for the actual number of hours worked (no cap).

OVERTIME PAY

See (B, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (4, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wage - Per hour:

Apprentices: (1) year terms

1st year	\$ 21.20	\$ 21.80
	+ 3.86	+ 4.04
2nd year	\$ 31.80	\$ 32.70
	+ 5.78	+ 6.06
3rd year	\$ 42.40	\$ 43.60
	+ 7.70	+ 8.08
Supplemental Benefits - Per hour:		
1st year	\$.25	\$.25
	+ 12.24	+ 12.34
2nd year	\$ 10.90	\$ 10.90
	+ 18.36	+ 18.51
3rd year	\$ 10.90	\$ 10.90
	+ 24.48	+ 24.68

NOTE: All premium wages are to be calculated on base rate per hour only.

8-DC-9/806/155-BrSS

Painter - Line Striping

10/01/2022

JOB DESCRIPTION Painter - Line Striping

DISTRICT 8

ENTIRE COUNTIES

Albany, Clinton, Columbia, Dutchess, Essex, Franklin, Fulton, Greene, Hamilton, Montgomery, Nassau, Orange, Putnam, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Suffolk, Sullivan, Ulster, Warren, Washington, Westchester

WAGES

Per hour:

Painter (Striping-Highway):	07/01/2022
Striping-Machine Operator*	\$ 31.53
Linerman Thermoplastic	38.34

Note: * Includes but is not limited to: Positioning of cones and directing of traffic using hand held devices. Excludes the Driver/Operator of equipment used in the maintenance and protection of traffic safety.

Four (4), ten (10) hour days may be worked at straight time during a week, Monday thru Thursday. Friday may be used as a make-up day.

NOTE - In order to use the '4 Day/10 Hour Work Schedule,' as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour paid:

Journeyworker:	
Striping Machine Operator:	\$ 10.03
Linerman Thermoplastic:	10.03

OVERTIME PAY

See (B, B2, E2, F, S) on OVERTIME PAGE

HOLIDAY

Paid:	See (5, 20) on HOLIDAY PAGE
Overtime:	See (5, 20) on HOLIDAY PAGE

REGISTERED APPRENTICES

One (1) year terms at the following wage rates:

1st Term:	\$ 15.00
2nd Term:	18.92
3rd Term:	25.22

Supplemental Benefits per hour:

1st term:	\$ 9.16
2nd Term:	10.03
3rd Term:	10.03

8-1456-LS

Painter - Metal Polisher

10/01/2022

JOB DESCRIPTION Painter - Metal Polisher

DISTRICT 8

ENTIRE COUNTIES

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

	07/01/2022
Metal Polisher	\$ 37.78
Metal Polisher*	38.80
Metal Polisher**	41.78

*Note: Applies on New Construction & complete renovation

** Note: Applies when working on scaffolds over 34 feet.

SUPPLEMENTAL BENEFITS

Per Hour: 07/01/2022

Journeyworker:	
All classification	\$ 11.24

OVERTIME PAY

See (B, E, P, T) on OVERTIME PAGE

HOLIDAY

Paid:	See (5, 6, 11, 15, 16, 25, 26) on HOLIDAY PAGE
Overtime:	See (5, 6, 9, 11, 15, 16, 25, 26) on HOLIDAY PAGE

REGISTERED APPRENTICES

Wages per hour:

One (1) year term at the following wage rates:

	07/01/2022
1st year	\$ 16.00
2nd year	17.00
3rd year	18.00

1st year*	\$ 16.39
2nd year*	17.44
3rd year*	18.54
1st year**	\$ 18.50
2nd year**	19.50
3rd year**	20.50

*Note: Applies to New Construction & complete renovation
 ** Note: Applies when working on scaffolds over 34 feet.

Supplemental benefits:
 Per hour:

1st year	\$ 7.99
2nd year	7.99
3rd year	7.99

8-8A/28A-MP

Plumber **10/01/2022**

JOB DESCRIPTION Plumber

DISTRICT 8

ENTIRE COUNTIES
 Putnam, Westchester

WAGES
 Per hour:

07/01/2022

Plumber and Steamfitter	\$ 60.21
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SHIFT WORK:

When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker	\$ 40.01
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OVERTIME PAY

See (B, E, E2, Q, V) on OVERTIME PAGE
 OVERTIME:... See on OVERTIME PAGE.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1)year terms at the following wages:

1st Term	\$ 22.36
2nd Term	25.66
3rd Term	29.63
4th Term	42.28
5th Term	45.36

Supplemental Benefits per hour:

1st term	\$ 16.54
2nd term	18.46
3rd term	21.96
4th term	28.95
5th term	30.68

8-21.1-ST

Plumber - HVAC / Service **10/01/2022**

JOB DESCRIPTION Plumber - HVAC / Service

DISTRICT 8

ENTIRE COUNTIES

Dutchess, Putnam, Westchester

PARTIAL COUNTIES

Delaware: Only the townships of Middletown and Roxbury

Ulster: Entire County(including Wallkill and Shawangunk Prisons) except for remainder of Town of Shawangunk and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES

Per hour: 07/01/2022

HVAC Service \$ 41.68
+ \$ 4.32*

*Note: This portion of wage is not subject to overtime premium.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker HVAC Service
\$ 27.79

OVERTIME PAY

See (B, F, R) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 16, 25) on HOLIDAY PAGE

Overtime: See (5, 6, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

HVAC SERVICE

(1)year terms at the following wages:

1st yr.	2nd yr.	3rd yr.	4th yr.	5th yr.
\$ 18.87	\$ 22.36	\$ 27.91	\$ 34.33	\$ 37.25
+\$2.37*	+\$2.67*	+\$3.22*	+\$3.84*	+\$4.07*

*Note: This portion of wage is not subject to overtime premium.

Supplemental Benefits per hour:

Apprentices 07/01/2022

1st term	\$ 20.30
2nd term	21.62
3rd term	23.07
4th term	25.05
5th term	26.47

8-21.1&2-SF/Re/AC

Plumber - Jobbing & Alterations

10/01/2022

JOB DESCRIPTION Plumber - Jobbing & Alterations

DISTRICT 8

ENTIRE COUNTIES

Dutchess, Putnam, Westchester

PARTIAL COUNTIES

Ulster: Entire county (including Wallkill and Shawangunk Prisons in Town of Shawangunk) EXCEPT for remainder of Town of Shawangunk, and Towns of Plattekill, Marlboro, and Wawarsing.

WAGES

Per hour: 07/01/2022

Journeyworker: \$ 46.79

Repairs, replacements and alteration work is any repair or replacement of a present plumbing system that does not change existing roughing or water supply lines.

SHIFT WORK:

When directly specified in public agency or authority contract documents, shift work outside the regular hours of work shall be comprised of eight (8) hours per shift not including Saturday, Sundays and holidays. One half (1/2) hour shall be allowed for lunch after the first four (4) hours of each shift. Wage and Fringes for shift work shall be straight time plus a shift premium of twenty-five (25%) percent. A minimum of five days Monday through Friday must be worked to establish shift work.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker

\$ 33.56

OVERTIME PAY

See (B, *E, E2, Q, V) on OVERTIME PAGE

*When used as a make-up day, hours after 8 on Saturday shall be paid at time and one half.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6, 8, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year terms at the following wages:

1st year	\$ 20.25
2nd year	22.48
3rd year	24.40
4th year	34.25
5th year	36.19

Supplemental Benefits per hour:

1st year	\$ 10.98
2nd year	12.92
3rd year	16.89
4th year	22.82
5th year	24.77

8-21.3-J&A

Roofer

10/01/2022

JOB DESCRIPTION Roofer

DISTRICT 9

ENTIRE COUNTIES

Bronx, Dutchess, Kings, New York, Orange, Putnam, Queens, Richmond, Rockland, Sullivan, Ulster, Westchester

WAGES

Per Hour:	07/01/2022	05/01/2023
		Additional
Roofer/Waterproofer	\$ 45.25	\$ 2.00
	+ \$7.00*	

* This portion is not subjected to overtime premiums.

Note: Abatement/Removal of Asbestos containing roofs and roofing material is classified as Roofer.

SUPPLEMENTAL BENEFITS

Per Hour: \$ 30.62

OVERTIME PAY

See (B, H) on OVERTIME PAGE

Note: An observed holiday that falls on a Sunday will be observed the following Monday.

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

REGISTERED APPRENTICES

(1) year term

1st	2nd	3rd	4th
\$ 15.84	\$ 22.63	\$ 27.15	\$ 33.94
	+ 3.50*	+ 4.20*	+ 5.26*

Supplements:

1st	2nd	3rd	4th
\$ 3.88	\$ 15.48	\$ 18.50	\$ 23.04

* This portion is not subjected to overtime premiums.

Sheetmetal Worker **10/01/2022**

JOB DESCRIPTION Sheetmetal Worker **DISTRICT 8**

ENTIRE COUNTIES
 Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

WAGES

	07/01/2022
SheetMetal Worker	\$ 45.25
	+ 3.52*

*This portion is not subject to overtime premiums.

SHIFT WORK
 For all NYS D.O.T. and other Governmental mandated off-shift work:
 10% increase for additional shifts for a minimum of five (5) days

SUPPLEMENTAL BENEFITS
 Journeyworker \$ 45.20

OVERTIME PAY
 OVERTIME:... See (B, E, Q,) on OVERTIME PAGE.

HOLIDAY
 Paid: See (1) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 15, 16, 23) on HOLIDAY PAGE

REGISTERED APPRENTICES

1st	2nd	3rd	4th	5th	6th	7th	8th
\$ 16.79	\$ 18.88	\$ 21.00	\$ 23.08	\$ 25.20	\$ 27.30	\$ 29.89	\$ 32.43
+ 1.41*	+ 1.58*	+ 1.76*	+ 1.94*	+ 2.11*	+ 2.29*	+ 2.46*	+ 2.64*

*This portion is not subject to overtime premiums.

Supplemental Benefits per hour:

Apprentices

1st term	\$ 19.37
2nd term	21.81
3rd term	24.21
4th term	26.65
5th term	29.06
6th term	31.48
7th term	33.42
8th term	35.40

Sheetmetal Worker **10/01/2022**

JOB DESCRIPTION Sheetmetal Worker **DISTRICT 4**

ENTIRE COUNTIES
 Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, Westchester

WAGES

Per Hour:	07/01/2022
Sign Erector	\$ 53.79

NOTE: Structurally Supported Overhead Highway Signs(See STRUCTURAL IRON WORKER CLASS)

SUPPLEMENTAL BENEFITS

Per Hour:	07/01/2022
Sign Erector	\$ 53.33

OVERTIME PAY
 See (A, F, S) on OVERTIME PAGE

HOLIDAY
 Paid: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE
 Overtime: See (5, 6, 10, 11, 12, 16, 25) on HOLIDAY PAGE

REGISTERED APPRENTICES

Per Hour:

6 month Terms at the following percentage of Sign Erectors wage rate:

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
35%	40%	45%	50%	55%	60%	65%	70%	75%	80%

SUPPLEMENTAL BENEFITS

Per Hour:

07/01/2022

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 14.34	\$ 16.26	\$ 18.17	\$ 20.10	\$ 28.02	\$ 30.47	\$ 33.72	\$ 36.27	\$ 38.77	\$ 41.29

4-137-SE

Sprinkler Fitter

10/01/2022

JOB DESCRIPTION Sprinkler Fitter

DISTRICT 1

ENTIRE COUNTIES

Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester

WAGES

Per hour 07/01/2022

Sprinkler Fitter \$ 48.98

SUPPLEMENTAL BENEFITS

Per hour

Journeyman \$ 29.13

OVERTIME PAY

See (B, E, Q) on OVERTIME PAGE

HOLIDAY

Paid: See (1) on HOLIDAY PAGE

Overtime: See (5, 6) on HOLIDAY PAGE

Note: When a holiday falls on Sunday, the following Monday shall be considered a holiday and all work performed on either day shall be at the double time rate. When a holiday falls on Saturday, the preceding Friday shall be considered a holiday and all work performed on either day shall be at the double time rate.

REGISTERED APPRENTICES

Wages per hour

One Half Year terms at the following wage.

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 23.70	\$ 26.34	\$ 28.72	\$ 31.35	\$ 33.99	\$ 36.62	\$ 39.25	\$ 41.89	\$ 44.52	\$ 47.15

Supplemental Benefits per hour

1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
\$ 8.37	\$ 8.37	\$ 19.76	\$ 19.76	\$ 20.01	\$ 20.01	\$ 20.01	\$ 20.01	\$ 20.01	\$ 20.01

1-669.2

Teamster - Building / Heavy&Highway

10/01/2022

JOB DESCRIPTION Teamster - Building / Heavy&Highway

DISTRICT 8

ENTIRE COUNTIES

Putnam, Westchester

WAGES

GROUP A: Straight Trucks (6-wheeler and 10-wheeler), A-frame, Winch, Dynamite Seeding, Mulching, Agitator, Water, Attenuator, Light Towers, Cement (all types), Suburban, Station Wagons, Cars, Pick Ups, any vehicle carrying materials of any kind.

GROUP AA: Tack Coat

GROUP B: Tractor & Trailers (all types).

GROUP BB: Tri-Axle, 14 Wheeler

GROUP C: Low Boy (carrying equipment).

GROUP D: Fuel Trucks, Tire Trucks.

GROUP E: Off-road Equipment (over 40 tons): Athey Wagons, Belly Dumps, Articulated Dumps, Trailer Wagons.
 GROUP F: Off-road Equipment (over 40 tons) Euclid, DJB.
 GROUP G: Off-road Equipment (under 40 tons) Athey Wagons, Belly Articulated Dumps, Trailer Wagons.
 GROUP H: Off-road Equipment(under 40 tons), Euclid.
 GROUP HH: Off-road Equipment(under 40 tons) D.J.B.
 GROUP I: Off-road Equipment(under 40 tons) Darts.
 GROUP II: Off-road Equipment(under 40 tons) RXS.

WAGES:(per hour)

07/01/2022

GROUP A	\$ 46.07*
GROUP AA	49.07*
GROUP B	46.69*
GROUP BB	46.19*
GROUP C	48.82*
GROUP D	46.52*
GROUP E	47.07*
GROUP F	48.07*
GROUP G	46.82*
GROUP H	47.44*
GROUP HH	47.82*
GROUP I	47.57*
GROUP II	47.94*

* To calculate premium wage, subtract \$.20 from the hourly wage.

Note: Fuel truck operators on construction sites addit. \$5.00 per day.
 For work on hazardous/toxic waste site addit. 20% of hourly rate.

Shift Differential: When mandated by the contracting agency, DOT, or any governmental agency contracts shall receive a shift differential of fifteen (15%) above the wage rate.

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

NOTE - In order to use the '4 Day/10 Hour Work schedule', as your normal schedule, you must submit an 'Employer Registration for Use of 4 Day/10 Hour Work Schedule,' form PW30.1; and there must be a dispensation of hours in place on the project. If the PW30.1 is not submitted you may be liable for overtime payments for work over 8 hours per day.

SUPPLEMENTAL BENEFITS

Per hour:

Journeyworker

First 40 hours	\$ 33.87
41st-45th hours	14.88
Over 45 hours	0.75

OVERTIME PAY

See (B, E, P, R) on OVERTIME PAGE

HOLIDAY

Paid: See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE
 Overtime: See (5, 6, 8, 9, 15, 25) on HOLIDAY PAGE

8-456

Welder

10/01/2022

JOB DESCRIPTION Welder

DISTRICT 1

ENTIRE COUNTIES

Albany, Allegany, Bronx, Broome, Cattaraugus, Cayuga, Chautauqua, Chemung, Chenango, Clinton, Columbia, Cortland, Delaware, Dutchess, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Herkimer, Jefferson, Kings, Lewis, Livingston, Madison, Monroe, Montgomery, Nassau, New York, Niagara, Oneida, Onondaga, Ontario, Orange, Orleans, Oswego, Otsego, Putnam, Queens, Rensselaer, Richmond, Rockland, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, St. Lawrence, Steuben, Suffolk, Sullivan, Tioga, Tompkins, Ulster, Warren, Washington, Wayne, Westchester, Wyoming, Yates

WAGES

Per hour 07/01/2022

Welder: To be paid the same rate of the mechanic performing the work.*

*EXCEPTION: If a specific welder certification is required, then the 'Certified Welder' rate in that trade tag will be paid.

OVERTIME PAY
HOLIDAY

1-As Per Trade

Overtime Codes

Following is an explanation of the code(s) listed in the OVERTIME section of each classification contained in the attached schedule. Additional requirements may also be listed in the HOLIDAY section.

NOTE: Supplemental Benefits are 'Per hour worked' (for each hour worked) unless otherwise noted

- (AA) Time and one half of the hourly rate after 7 and one half hours per day
- (A) Time and one half of the hourly rate after 7 hours per day
- (B) Time and one half of the hourly rate after 8 hours per day
- (B1) Time and one half of the hourly rate for the 9th & 10th hours week days and the 1st 8 hours on Saturday.
Double the hourly rate for all additional hours
- (B2) Time and one half of the hourly rate after 40 hours per week
- (C) Double the hourly rate after 7 hours per day
- (C1) Double the hourly rate after 7 and one half hours per day
- (D) Double the hourly rate after 8 hours per day
- (D1) Double the hourly rate after 9 hours per day
- (E) Time and one half of the hourly rate on Saturday
- (E1) Time and one half 1st 4 hours on Saturday; Double the hourly rate all additional Saturday hours
- (E2) Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E3) Between November 1st and March 3rd Saturday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather, provided a given employee has worked between 16 and 32 hours that week
- (E4) Saturday and Sunday may be used as a make-up day at straight time when a day is lost during that week due to inclement weather
- (E5) Double time after 8 hours on Saturdays
- (F) Time and one half of the hourly rate on Saturday and Sunday
- (G) Time and one half of the hourly rate on Saturday and Holidays
- (H) Time and one half of the hourly rate on Saturday, Sunday, and Holidays
- (I) Time and one half of the hourly rate on Sunday
- (J) Time and one half of the hourly rate on Sunday and Holidays
- (K) Time and one half of the hourly rate on Holidays
- (L) Double the hourly rate on Saturday
- (M) Double the hourly rate on Saturday and Sunday
- (N) Double the hourly rate on Saturday and Holidays
- (O) Double the hourly rate on Saturday, Sunday, and Holidays
- (P) Double the hourly rate on Sunday
- (Q) Double the hourly rate on Sunday and Holidays
- (R) Double the hourly rate on Holidays
- (S) Two and one half times the hourly rate for Holidays

- (S1) Two and one half times the hourly rate the first 8 hours on Sunday or Holidays One and one half times the hourly rate all additional hours.
- (T) Triple the hourly rate for Holidays
- (U) Four times the hourly rate for Holidays
- (V) Including benefits at SAME PREMIUM as shown for overtime
- (W) Time and one half for benefits on all overtime hours.
- (X) Benefits payable on Paid Holiday at straight time. If worked, additional benefit amount will be required for worked hours. (Refer to other codes listed.)

Holiday Codes

PAID Holidays:

Paid Holidays are days for which an eligible employee receives a regular day's pay, but is not required to perform work. If an employee works on a day listed as a paid holiday, this remuneration is in addition to payment of the required prevailing rate for the work actually performed.

OVERTIME Holiday Pay:

Overtime holiday pay is the premium pay that is required for work performed on specified holidays. It is only required where the employee actually performs work on such holidays. The applicable holidays are listed under HOLIDAYS: OVERTIME. The required rate of pay for these covered holidays can be found in the OVERTIME PAY section listings for each classification.

Following is an explanation of the code(s) listed in the HOLIDAY section of each classification contained in the attached schedule. The Holidays as listed below are to be paid at the wage rates at which the employee is normally classified.

- (1) None
- (2) Labor Day
- (3) Memorial Day and Labor Day
- (4) Memorial Day and July 4th
- (5) Memorial Day, July 4th, and Labor Day
- (6) New Year's, Thanksgiving, and Christmas
- (7) Lincoln's Birthday, Washington's Birthday, and Veterans Day
- (8) Good Friday
- (9) Lincoln's Birthday
- (10) Washington's Birthday
- (11) Columbus Day
- (12) Election Day
- (13) Presidential Election Day
- (14) 1/2 Day on Presidential Election Day
- (15) Veterans Day
- (16) Day after Thanksgiving
- (17) July 4th
- (18) 1/2 Day before Christmas
- (19) 1/2 Day before New Years
- (20) Thanksgiving
- (21) New Year's Day
- (22) Christmas
- (23) Day before Christmas
- (24) Day before New Year's
- (25) Presidents' Day
- (26) Martin Luther King, Jr. Day
- (27) Memorial Day
- (28) Easter Sunday

(29) Juneteenth



**New York State Department of Labor - Bureau of Public Work
State Office Building Campus
Building 12 - Room 130
Albany, New York 12240**

REQUEST FOR WAGE AND SUPPLEMENT INFORMATION

As Required by Articles 8 and 9 of the NYS Labor Law

Fax (518) 485-1870 or mail this form for new schedules or for determination for additional occupations.

This Form Must Be Typed

Submitted By:

(Check Only One)

Contracting Agency

Architect or Engineering Firm

Public Work District Office

Date:

A. Public Work Contract to be let by: (Enter Data Pertaining to Contracting/Public Agency)

1. Name and complete address (Check if new or change)

Telephone: ()

Fax: ()

E-Mail:

2. NY State Units (see Item 5)

01 DOT

02 OGS

03 Dormitory Authority

04 State University
Construction Fund

05 Mental Hygiene
Facilities Corp.

06 OTHER N.Y. STATE UNIT

07 City

08 Local School District

09 Special Local District, i.e.,
Fire, Sewer, Water District

10 Village

11 Town

12 County

13 Other Non-N.Y. State
(Describe)

3. SEND REPLY TO check if new or change)
Name and complete address:

Telephone:()

Fax: ()

E-Mail:

4. SERVICE REQUIRED. Check appropriate box and provide project information.

New Schedule of Wages and Supplements.

APPROXIMATE BID DATE :

Additional Occupation and/or Redetermination

PRC NUMBER ISSUED PREVIOUSLY FOR
THIS PROJECT :

OFFICE USE ONLY

B. PROJECT PARTICULARS

5. Project Title _____

Description of Work _____

Contract Identification Number _____

Note: For NYS units, the OSC Contract No. _____

6. Location of Project:
Location on Site _____

Route No/Street Address _____

Village or City _____

Town _____

County _____

7. Nature of Project - Check One:

- 1. New Building
- 2. Addition to Existing Structure
- 3. Heavy and Highway Construction (New and Repair)
- 4. New Sewer or Waterline
- 5. Other New Construction (Explain)
- 6. Other Reconstruction, Maintenance, Repair or Alteration
- 7. Demolition
- 8. Building Service Contract

8. OCCUPATION FOR PROJECT :

- Construction (Building, Heavy Highway/Sewer/Water)
- Tunnel
- Residential
- Landscape Maintenance
- Elevator maintenance
- Exterminators, Fumigators
- Fire Safety Director, NYC Only
- Guards, Watchmen
- Janitors, Porters, Cleaners, Elevator Operators
- Moving furniture and equipment
- Trash and refuse removal
- Window cleaners
- Other (Describe)

9. Has this project been reviewed for compliance with the Wicks Law involving separate bidding? YES NO

10. Name and Title of Requester

Signature



NEW YORK STATE DEPARTMENT OF LABOR
Bureau of Public Work - Debarment List

**LIST OF EMPLOYERS INELIGIBLE TO BID ON OR BE
AWARDED ANY PUBLIC WORK CONTRACT**

Under Article 8 and Article 9 of the NYS Labor Law, a contractor, sub-contractor and/or its successor shall be debarred and ineligible to submit a bid on or be awarded any public work or public building service contract/sub-contract with the state, any municipal corporation or public body for a period of five (5) years from the date of debarment when:

- Two (2) final determinations have been rendered within any consecutive six-year (6) period determining that such contractor, sub-contractor and/or its successor has WILLFULLY failed to pay the prevailing wage and/or supplements;
- One (1) final determination involves falsification of payroll records or the kickback of wages and/or supplements.

The agency issuing the determination and providing the information, is denoted under the heading 'Fiscal Officer'. DOL = New York State Department of Labor; NYC = New York City Comptroller's Office; AG = New York State Attorney General's Office; DA = County District Attorney's Office.

Debarment Database: To search for contractors, sub-contractors and/or their successors debarred from bidding or being awarded any public work contract or subcontract under NYS Labor Law Articles 8 and 9, or under NYS Workers' Compensation Law Section 141-b, access the database at this link: <https://applications.labor.ny.gov/EDList/searchPage.do>

For inquiries where WCB is listed as the "Agency", please call 1-866-546-9322

NYSDOL Bureau of Public Work Debarment List 10/21/2022

Article 8

AGENCY	Fiscal Officer	FEIN	EMPLOYER NAME	EMPLOYER DBA NAME	ADDRESS	DEBARMENT START DATE	DEBARMENT END DATE
DOL	DOL	*****5754	0369 CONTRACTORS, LLC		515 WEST AVE UNIT PH 13NORWALK CT 06850	05/12/2021	05/12/2026
DOL	DOL	*****4018	ADIRONDACK BUILDING RESTORATION INC.		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	AG	*****1812	ADVANCED BUILDERS & LAND DEVELOPMENT, INC.		400 OSER AVE #2300HAUPPAUGE NY 11788	09/11/2019	09/11/2024
DOL	DOL	*****1687	ADVANCED SAFETY SPRINKLER INC		261 MILL ROAD P.O BOX 296EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	NYC	*****6775	ADVENTURE MASONRY CORP.		1535 RICHMOND AVENUE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	NYC		AGOSTINHO TOME		405 BARRETTO ST BRONX NY 10474	05/31/2018	05/31/2023
DOL	NYC		AMJED PARVEZ		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL		ANGELO F COKER		2610 SOUTH SALINA STREET SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		ANGELO F COKER		2610 SOUTH SALINA STREET SUITE 14SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL		ANGELO GARCIA		515 WEST AVE UNIT PH 13NORWALK CT 06850	05/12/2021	05/12/2026
DOL	DOL		ANGELO TONDO		449 WEST MOMBASHA ROAD MONROE NY 10950	06/06/2022	06/06/2027
DOL	DOL		ANITA SALERNO		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	DOL		ANTONIO ESTIVEZ		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	NYC		ARADCO CONSTRUCTION CORP		115-46 132RD ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	DOL		ARNOLD A. PAOLINI		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC		ARSHAD MEHMOOD		168-42 88TH AVENUE JAMAICA NY 11432	11/20/2019	11/20/2024
DOL	NYC	*****2591	AVI 212 INC.		260 CROSEY AVENUE APT 11GBROOKLYN NY 11214	10/30/2018	10/30/2023
DOL	NYC		AVM CONSTRUCTION CORP		117-72 123RD ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	NYC		AZIDABEGUM		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	DOL	*****8421	B & B DRYWALL, INC		206 WARREN AVE APT 1WHITE PLAINS NY 10603	12/14/2021	12/14/2026
DOL	NYC		BALWINDER SINGH		421 HUDSON ST SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024
DOL	NYC	*****8416	BEAM CONSTRUCTION, INC.		50 MAIN ST WHITE PLAINS NY 10606	01/04/2019	01/04/2024
DOL	DOL		BERNARD BEGLEY		38 LONG RIDGE ROAD BEDFORD NY 10506	12/18/2019	12/18/2024
DOL	NYC	*****2113	BHW CONTRACTING, INC.		401 HANOVER AVENUE STATEN ISLAND NY 10304	01/11/2021	01/11/2026
DOL	DOL		BIAGIO CANTISANI			06/12/2018	06/12/2023
DOL	DOL	*****3627	BJB CONSTRUCTION CORP.		38 LONG RIDGE ROAD BEDFORD NY 10506	12/18/2019	12/18/2024
DOL	DOL	*****4512	BOB BRUNO EXCAVATING, INC		5 MORNINGSIDE DR AUBURN NY 13021	05/28/2019	05/28/2024
DOL	DOL		BOGDAN MARKOVSKI		370 W. PLEASANTVIEW AVE SUITE 2.329HACKENSACK NJ 07601	02/11/2019	02/11/2024
DOL	DOL		BRADLEY J SCHUKA		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	DOL		BRUCE P. NASH JR.		5841 BUTTERNUT ROAD EAST SYRACUSE NY 13057	09/12/2018	09/12/2023
DOL	DOL	*****0225	C&D LAFACE CONSTRUCTION, INC.		8531 OSWEGO RD BALDWINSVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	*****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL	*****9383	C.C. PAVING AND EXCAVATING, INC.		2610 SOUTH SALINA ST SUITE 12SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL	*****1080	C.D. ENTERPRISES, INC.		50 CROSEY AVE APT 11GBROOKLYN NY 11214	10/30/2018	10/30/2023

NYSDOL Bureau of Public Work Debarment List 10/21/2022

Article 8

DOL	DOL	*****5161	CALADRI DEVELOPMENT CORP.		1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	DOL	*****3391	CALI ENTERPRISES, INC.		1223 PARK STREET PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		CALVIN WALTERS		465 EAST THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL		CANTISANI & ASSOCIATES LTD		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CANTISANI HOLDING LLC			06/12/2018	06/12/2023
DOL	DOL		CARMEN RACHETTA		8531 OSWEGO RD BALDWINVILLE NY 13027	02/03/2020	02/03/2025
DOL	DOL		CARMENA RACHETTA		8531 OSWEGO ROAD BALDWINVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	*****3812	CARMODY "2" INC			06/12/2018	06/12/2023
DOL	DOL	*****1143	CARMODY BUILDING CORP	CARMODY CONTRACTING AND CARMODY CONTRACTING CORP.	442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY CONCRETE CORPORATION			06/12/2018	06/12/2023
DOL	DOL		CARMODY ENTERPRISES, LTD.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY INC		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****3812	CARMODY INDUSTRIES INC			06/12/2018	06/12/2023
DOL	DOL		CARMODY MAINTENANCE CORPORATION		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		CARMODY MASONRY CORP		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	AG	*****7247	CENTURY CONCRETE CORP		2375 RAYNOR ST RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	AG		CESAR J. AGUDELO		81-06 34TH AVENUE APT. 6E JACKSON HEIGHTS NY 11372	02/07/2018	02/07/2023
DOL	DOL	*****0026	CHANTICLEER CONSTRUCTION LLC		4 BROTHERS ROAD WAPPINGERS FALLS NY 12590	10/20/2020	10/20/2025
DOL	NYC		CHARLES ZAHRADKA		863 WASHINGTON STREET FRANKLIN SQUARE NY 11010	03/10/2020	03/10/2025
DOL	DOL		CHRISTOPHER GRECO		26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL		CHRISTOPHER J MAINI		19 CAITLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	DOL		CHRISTOPHER PAPANSTEFANOU A/K/A CHRIS PAPANSTEFANOU		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL	*****1927	CONSTRUCTION PARTS WAREHOUSE, INC.	CPW	5841 BUTTERNUT ROAD EAST SYRACUSE NY 13057	09/12/2018	09/12/2023
DOL	DOL	*****3228	CROSS-COUNTY LANDSCAPING AND TREE SERVICE, INC.	ROCKLAND TREE SERVICE	26 NORTH MYRTLE AVENUE SPRING VALLEY NY 10956	02/18/2021	02/18/2026
DOL	DOL	*****2524	CSI ELECTRICAL & MECHANICAL INC		42-32 235TH ST DOUGLSTON NY 11363	01/14/2019	01/14/2024
DOL	DOL	*****7619	DANCO CONSTRUCTION UNLIMITED INC.		485 RAFT AVENUE HOLBROOK NY 11741	10/19/2021	10/19/2026
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2C SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DOL		DARIAN L COKER		2610 SOUTH SALINA ST SUITE 2C SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	NYC		DAVID WEINER		14 NEW DROP LANE 2ND FLOOR STATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	AG		DEBRA MARTINEZ		31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	DOL		DELPHI PAINTING & DECORATING CO INC		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL		DOMENICO LAFACE		8531 OSWEGO RD BALDWINVILLE NY 13027	02/03/2020	01/09/2023
DOL	DOL	*****5175	EAGLE MECHANICAL AND GENERAL CONSTRUCTION LLC		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025

NYSDOL Bureau of Public Work Debarment List 10/21/2022

Article 8

DOL	DOL		EAST COAST PAVING		2238 BAKER RD GILLET PA 16923	03/12/2018	03/12/2023
DOL	AG		EDWIN HUTZLER		23 NORTH HOWELLS RD BELLPORT NY 11713	08/04/2021	08/04/2026
DOL	DA		EDWIN HUTZLER		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	*****0780	EMES HEATING & PLUMBING CONTR		5 EMES LANE MONSEY NY 10952	01/20/2002	01/20/3002
DOL	NYC	*****5917	EPOCH ELECTRICAL, INC		97-18 50TH AVE CORONA NY 11368	04/19/2018	04/19/2024
DOL	DOL		FAIGY LOWINGER		11 MOUNTAIN RD 28 VAN BUREN DRMONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL		FRANK BENEDETTO		19 CATLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	DOL	*****4722	FRANK BENEDETTO AND CHRISTOPHER J MAINI	B & M CONCRETE	19 CAITLIN AVE JAMESTOWN NY 14701	09/17/2018	09/17/2023
DOL	NYC		FRANK MAINI		1766 FRONT ST YORKTOWN HEIGHTS NY 10598	01/17/2018	01/17/2023
DOL	DA		FREDERICK HUTZLER		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	NYC	*****6616	G & G MECHANICAL ENTERPRISES, LLC.		1936 HEMPSTEAD TURNPIKE EAST MEDOW NY 11554	11/29/2019	11/29/2024
DOL	DOL		GABRIEL FRASSETTI			04/10/2019	04/10/2024
DOL	NYC		GAYATRI MANGRU		21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	DOL		GEOFF CORLETT		415 FLAGGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DA		GEORGE LUCEY		150 KINGS STREET BROOKLYN NY 11231	01/19/1998	01/19/2998
DOL	DOL		GIGI SCHNECKENBURGER		261 MILL RD EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DOL		GIOVANNI LAFACE		8531 OSWEGO RD BALDWINVILLE NY 13027	02/03/2020	01/09/2023
DOL	NYC	*****3164	GLOBE GATES INC	GLOBAL OVERHEAD DOORS	405 BARRETTO ST BRONX NY 10474	05/31/2018	05/31/2023
DOL	DOL		GREGORY S. OLSON		P.O BOX 100 200 LATTA BROOK PARKHORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		HANS RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	NYC	*****3228	HEIGHTS ELEVATOR CORP.		1766 FRONT ST YORKTOWN HEIGHTS NY 10598	01/17/2018	01/17/2023
DOL	DOL	*****5131	INTEGRITY MASONRY, INC.	M&R CONCRETE	722 8TH AVE WATERVLIET NY 12189	06/05/2018	06/05/2023
DOL	DOL		IRENE KASSELIS		32 PENNINGTON AVE WALDWICK NJ 07463	05/30/2019	05/30/2024
DOL	DOL	*****9211	J. WASE CONSTRUCTION CORP.		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	DOL		J.A. HIRES CADWALLADER		P.O BOX 100 200 LATTA BROOK PARKHORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		JAMES C. DELGIACCO		722 8TH AVE WATERVLIET NY 12189	06/05/2018	06/05/2023
DOL	DOL		JAMES J. BAKER		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL		JAMES LIAZONE		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		JAMES RACHEL		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL		JASON P. RACE		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	*****7993	JBS DIRT, INC.		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL	*****5368	JCH MASONRY & LANDSCAPING INC.		35 CLINTON AVE OSSINING NY 10562	09/12/2018	09/12/2023
DOL	NYC		JENNIFER GUERRERO		1000 HEMPSTEAD TURNPIKE EAST MEDOW NY 11554	11/03/2019	11/03/2024

NYSDOL Bureau of Public Work Debarment List 10/21/2022

Article 8

DOL	DOL		JIM PLAUGHER		17613 SANTE FE LINE ROAD WAYNEFIELD OH 45896	07/16/2021	07/16/2026
DOL	AG		JOHN ANTHONY MASSINO		36-49 204TH STREET BAYSIDE NY 11372	02/07/2018	02/07/2023
DOL	DOL		JOHN F. CADWALLADER		200 LATTA BROOK PARK HORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL	****4612	JOHN F. CADWALLADER, INC.	THE GLASS COMPANY	P.O BOX 100 200 LATTA BROOK PARKHORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL		JOHN GOCEK		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL		JOHN LUCIANO			05/14/2018	05/14/2023
DOL	DOL		JOHN MARKOVIC		47 MANDON TERRACE HAWTHORN NJ 07506	03/29/2021	03/29/2026
DOL	DOL		JOHN WASE		8545 RT 9W ATHENS NY 12015	03/09/2021	03/09/2026
DOL	AG	****0600	JOHNCO CONTRACTING, INC.		36-49 204TH STREET BAYSIDE NY 11372	02/07/2018	02/07/2023
DOL	DOL		JON E DEYOUNG		261 MILL RD P.O BOX 296EAST AURORA NY 14052	05/29/2019	05/29/2024
DOL	DOL		JORGE RAMOS		8970 MIKE GARCIA DR MANASSAS VA 20109	07/16/2021	07/16/2026
DOL	DOL		JORI PEDERSEN		415 FLAGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DOL		JOSE CHUCHUCA		35 CLINTON AVE OSSINING NY 10562	09/12/2018	09/12/2023
DOL	NYC		JOSEPH MARTINO		1535 RICHMOND AVENUE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	DOL		JOY MARTIN		2404 DELAWARE AVE NIGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL	****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL	****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL	****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL	****5116	JP RACE PAINTING, INC. T/A RACE PAINTING		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL		JULIUS AND GITA BEHREND		5 EMES LANE MONSEY NY 10952	11/20/2002	11/20/3002
DOL	DOL		KARIN MANGIN		796 PHELPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	DOL		KATE E. CONNOR		7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL		KATIE BURDICK		2238 BAKER RD GILLET PA 16923	03/12/2018	03/12/2023
DOL	DOL	****2959	KELC DEVELOPMENT, INC		7088 INTERSTATE ISLAND RD SYRACUSE NY 13209	03/31/2021	03/31/2026
DOL	DOL		KIMBERLY F. BAKER		7901 GEE ROAD CANASTOTA NY 13032	08/17/2021	08/17/2026
DOL	DOL	****3490	L & M CONSTRUCTION/DRYWALL INC.		1079 YONKERS AVE YONKERS NY 10704	08/07/2018	08/07/2023
DOL	DA	****8816	LAKE CONSTRUCTION AND DEVELOPMENT CORPORATION		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	DOL		LAVERN GLAVE		161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	AG	****3291	LINTECH ELECTRIC, INC.		3006 TILDEN AVE BROOKLYN NY 11226	02/16/2022	02/16/2027
DOL	DA	****4460	LONG ISLAND GLASS & STOREFRONTS, LLC		4 MANHASSET TRL RIDGE NY 11961	09/06/2018	09/06/2023
DOL	AG	****4216	LOTUS-C CORP.		81-06 34TH AVENUE APT. 6EJACKSON HEIGHTS NY 11372	02/07/2018	02/07/2023
DOL	DOL		LOUIS A. CALICCHIA		1223 PARK ST. PEEKSKILL NY 10566	05/17/2021	05/17/2026
DOL	NYC		LUBOMIR PETER SVOBODA		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	NYC		M & L STEEL & ORNAMENTAL IRON CORP.		27 HOUSMAN AVE STATEN ISLAND NY 10303	12/26/2019	12/26/2024
DOL	DOL	****2196	MAINSTREAM SPECIALTIES,		11 OLD TOWN RD	02/02/2021	02/02/2026

NYSDOL Bureau of Public Work Debarment List 10/21/2022

Article 8

DOL	DA		MANUEL P TOBIO		150 KINGS STREET BROOKLYN NY 14444	08/19/1998	08/19/2998
DOL	DA		MANUEL TOBIO		150 KINGS STREET BROOKLYN NY 11231	08/19/1998	08/19/2998
DOL	NYC		MAREK FABIJANOWSKI		50 MAIN ST WHITE PLAINS NY 10606	01/04/2019	01/04/2024
DOL	NYC		MARIA NUBILE		84-22 GRAND AVENUE ELMHURST NY 11373	03/10/2020	03/10/2025
DOL	DOL		MASONRY CONSTRUCTION, INC.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL	*****3333	MASONRY INDUSTRIES, INC.		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	NYC		MATINA KARAGIANNIS		97-18 50TH AVE CORONA NY 11368	04/19/2018	04/19/2023
DOL	DOL		MATTHEW P. KILGORE		4156 WILSON ROAD EAST TABERG NY 13471	03/26/2019	03/26/2024
DOL	DOL		MAURICE GAWENO		442 ARMONK RD MOUNT KISCO NY 10549	06/12/2018	06/12/2023
DOL	DOL		MICHAEL LENIHAN		1079 YONKERS AVE UNIT 4YONKERS NY 10704	08/07/2018	08/07/2023
DOL	AG		MICHAEL RIGLIETTI		31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	DOL	*****4829	MILESTONE ENVIRONMENTAL CORPORATION		704 GINESI DRIVE SUITE 29MORGANVILLE NJ 07751	04/10/2019	04/10/2024
DOL	NYC	*****9926	MILLENNIUM FIRE PROTECTION, LLC		325 W. 38TH STREET SUITE 204NEW YORK NY 10018	11/14/2019	11/14/2024
DOL	NYC	*****0627	MILLENNIUM FIRE SERVICES, LLC		14 NEW DROP LNE 2ND FLOORSTATEN ISLAND NY 10306	11/14/2019	11/14/2024
DOL	AG		MSR ELECTRICAL CONSTRUCTION CORP.		31 BAY ST BROOKLYN NY 11231	03/28/2018	03/28/2023
DOL	NYC		MUHAMMED A. HASHEM		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	NYC		NAMOW, INC.		84-22 GRAND AVENUE ELMHURST NY 11373	03/10/2020	03/10/2025
DOL	DA	*****9786	NATIONAL INSULATION & GC CORP		180 MILLER PLACE HICKSVILLE NY 11801	12/12/2018	12/12/2023
DOL	DOL	*****3684	NATIONAL LAWN SPRINKLERS, INC.		645 N BROADWAY WHITE PLAINS NY 10603	05/14/2018	05/14/2023
DOL	NYC		NAVIT SINGH		402 JERICHO TURNPIKE NEW HYDE PARK NY 11040	08/10/2022	08/10/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	03/01/2022	03/01/2027
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	09/29/2021	09/29/2026
DOL	DOL		NICHOLE E. FRASER A/K/A NICHOLE RACE		3469 STATE RT. 69 PERISH NY 13131	02/09/2022	02/09/2027
DOL	DOL	*****7429	NICOLAE I. BARBIR	BESTUCCO CONSTRUCTI ON, INC.	444 SCHANTZ ROAD ALLETOWN PA 18104	09/17/2020	09/17/2025
DOL	NYC	*****5643	NYC LINE CONTRACTORS, INC.		402 JERICHO TURNPIKE NEW HYDE PARK NY 11040	08/10/2022	08/10/2027
DOL	DOL	*****1845	OC ERECTERS, LLC A/K/A OC ERECTERS OF NY INC.		1207 SW 48TH TERRACE DEERFIELD BEACH FL 33442	01/16/2018	01/16/2023
DOL	DOL		PAULINE CHAHALES		935 S LAKE BLVD MAHOPAC NY 10541	03/02/2021	03/02/2026
DOL	DOL		PETER STEVENS		11 OLD TOWN ROAD SELKIRK NY 12158	02/02/2021	02/02/2026
DOL	DOL	*****0466	PRECISION BUILT FENCES, INC.		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	NYC		RASHEL CONSTRUCTION CORP		524 MCDONALD AVENUE BROOKLYN NY 11218	09/17/2020	09/17/2025
DOL	DOL	*****1068	RATH MECHANICAL CONTRACTORS, INC.		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	DOL	*****2633	RAW POWER ELECTRIC CORP.		3 PARK CIRCLE MIDDLETOWN NY 10940	01/30/2018	01/30/2023
DOL	DOL	*****2633	RAW POWER ELECTRIC CORP.		3 PARK CIRCLE MIDDLETOWN NY 10940	07/11/2022	07/11/2027
DOL	AG	*****7015	RCM PAINTING INC.		69-06 GRAND AVENUE 2ND FLOORMASPETH NY 11378	02/07/2018	02/07/2023
DOL	DA	*****7559	REGAL CONTRACTING INC.		24 WOODBINE AVE	10/01/2020	10/01/2025

NYSDOL Bureau of Public Work Debarment List 10/21/2022

Article 8

DOL	DOL		REGINALD WARREN		161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	DOL	*****9148	RICH T CONSTRUCTION		107 WILLOW WOOD LANE CAMILLUS NY 13031	11/13/2018	11/13/2023
DOL	DOL		RICHARD MACONE		8617 THIRD AVE BROOKLYN NY 11209	09/17/2018	09/17/2023
DOL	DOL		RICHARD REGGIO		1617 MAIN ST PEEKSKILL NY 10566	03/03/2020	03/03/2025
DOL	DOL	*****9148	RICHARD TIMIAN	RICH T CONSTRUCTI ON	108 LAMONT AVE SYRACUSE NY 13209	10/16/2018	10/16/2023
DOL	DOL		RICHARD TIMIAN JR.		108 LAMONT AVE SYRACUSE NY 13209	10/16/2018	10/16/2023
DOL	DOL		RICHARD TIMIAN JR.		108 LAMONT AVE SYRACUSE NY 13209	11/13/2018	11/13/2023
DOL	DOL		ROBBYE BISSESAR		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	01/11/2003	01/11/3003
DOL	DOL		ROBERT A. VALERINO		3841 LANYARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		ROBERT BRUNO		5 MORNINGSIDE DRIVE AUBURN NY 13021	05/28/2019	05/28/2024
DOL	DOL		RODERICK PUGH		404 OAK ST SUITE 101SYRACUSE NY 13203	07/23/2018	07/23/2023
DOL	DOL	*****4880	RODERICK PUGH CONSTRUCTION INC.		404 OAK ST SUITE 101SYRACUSE NY 13203	07/23/2018	07/23/2023
DOL	DOL		ROMEO WARREN		161 ROBYN RD MONROE NY 10950	01/30/2018	01/30/2023
DOL	DOL		ROMEO WARREN		161 ROBYN RD MONROE NY 10950	07/11/2022	07/11/2027
DOL	DOL		RONALD MESSEN		14B COMMERCIAL AVE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL		ROSEANNE CANTISANI			06/12/2018	06/12/2023
DOL	DOL	*****7172	RZ & AL INC.		198 RIDGE AVENUE VALLEY STREAM NY 11581	06/06/2022	06/06/2027
DOL	DOL	*****1365	S & L PAINTING, INC.		11 MOUNTAIN ROAD P.O BOX 408MONROE NY 10950	03/20/2019	03/20/2024
DOL	DOL	*****7730	S C MARTIN GROUP INC.		2404 DELAWARE AVE NIAGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL		SAL FRESINA MASONRY CONTRACTORS, INC.		1935 TEALL AVENUE SYRACUSE NY 13206	07/16/2021	07/16/2026
DOL	DOL		SAL MASONRY CONTRACTORS, INC.		(SEE COMMENTS) SYRACUSE NY 13202	07/16/2021	07/16/2026
DOL	DOL	*****9874	SALFREE ENTERPRISES INC		P.O BOX 14 2821 GARDNER RDPOMPEI NY 13138	07/16/2021	07/16/2026
DOL	DOL		SALVATORE A FRESINA A/K/A SAM FRESINA		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13218	07/16/2021	07/16/2026
DOL	DOL		SAM FRESINA		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13218	07/16/2021	07/16/2026
DOL	NYC	*****0349	SAM WATERPROOFING INC		168-42 88TH AVENUE APT.1 AJAMAICA NY 11432	11/20/2019	11/20/2024
DOL	NYC	*****1130	SCANA CONSTRUCTION CORP.		863 WASHINGTON STREET FRANKLIN SQUARE NY 11010	03/10/2020	03/10/2025
DOL	DOL	*****2045	SCOTT DUFFIE	DUFFIE'S ELECTRIC, INC.	P.O BOX 111 CORNWALL NY 12518	03/03/2020	03/03/2025
DOL	DOL		SCOTT DUFFIE		P.O BOX 111 CORNWALL NY 12518	03/03/2020	03/03/2025
DOL	NYC	*****6597	SHAIRA CONSTRUCTION CORP.		421 HUDSON STREET SUITE C5NEW YORK NY 10014	02/20/2019	02/20/2024
DOL	DOL	*****1961	SHANE BURDICK	CENTRAL TRAFFIC CONTROL, LLC.	2238 BAKER ROAD GILLET PA 16923	03/12/2018	03/12/2023
DOL	DOL		SHANE BURDICK		2238 BAKER ROAD GILLET PA 16923	03/12/2018	03/12/2023
DOL	DOL		SHANE NOLAN		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL		SHULEM LOWINGER		11 MOUNTAIN ROAD 28 VAN BUREN RD MONROE NY 10950	03/20/2019	03/20/2024

NYSDOL Bureau of Public Work Debarment List 10/21/2022

Article 8

DOL	DOL	****0816	SOLAR ARRAY SOLUTIONS, LLC		9365 WASHINGTON ST LOCKPORT IL 60441	07/23/2018	07/23/2023
DOL	DOL	****0440	SOLAR GUYS INC.		8970 MIKE GARCIA DR MANASSAS VA 20109	07/16/2021	07/16/2026
DOL	NYC		SOMATIE RAMSUNAHAI		115-46 132ND ST SOUTH OZONE PARK NY 11420	09/17/2020	09/17/2025
DOL	DOL	****2221	SOUTH BUFFALO ELECTRIC, INC.		1250 BROADWAY ST BUFFALO NY 14212	02/03/2020	02/03/2025
DOL	NYC	****3661	SPANIER BUILDING MAINTENANCE CORP		200 OAK DRIVE SYOSSET NY 11791	03/14/2022	03/14/2027
DOL	DOL		STANADOS KALOGELAS		485 RAFT AVENUE HOLBROOK NY 11741	10/19/2021	10/19/2026
DOL	DOL	****3496	STAR INTERNATIONAL INC		89-51 SPRINGFIELD BLVD QUEENS VILLAGE NY 11427	08/11/2003	08/11/3003
DOL	DOL	****6844	STEAM PLANT AND CHX SYSTEMS INC.		14B COMMERCIAL AVENUE ALBANY NY 12065	11/14/2019	11/14/2024
DOL	DOL	****9933	STEED GENERAL CONTRACTORS, INC.		1445 COMMERCE AVE BRONX NY 10461	05/30/2019	05/30/2024
DOL	DOL	****9528	STEEL-IT, LLC.		17613 SANTE FE LINE ROAD WAYNESFIELD OH 45896	07/16/2021	07/16/2026
DOL	DOL		STEFANOS PAPASTEFANOU, JR. A/K/A STEVE PAPASTEFANOU, JR.		256 WEST SADDLE RIVER RD UPPER SADDLE RIVER NJ 07458	05/30/2019	05/30/2024
DOL	DOL		STEVE TATE		415 FLAGER AVE #302STUART FL 34994	10/31/2018	10/31/2023
DOL	DOL		STEVEN MARTIN		2404 DELWARE AVE NIAGARA FALLS NY 14305	09/12/2018	09/12/2023
DOL	DOL	****3800	SUBURBAN RESTORATION CO. INC.		5-10 BANTA PLACE FAIR LAWN PLACE NJ 07410	03/29/2021	03/29/2026
DOL	DOL	****1060	SUNN ENTERPRISES GROUP, LLC		370 W. PLEASANTVIEW AVE SUITE 2.329HACKENSACK NJ 07601	02/11/2019	02/11/2024
DOL	DOL		SYED RAZA		198 RIDGE AVENUE NY 11581	06/06/2022	06/06/2027
DOL	DOL	****8209	SYRACUSE SCALES, INC.		158 SOLAR ST SYRACUSE NY 13204	01/07/2019	01/07/2024
DOL	DOL		TALAILA OCAMPA		1207 SW 48TH TERRACE DEERFIELD BEACH FL 33442	01/16/2018	01/16/2023
DOL	DOL		TERRY THOMPSON		11371 RIDGE RD WOLCOTT NY 14590	02/03/2020	02/03/2025
DOL	DOL	****9733	TERSAL CONSTRUCTION SERVICES INC		107 FACTORY AVE P.O BOX 11070SYRACUSE NY 13208	07/16/2021	07/16/2026
DOL	DOL		TERSAL CONTRACTORS, INC.		221 GARDNER RD P.O BOX 14POMPEI NY 13138	07/16/2021	07/16/2026
DOL	DOL		TERSAL DEVELOPMENT CORP.		1935 TEALL AVENUE SYRACUSE NY 13206	07/16/2021	07/16/2026
DOL	DOL		TEST		P.O BOX 123 ALBANY NY 12204	05/20/2020	05/20/2025
DOL	DOL	****6789	TEST1000		P.O BOX 123 ALBANY NY 12044	03/01/2021	03/01/2026
DOL	DOL	****5766	THE COKER CORPORATION	COKER CORPORATION	2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205	12/04/2018	12/04/2023
DOL	DOL	****5766	THE COKER CORPORATION	COKER CORPORATION	2610 SOUTH SALINA ST SUITE 14SYRACUSE NY 13205	09/17/2020	09/17/2025
DOL	DA	****4106	TRIPLE H CONCRETE CORP		2375 RAYNOR STREET RONKONKOMA NY 11779	08/04/2021	08/04/2026
DOL	DOL	****8210	UPSTATE CONCRETE & MASONRY CONTRACTING CO INC		449 WEST MOMBASHA ROAD MONROE NY 10950	06/06/2022	06/06/2027
DOL	DOL	****6392	V.M.K CORP.		8617 THIRD AVE BROOKLYN NY 11209	09/17/2018	09/17/2023
DOL	DOL	****6418	VALHALLA CONSTRUCTION, LLC.		796 PHELEPS ROAD FRANKLIN LAKES NJ 07417	12/01/2020	12/01/2025
DOL	NYC	****2426	VICKRAM MANGRU	VICK CONSTRUCTION	21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	NYC		VICKRAM MANGRU		21 DAREWOOD LANE VALLEY STREAM NY 11581	09/17/2020	09/17/2025
DOL	DOL		VICTOR ALICANTI		42-32 235TH ST DOUGLASTON NY 11363	01/14/2019	01/14/2024
DOL	NYC		VIKTAR PATONICH		2630 CROPEY AVE	10/30/2018	10/30/2023

NYSDOL Bureau of Public Work Debarment List 10/21/2022

Article 8

DOL	DOL		VIKTORIA RATH		24 ELDOR AVENUE NEW CITY NY 10956	02/03/2020	02/03/2025
DOL	NYC		VITO GARGANO		1535 RICHMOND AVE STATEN ISLAND NY 10314	12/13/2017	12/13/2022
DOL	NYC	*****3673	WALTERS AND WALTERS, INC.		465 EAST AND THIRD ST MT. VERNON NY 10550	09/09/2019	09/09/2024
DOL	DOL	*****3296	WESTERN NEW YORK CONTRACTORS, INC.		3841 LAYNARD COURT NEW PORT RICHEY FL 34652	07/09/2019	07/09/2024
DOL	DOL		WHITE PLAINS CARPENTRY CORP		442 ARMONK RD	06/12/2018	06/12/2023
DOL	DOL		WILLIAM G. PROERFRIEDT		85 SPRUCEWOOD ROAD WEST BABYLON NY 11704	01/19/2021	01/19/2026
DOL	DOL	*****5924	WILLIAM G. PROPHY, LLC	WGP CONTRACTIN G, INC.	54 PENTAQUIT AVE BAYSHORE NY 11706	01/19/2021	01/19/2026
DOL	DOL	*****4043	WINDSHIELD INSTALLATION NETWORK, INC.		200 LATTA BROOK PARK HORSEHEADS NY 14845	03/08/2018	03/08/2023
DOL	DOL	*****4730	XGD SYSTEMS, LLC	TDI GOLF	415 GLAGE AVE #302STUART FL 34994	10/31/2018	10/31/2023

TECHNICAL SPECIFICATIONS

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering

DOMESTIC WATER LINE IMPROVEMENTS
WESTCHESTER COUNTY AIRPORT

CONTRACT 22-522

TECHNICAL SPECIFICATIONS AND APPENDICES
TABLE OF CONTENTS

DIVISION 1 – GENERAL REQUIREMENTS

01 11 00	SUMMARY OF WORK
01 19 00	MISCELLANEOUS PROVISIONS
01 20 00	PRICE AND PAYMENT PROCEDURES
01 32 00	CONSTRUCTION SCHEDULE
01 32 33	PHOTOGRAPHIC DOCUMENTATION
01 33 00	SUBMITTAL PROCEDURES
01 35 29	HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES
01 45 00	QUALITY CONTROL
01 55 26	TRAFFIC CONTROL
01 57 19	TEMPORARY ENVIRONMENTAL CONTROLS
01 60 00	PRODUCT REQUIREMENTS
01 71 23	FIELD ENGINEERING
01 73 29	CUTTING AND PATCHING
01 74 00	CLEANING AND WASTE MANAGEMENT
01 77 00	CLOSEOUT PROCEDURES
01 78 39	PROJECT RECORD DOCUMENTS

DIVISION 2 – EXISTING CONDITIONS

02 32 19	EXPLORATORY EXCAVATIONS (TEST PITS)
02 33 13	UNDERGROUND UTILITY LOCATOR SERVICE
02 40 00	DEMOLITION, REMOVALS AND MODIFICATIONS
02 80 00	WASTE TRANSPORTATION AND DISPOSAL

DIVISION 3 – CONCRETE

03 11 00	CONCRETE FORMWORK
03 20 00	CONCRETE REINFORCING
03 30 00	CAST-IN-PLACE CONCRETE
03 34 00	CONTROLLED LOW STRENGTH MATERIAL
03 60 00	GROUTING

DIVISION 4 – MASONRY

04 05 13	MORTAR
04 15 00	MASONRY ACCESSORIES
04 20 10	UNIT MASONRY CONSTRUCTION
04 22 00	CONCRETE UNIT MASONRY

DIVISION 5 – METALS

05 50 30	ANCHOR BOLTS, EXPANSION ANCHORS AND CONCRETE INSERTS
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DOMESTIC WATER LINE IMPROVEMENTS
WESTCHESTER COUNTY AIRPORT

CONTRACT 22-522

TABLE OF CONTENTS (CONTINUED)

DIVISION 6 - WOOD AND PLASTICS

06 10 00 ROUGH CARPENTRY

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

07 21 00 INSULATION
07 26 13 VAPOR RETARDER UNDER SLABS ON GRADE
07 28 00 WATER RESISTIVE BARRIER AND AIR BARRIER
07 40 00 ALUMINUM SOFFITS, FASCIAS AND WALL PANELS
07 41 10 ALUMINUM ROOF PANELS
07 71 00 MANUFACTURED ROOF SPECIALTIES
07 92 00 JOINT SEALANTS

DIVISION 8 – DOORS AND WINDOWS

08 11 13 HOLLOW METAL DOORS AND FRAMES
08 36 80 OVERHEAD ROLLING DOORS
08 71 00 DOOR HARDWARE
08 90 00 LOUVERS AND VENTS

DIVISION 9 – FINISHES

09 29 00 CEMENT BOARD
09 67 23 RESINOUS FLOORING
09 90 00 PAINTING

DIVISION 10 – SPECIALTIES

10 14 23 PANEL SIGNAGE
10 44 16 PORTABLE FIRE PROTECTION EQUIPMENT

DIVISION 22 – PLUMBING

22 05 00 COMMON WORK RESULTS FOR PLUMBING
22 05 17 SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING
22 05 18 ESCUTCHEONS FOR PLUMBING PIPING
22 05 19 METERS AND GAGES FOR PLUMBING PIPING
22 05 23 GENERAL-DUTY VALVES FOR PLUMBING PIPING
22 05 29 HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
22 05 53 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
22 07 19 PLUMBING PIPING INSULATION
22 11 16 DOMESTIC WATER PIPING
22 11 19 DOMESTIC WATER PIPING SPECIALTIES
22 13 16 SANITARY WASTE AND VENT PIPING
22 13 19 SANITARY WASTE PIPING SPECIALTIES

DOMESTIC WATER LINE IMPROVEMENTS
WESTCHESTER COUNTY AIRPORT

CONTRACT 22-522

TABLE OF CONTENTS (CONTINUED)

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

23 05 00	COMMON WORK RESULTS FOR HVAC
23 05 13	COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT
23 05 29	HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
23 05 53	IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT
23 82 39.16	PROPELLER UNIT HEATERS

DIVISION 26 – ELECTRICAL

26 05 19	LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 05 26	GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 05 29	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS
26 05 33	RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
26 05 43	UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS
26 05 44	SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING
26 05 53	IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 09 23	LIGHTING CONTROL DEVICES
26 22 13	LOW-VOLTAGE DISTRIBUTION TRANSFORMERS
26 24 16	PANELBOARDS
26 27 26	WIRING DEVICES
26 28 13	FUSES
26 28 16	ENCLOSED SWITCHES AND CIRCUIT BREAKERS
26 51 19	LED INTERIOR LIGHTING
26 52 19	EMERGENCY AND EXIT LIGHTING
26 56 19	LED EXTERIOR LIGHTING

DIVISION 31 – EARTHWORK

31 00 00	EARTHWORK
31 05 16	AGGREGATES FOR EARTHWORK
31 10 00	DEMOLITION AND SITE CLEARING
31 23 16.26	ROCK REMOVAL
31 23 33	TRENCHING AND BACKFILLING
31 25 00	SOIL EROSION AND SEDIMENT CONTROL
31 25 13	EROSION CONTROL MATERIALS
31 40 00	SHORING AND UNTERPINING

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 12 16	ASPHALT PAVEMENTS
32 31 13	CHAIN LINK FENCING
32 92 00	GRASS RESTORATION

DOMESTIC WATER LINE IMPROVEMENTS
WESTCHESTER COUNTY AIRPORT

CONTRACT 22-522

TABLE OF CONTENTS (CONTINUED)

DIVISION 33 – UTILITIES

33 05 05	BURIED PIPING INSTALLATION
33 05 19	DUCTILE IRON WATER UTILITY DISTRIBUTION PIPING
33 12 16	WATER UTILITY DISTRIBUTION VALVES
33 12 17	INSERTION VALVE (LIVE SHUT DOWN)
33 12 19	WATER UTILITY DISTRIBUTION FIRE HYDRANTS
33 13 00	DISINFECTION OF WATER UTILITY DISTRIBUTION PIPING
33 14 17	SITE WATER UTILITY SERVICES

APPENDICES

APPENDIX 1	– GEOTECHNICAL REPORT
APPENDIX 2	– SOIL SAMPLE AND GROUNDWATER ANALYSIS
APPENDIX 3	– WATERLINE SOIL AND GROUNDWATER ASSESSMENT
APPENDIX 4	– NYS DEC WORKPLAN & FIGURES
APPENDIX 5	– STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
APPENDIX 6	– LIMITED HAZARDOUS MATERIALS ASSESSMENT
APPENDIX 7	– WESTCHESTER COUNTY DEPARTMENT OF HEALTH (DOH) APPROVAL LETTERS

NO TEXT ON THIS PAGE

SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. The Work to be performed under this Contract and in accordance with these Specifications consists of, but is not limited to, furnishing of all equipment, superintendents, labor, skill, material and all other items necessary for the project. The Contractor shall perform all Work required for such construction in accordance with the Contract Documents and subject to the terms and conditions of the Contract, complete and ready for use.

- B. The Contract consists of Base Bid Items A through H. The principal features of the Base Bid Items to be performed include but are not limited to:
 - 1. Bid Item A - General Construction
 - a. Location of existing utilities (Contractor shall retain an independent contractor to assist in locating all on-site utilities associated with the work)
 - b. Installation of erosion control measures
 - c. Tree removal and site clearing
 - d. Removal and storage of items to be rehabilitated/reused
 - e. Perform test pits as shown and specified or as ordered by the Engineer
 - f. Disconnection or removal of utilities, piping, ductwork, etc.
 - g. Installation of new watermain piping and appurtenances, etc.
 - h. Installation of improvements to the existing watermain
 - i. Construction of new backflow preventer buildings at Tower Road and Airport Road
 - j. Demolition of the existing backflow prevention building
 - k. Construction of new PRV/Water meter vault along Airport Road
 - l. Disinfection and pressure testing of new and existing watermain piping Provision of select fill or removal and disposal of suitable material, as needed to construct and install the proposed work

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- m. Final site restoration and seeding
 - n. Final as-built survey.
2. Bid Item B – Additional 12” Diameter Water Main Pipe, furnished and installed
 3. Bid Item C – Additional 12” Gate Valve, furnished and installed
 4. Bid Item D – Additional Fire Hydrant, furnished and installed
 5. Bid Item E – Additional Ductile Iron Water Main Fittings, furnished and installed
 6. Bid Item F – Rock Removal and Disposal
 7. Bid Item G – Exploratory Excavations (Test Pits)
 8. Bid Item H – Insertion Valve (Live Shut Down) – 12” furnished and installed

1.2 GENERAL

- A. The Instructions for Bidders, General Conditions and Division 1 of the Technical Specifications, shall apply equally to all Work under the Contract for this Project.
- B. Where the words "Contract" and "Contractor" are used in Sections of Division 1, they shall apply equally to all parties entering into agreements with the Owner to perform Work specified herein and to all Contracts derived from said agreements.
- C. Where the word “Owner” is used in these Specifications, it shall refer to the Westchester County Department of Public Works and Transportation.

1.3 CONTRACT DOCUMENTS

- A. The Work to be done is shown on the set of Contract Drawings entitled Domestic Water Line Improvements, Westchester County Airport, Towns of Harrison and North Castle, New York.

1.4 GENERAL ARRANGEMENT

- A. The Contract Drawings indicate the extent and general arrangement of the Work. The specific equipment proposed for use by the Contractor on the Project may require changes in the construction detailed on the Contract Drawings, and all such changes shall be performed in accordance with the requirements of the Contract Documents and shall be made without additional cost to the Owner and shall include the increase in costs of the other Contracts.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

1.5 TIME OF WORK

- A. Overtime work shall conform to the requirements of Division 1, Supplementary Conditions, shall be considered as normal procedure under this Contract, and the Contractor shall make no claims for extra compensation as a result thereof.

- B. Unless otherwise specifically permitted, all work that would be subject to damage shall be stopped during inclement, stormy or freezing weather. Only such work as will not suffer injury to workmanship or materials will be permitted. The Contractor shall carefully protect his Work against damage or injury from the weather, and when work is permitted during freezing weather shall provide and maintain approved facilities for heating the materials and for protecting the finished Work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 01 19 00

MISCELLANEOUS PROVISIONS

PART 1 - GENERAL

1.1 PROVISIONS DEEMED INSERTED

- A. Each and every provision required by law to be inserted in the Contract Documents shall be read and enforced as though it were included herein and in the event any such provision is not inserted, or is not correctly inserted, then, upon the application of either party, the Contract Documents shall forth with be physically amended to make insertion or correction.

1.2 RIGHT TO USE WORK

- A. The Owner may enter upon and use the whole or any portion of the work which may be in condition to use at any time previous to its final acceptance by the Owner. Such use shall not constitute or be evidence of acceptance by the Owner or Engineer of the whole or any part of the material furnished or work performed under the Contract.

1.3 PATTERN OF WORK

- A. The Contractor is directed to work in such a manner so as to minimize the impact of the construction work on the operations of the Westchester County Airport.

1.4 APPROVED EQUIVALENT ARTICLES, MATERIALS AND EQUIPMENT

- A. It is the intent of the specifications to describe definitively and fully the character of materials and workmanship furnished, and to require first class work and materials in all particulars. The terms "equal" or "approved equal", as used in these specifications shall mean approved by the Engineer in writing.

1.5 PENAL CODE

- A. Section 1918 of the Penal Law, as amended, provides that no person shall discharge explosives in the ground, nor shall any person other than a state or county employee regularly engaged in the maintenance and repair thereof, excavate in any existing street, highway, or public place, unless notice thereof in writing shall have been given at least 72 hours in advance to the person, corporation or municipality engaged in the distribution of gas in such territory. The person having direction or control of such work shall give such notice and further he shall ascertain whether there is within 100 feet in such street, highway or public place, or in case of a proposed discharge of explosive within a radius of 200 feet of such discharge, any pipe of any other person, corporation or

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

municipality conveying combustible gas, and if there be such pipe he shall also give such notice to any such person, corporation or municipality. Provided, however, that in any emergency involving danger to life, health or property it shall be lawful to excavate without using explosives if the notices prescribed herein are given as soon as reasonably possible, and to discharge explosives to protect a person or persons from an immediate and substantial danger of death or serious personal injury if such notices are given before any such discharge is undertaken.

- B. Any such work shall be performed in such manner as to avoid damage to any pipe conveying combustible gas. Any violation of the provisions of this Section shall be a misdemeanor.

1.6 COMPRESSED GAS

- A. Where compressed gas of any type is used for any purpose, it shall be contained in cylinders complying with ICC regulations as to manufacturing, filling, marking, testing, tagging, valving and shipping. Gases of different types shall not be stored together except when in use and when such proximity is required.
- B. All gas cylinders shall be stored in sheds constructed of non-combustible materials. Sheds shall be well ventilated and without electric lights or fixtures and shall be located as far from other buildings as is practicable. All gas cylinders not in actual use, or in proposed immediate use, shall be removed from the building under construction or reconstruction. Empty gas cylinders shall be removed prior to bringing in a replacement cylinder. Cylinders shall at all times be supported and braced in an upright position. When not in use the protective cap shall be screwed over the valve.
- C. All persons required to handle gas cylinders or to act as temporary firemen (firewatchers) shall be able to read, write and understand the English language; they shall be also be required by the Contractor to read Part 3 of Pamphlet P-1 "Safe Handling of Compressed Gases" published by the Compressed Gas Association, 500 Fifth Avenue, New York, NY 11036, and available to the Contractor for 50 cents per copy.
- D. Where L-P Gas is required for Temporary Heat (including Construction Heat), the number of cylinders within the structure or building shall be limited to the least amount required, in general, one cylinder per heater. Cylinders and heaters shall be connected with two braid neoprene hose fitted at each end with threaded unions and capable of withstanding a pressure of 250 psi. The length of hose shall not exceed 30 feet and shall be protected from mechanical injury, kinking and abrasion. Heaters shall be not less than 6 feet from any cylinder and not less than 10 feet from any tarpaulin or other type of closure. All tarpaulins and other type closures shall be secured so as not to be blown loose. All debris and rubbish shall be removed as directed to prevent fire hazards.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- E. Where local ordinances are in effect regarding gas cylinders,(their use, storage, appurtenances, and handling), such ordinances shall supplement the requirements of this specification.
- F. L-P gas heating will not be permitted in enclosed area below grade.
- G. Any cylinder not having the proper ICC markings or reinspection marking, or any cylinder which, in the opinion of the Engineer, fails to meet the requirements of the “Standards for Visual Inspection of Compressed Gas Cylinders” of the Compressed Gas Association, Inc., shall be returned to the supplier. Any cylinder which develops a leak shall be isolated immediately away from any building and the supplier shall be immediately notified; such other precautions as may be required to prevent damage or injury shall also be taken by the Contractor.

1.7 LEAVES AND SNOW REMOVAL

- A. The Contractor shall remove leaves and snow during construction as required and as often as required to complete his work.

1.8 QUANTITIES

- A. The total quantities of bid items are estimated only and actual quantities may be much greater or much less than those indicated.
- B. The estimated quantities for all items may be subject to significant change due to budget constraints and/or field conditions at the time of construction. No additional compensation to the Contractor will be allowed for changes in the scope, extent or quantities of the work. For this and other reasons, unbalanced bids may be rejected if it is deemed to be in the best interest of the Owner to do so.

1.9 UNIT PRICES

- A. Unit prices are deemed to be all inclusive of the necessary cost to complete the work and, unless specific authorization in writing from the Owner is received by the Contractor, no additional payment for extra items of work will be made. The determination of the Owner in this regard shall be final and binding.

1.10 CONTRACTOR SHALL NOT USE OWNER’S EQUIPMENT, TOOLS AND MANPOWER

- A. The Contractor shall not be allowed to use Owner’s tools, equipment and manpower in order to perform the work included in this Contract.

1.11 RESTORATION OF THE PREMISES

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- A. The Contractor shall be responsible for restoration of all damage to buildings, equipment, roadways, sidewalks, plantings, lawn and other physical features damaged through his operations. All damaged items shall be restored to their previous conditions at no additional cost to the Owner.

1.12 CONCRETE DEMOLITION AND REMOVAL

- A. The method used for the demolition and removal of concrete will be subject to the approval of the Owner. The use of a ball operated from a crane will not be allowed. The use of a clamshell bucket for the removal of sidewalks, driveway aprons and curbs will not be allowed. All methods used must be such that the exact limits of the item to be removed can be accurately controlled. All work damaged or removed beyond the payment limit lines shall be restored at the Contractor's own expense, except where authorized by the Owner in writing. All broken concrete shall be removed from within the contract limits the same day that it is demolished.

1.13 MATERIAL DELIVERY TICKETS

- A. All deliveries of materials to the job site shall be accompanied by an extra copy of the material delivery ticket, which shall be given to the Engineer as his copy. Refusal to provide such delivery ticket to the Engineer may result in rejection of the materials.

1.14 EMERGENCY TELEPHONE NUMBERS

- A. In order to facilitate the contacting of Contractor's personnel in the event of emergency calls during those hours other than normal working hours, the following will be required:
 - 1. Prior to the commencement of any work under this contract, the Contractor shall submit to the Owner the names of three (3) persons having authority to act for the Contractor along with their respective telephone numbers (office, home, beeper, cell phone, fax, etc.).

1.15 PROCEDURES

- A. The Contractor shall temporarily fence all unattended excavations over 2 feet in depth with properly supported snow fence having a minimum height of 4 feet.
- B. The drawings and specifications do not include all the necessary components for construction safety. It is the Contractor's responsibility to provide all construction safety measures at his own expense where not included as an integral part of a pay item.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- C. The safety provisions in the specification are primarily to protect the Owner's property and the public against unsafe acts of the Contractor. The Occupational Safety and Health Act of 1970 requires that the employer... (1) shall furnish to each of his employees employment and place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees; (2) shall comply with the Occupational Safety and Health Standards promulgated under this Act.... The regulations in the Act may be more stringent than are required by the plans and/or specifications. The Contractor, however, must conform to the OSHA regulations and such conformance shall not be reason to demand additional payment or claim extra work. Sheeting shall conform strictly to the requirements of the OSHA regulations for Construction Subpart C, Excavation, Trenching and Shoring; 1926.650 General Protection Requirements; 1926.651 Specific Excavation Requirements; 1926.652 Specific Trenching Requirements; 1926.653 Definitions Applicable to this Subpart.
- D. All work performed under this Contract shall comply with the requirements of the Industrial Code of the State of New York, Rule No. 23 and Rule No. 53, both as currently amended.

1.16 ACCESS TO PRIVATE PROPERTY

- A. The Contractor shall at all times maintain access to all buildings in the area of the work.

1.17 ACCURACY OF PLANS AND SPECIFICATIONS

- A. The detail plans and specifications for this Contract have been prepared with care and are intended to show as clearly as is practicable the work required to be done. The Contractor must realize, however, that the construction details cannot always be accurately anticipated and that in executing this work, field conditions may require reasonable modifications in the details of plans and quantities of work involved. Work under all items in the Contract must be carried out to meet these field conditions to the satisfaction of the Owner and in accordance with his instructions and the Contract specifications.

1.18 USE OF MUNICIPAL WATER SUPPLY

- A. The Contractor shall obtain and pay for all permits necessary for the use of municipal water supplies on the project.
- B. Water tank trucks used on the project for any purpose shall conform in all respects to the requirements of the New York State Sanitary Code which includes requirements for an "Air Gap" backflow prevention device in the filling system.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- C. All connections to hydrants for construction purposes where permitted, shall be equipped with a backflow prevention device meeting the approval of the local water district or other governing authority.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The items listed below beginning with Article 1.4, refer to and are the same pay items listed in the Itemized Proposal. They constitute all the pay items for the completion of the Work. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, plant services, layout surveys, job signs, sanitary requirements, testing, reparation of damages produced by Contractor, safety devices, approval and Record Drawings, water supplies, power, maintaining traffic, removal of waste, watchmen, Bonds, insurance, and all other requirements of the Contract, General and Supplementary Conditions. Compensation for all such services, things and materials shall be included in the price stipulated for the lump sum listed herein.

1.2 ESTIMATE OF QUANTITIES

- A. The estimated quantities for unit bid prices, as listed in the Itemized Proposal, are approximate only and are included solely for the purpose of comparison of Bids. The Owner does not expressly or by implication agree that the nature of the materials encountered below the surface of the ground or the actual quantities of material encountered or required will correspond therewith and reserves the right to increase or decrease any quantity or to eliminate any quantity as the Owner may deem necessary. Any allowance for a change in the unit price shall apply only to that portion of work in excess of 125% of the original contract item quantity, or to the actual amount of work performed if the quantity decreases below 75% of the original contract item quantity. The Contractor or the County, as the case may be, must make written notice to the other party of the change in the quantity of a major item if that party wishes to adjust the contract price or time of performance. Knowledge of a change in quantity could result from receipt of a change order (approved or unapproved), a letter directing a change in the contract work, review of plan details and estimates, review of work completed or progress payment quantities, or a combination of the above.

1.3 RELATED PROVISIONS SPECIFIED ELSEWHERE

- A. Payments to Contractor: Refer to Contract, General Conditions and Supplementary Conditions.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

1.4 BID PROPOSAL ITEMS

- A. Bid Item A – Domestic Water Line Improvements, Westchester County Airport General Construction
1. Payment for Bid Item A will be the lump sum bid under this item and will be full compensation for furnishing all labor, equipment and materials as shown on the Contract Drawings and as specified, unless otherwise included under other bid items.
 2. The work under this item includes but is not limited to all work delineated in Section 01 11 00, Summary of Work.
- B. Bid Item B - Additional 12” Diameter Watermain Pipe, furnished and installed
1. Measurement and payment for Bid Item B will be made only for the quantity of additional 12” Diameter Watermain Pipe, furnished and installed above and beyond what’s shown on the Contract Drawings, as ordered in writing by the Engineer.
 2. Measurement shall be in linear foot measured in the field based on the payment limits shown in the Contract Drawings and approved by the Engineer.
 3. The price bid per linear foot for Additional 12” Diameter Watermain Pipe, furnished and installed shall include the furnishing of all labor, tools, equipment, backfilling, compaction, testing and essentials necessary to complete the work specified.
- C. Bid Item C - Additional 12” Gate Valve, furnished and installed
1. Measurement and payment for Bid Item C will be made only for the quantity of Additional 12” Gate Valve, furnished and installed above and beyond what’s shown on the Contract Drawings, as ordered in writing by the Engineer.
 2. Measurement shall be each measured in the field based on the payment limits shown in the Contract Drawings and approved by the Engineer.
 3. The price bid for each Additional 12” Gate Valve, furnished and installed shall include the furnishing of all labor, tools, equipment, backfilling, compaction, testing and essentials necessary to complete the work specified.
- D. Bid Item D - Additional Fire Hydrant, furnished and installed
1. Measurement and payment for Bid Item D will be made only for the quantity of Additional Fire Hydrants furnished and installed above and beyond what’s shown on the Contract Drawings, as ordered in writing by the Engineer.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

2. Measurement shall be each measured in the field based on the payment limits shown in the Contract Drawings and approved by the Engineer.
 3. The price bid for each Additional Fire Hydrant, furnished and installed shall include the furnishing of all labor, tools, equipment, backfilling, compaction, testing and essentials necessary to complete the work specified.
- E. Bid Item E - Additional Ductile Iron Watermain Fittings, furnished and installed
1. Measurement and payment for Bid Item E will be made only for the quantity of Additional Ductile Iron Watermain Fittings furnished and installed above and beyond what's shown on the Contract Drawings, as ordered in writing by the Engineer.
 2. Measurement shall be in pounds measured in the field based on the payment limits shown in the Contract Drawings and approved by the Engineer.
 3. The price bid for Additional Ductile Iron Watermain Fittings, furnished and installed shall include the furnishing of all labor, tools, equipment, backfilling, compaction, testing and essentials necessary to complete the work specified.
- F. Bid Item F - Rock Removal and Disposal
1. Measurement and payment for Bid Item F will be made only for the quantity of rock encountered and required to be removed and disposed of in order to install the proposed work. Refer to specification section 31 23 16.26.
 2. Measurement shall be in cubic yards measured in the excavation based on the payment limits shown in the Contract Drawings or approved by the Engineer.
 3. The price bid per cubic yard for Rock Removal and Disposal shall include the furnishing of all labor, tools, equipment and essentials necessary to complete the work specified including transportation to and disposal costs at an approved disposal facility.
- G. Bid Item G – Exploratory Excavations (Test Pits)
1. Measurement and payment for Bid Item G will be made only for the quantity of Exploratory Excavations performed by the contractor, as ordered in writing by the Engineer. Refer to specification section 02 32 19. Measurement shall be in cubic yards measured in the excavation.
 2. The price bid per cubic yard for Exploratory Excavations shall include the furnishing of all labor, tools, equipment, samples, tests and essentials necessary to excavate and backfill price will include hand excavation, as necessary.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

H. Bid Item H – Insertion Valve (Live Shut-Down) – 12”, furnished and installed

1. Measurement and payment for Bid Item H will be made for the quantity of EACH Insertion Valve furnished and installed, as ordered in writing by the Engineer. Refer to specification section 33 12 16.
2. Measurement shall be for EACH insertion valve furnished and installed as measured by the Engineer.
3. The price bid for EACH Insertion Valve shall include the furnishing of all labor, tools, equipment, samples, tests and essentials necessary to excavate, install, backfill and properly compact as ordered by the Engineer.

I. Bid Item I – Groundwater Treatment and Disposal

1. Measurement and payment for Bid Item I will be lump sum bid under this item and will be full compensation for furnishing all labor, equipment, and materials necessary for the treatment and disposal of groundwater removed, for the purpose of constructing the work shown on the Contract Drawings and as specified. The cost of this item is delineated on the Proposal Sheet and shall be included in the total amount bid for the project.

J. Bid Item J – Contract Bonds and Insurance

1. This item provides payment for Contract Bonds and Insurances which must not exceed 3% of the subtotal of Bid Items A through H.
2. The lump sum price bid for this Item shall include all preparation effort required to complete the work.

K. Bid Item W-800 – Miscellaneous Work Allowance

1. This item provides for miscellaneous additional work to be accomplished as ordered by the Owner. The cost of this item is delineated on the Proposal Sheet and shall be included in the total amount bid for the project.
2. The basis for payment under this Allowance will be that amount substantiated by invoices from the supplier of equipment, materials or services selected and ordered in writing by the Owner plus Contractor's overhead and profit as defined in the General Clauses.
3. It is understood that should additional work i.e., equipment, materials, and/or services, be ordered by the Owner during the performance of the specified Contract, the cost for this additional work will be paid for under the dollar allowance included in the bid. Should no additional work be ordered by the Owner or if the value of the ordered additional work is less than the total dollar amount of the allowance included in the bid (as noted on the Bid Sheet) then the total final Contract amount (total dollar amount

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

due Contractor) will be reduced by the dollar amount of allowance unused. Any work ordered above this allowable dollar amount will be paid in accordance with the General Conditions.

L. Bid Item W-851 – Testing of Materials and Field Testing Equipment

1. This item provides for Testing of Materials and Field Testing Equipment per Article “Testing of Materials and Field Testing Equipment (Item W-851)” of General Requirements, as ordered by the Owner. The cost of this item is delineated on the Proposal Sheet and shall be included in the total amount bid for the project.

1.5 DAMAGES BY CONTRACTOR

- A. No payments shall be made for reparation of damages caused by Contractor.

1.6 CONTRACTOR PAY REQUISITIONS

- A. The Contractors shall submit monthly payment requisitions, prepared as directed by the Engineer. A maximum of one payment requisition shall be submitted each month.
- B. The Contractor may, at the approval of the Engineer, submit payment for unit cost items based upon agreed upon estimated amounts each month prior to completion of as built surveys.

++ END OF SECTION ++

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SECTION 01 32 00

CONSTRUCTION SCHEDULE

PART 1 - GENERAL

1.1 GENERAL

- A. Contractor shall prepare the project construction schedule to include all required activities.
- B. The Contractor shall conform to the following sequence of events, as applicable, to prepare the project construction schedule.
 - 1. The Contractor prepares his preliminary schedule and submits same to the Engineer within 15 days after date of the Notice to Proceed.
 - 2. The Contractor revises preliminary schedule to reflect input of the Engineer and submits same back to the Engineer no later than 15 days after the receipt of input of the Engineer.
 - 3. The Contractor maintains the schedule and updates the schedule as specified herein.
- C. The construction schedule shall be prepared in accordance with the following requirements:
 - 1. Content – Supply the following information on the Construction Schedule:
 - a. Shop drawing submittal dates and required approval dates.
 - b. Product and equipment delivery dates.
 - c. Factory and field testing dates.
 - d. Dates for beginning and completing each phase of the work by activity and by trades.
 - 2. Format
 - a. Type – Horizontal bar chart.
 - b. Sheet Size – 24 inches by 36 inches.
 - c. Time Scale – Indicate first date in each work week.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- d. Activity Designations – Show title and related specification section number.
3. Organization
 - a. Group shop drawing submittal and reviews into separate subschedule.
 - b. Group product deliveries into a separate subschedule.
 - c. Group construction work into a separate subschedule by activity.
 - d. Group critical activities which dictate the rate of progress into a separate subschedule.
 - e. Organize each subschedule by Specification Section number.
 4. Coordination
 - a. To assure completion of the Work within the established time of completion, all activities of the Contractor will be scheduled and monitored by use of the Official Project Schedule.
 - b. In the preparation of the construction schedule, the Contractor shall take into consideration shop drawing submittal and approval time, the delivery time of equipment and materials, subcontractors work, availability and abilities of workmen, weather conditions, and restrictions in operations at the Project site, and all other items that may affect completion of the Work within the time requirements of the Contract Documents.
- D. Schedule Updating
1. Weekly Progress – The Contractor shall submit a weekly progress report to the Engineer. The weekly reports shall include manpower and work activities. The Contractor will include a copy of the portion of the Official Project Schedule relating to the activities involved during that week. This information will be used as a checklist on which the Contractor and their subcontractors will indicate start and finish dates for all activities as well as percentage of completion. In addition, the Contractor will indicate which activities they plan to start the following week.
 2. Construction Schedule Update – The Contractor shall submit monthly updates of the Schedule. The updates shall be reviewed at monthly update meetings (or lesser intervals if deemed necessary). Monthly updates shall indicate the following:

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- a. Approved changes in activity sequencing.
- b. Changes in activity durations for unstarted or partially complete activities where agreed upon.
- c. The effect of any delays to any activities in progress and/or the impact of known delays which are expected to affect future work.
- d. The effect of Contractor Modifications on activity duration.
- e. Changes to activity logic, where agreed upon, to reflect revision in the Contractor's plan, i.e., changes in activity duration, and activity sequence for the purpose of regaining lost time or improving progress.
- f. Changes to milestones, due dates and the overall Contract Completion Date, which have been agreed upon by the Owner since the last revision of the Schedule.

The schedule shall accurately reflect the manner in which the Contractor intends to proceed with the project and shall incorporate the impact of all delays and Change Orders as soon as these factors can be defined. All changes made to the schedule shall be subject to approval by the Owner prior to inclusion in the Schedule. When the Owner and the Contractor are unable to agree as to the amount of time to be allowed for Change Order work, or the manner in which this work is to be reflected, this shall reflect the logic and time durations furnished by the Contractor for the Change Order pending final Owner decision. If unapproved Contractor logic and time durations are used, the Contractor agrees that any time which is projected to be lost on the project as a result of these schedule changes will be considered the responsibility of the Contractor until a final agreement has been made or a final decision rendered by the Owner regarding the manner in which the Change Order work is to be reflected on the Schedule. When this final decision has been made by the Owner, the Schedule shall be revised in accordance with such decision and issue a final analysis of the effect of the change on the project.

If the Contractor desires to revise the logic of the approved Schedule so as to reflect a sequence of construction which differs from that originally agreed to, he must first obtain approval of the Owner. If this change extends the completion date of the project or delays work, the Contractor agrees that that these impacts and all associated cost will be considered a claim to be assessed against the Contractor initiating the change and will not be the basis for a project time extension. The change will not be used as a basis of a claim against the Owner.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

Once each month, at the same time the schedule is updated, the Owner and the Contractor shall jointly make entries to identify those activities stated by date and those completed by date during the previous period, to show estimated time required to complete each activity started but not yet completed, to show activity percent completed and to reflect any changes in the schedule approved in accordance with the preceding paragraph. After completion of the joint review, an updated schedule will be generated by the Contractor.

- E. Time Extensions – The Engineer will issue time extensions, subject to the approval of the Owner, as may be necessary whenever delays occur which satisfy the requirements of the Contract and which effect critical work sequences or which have such an impact that the delay exceeds the available float.

Time extensions will not be granted unless substantiated by the schedule and then not until the project contingency becomes zero.

The contract completion time or times will be adjusted only for causes specified in this Contract. In the event a Contractor requests an extension of any Contract Completion Date, he shall furnish such justification and supporting evidence that the Engineer requires to evaluate the finding of fact and advise the Contractor in writing thereof. If the Engineer finds that the Contractor is entitled to any extension of any Contract Completion Date under the provisions of this Contract, the determination as to the total number of days extension shall be based upon the currently approved schedule and on all data relevant to the extension. Such data will be included in the next updating of the schedule.

A total project time extension may be issued if delays which are determined to be beyond the control of the Contractor affect the main project critical path shown on the Schedule, thereby directly extending the final project completion date.

Contractor shall acknowledge and agree that the evaluation of project delays and determinations regarding project time extension will be based upon the project Schedule and the following criteria:

1. Float time shown on the Schedule is not for the exclusive use of either the Contractor or the Engineer. It is agreed that float time is available for use by all parties to facilitate the effective use of available resources and to minimize the impact of problems or change orders which may arise during construction. Contractor shall specifically agree that float time may be used by the Owner or their Engineer in conjunction with their review activities or to resolve project problems. Contractor agrees that there will be no basis for a project time extension or a delay claim as a result of any project problem, Change Order or delay which only results in the loss of available positive float on the project schedule.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

Contractor further agrees that there will be no basis for a claim for cost escalation for any activity which is completed on or before its initially required late end date, as shown on the initial approved schedule, regardless of the justifiability of any delaying factors which might have resulted in elimination of float which was originally available for the activity.

2. Contractor agrees that no time extension will be granted for time lost due to normal seasonal weather conditions. In order to qualify for consideration for a time extension due to adverse weather conditions, it must be shown that the weather conditions during a given quarterly period (summer, fall, winter, spring) were more severe than geographical area and, in addition, that these weather conditions critically impacted the final project completion date by delaying the performance of work on the main project critical path. If abnormal weather losses can be shown to have affected the project critical path, a non-compensable time extension will be considered for that portion of the proven weather-related delays which exceeded the normal weather losses which should have been anticipated for the quarterly period in question.

No time extensions will be considered for any weather impacts which do not affect work on the main project critical path. Contractor agrees that there will be no basis for a claim for any additional compensation resulting from any time extension issued for weather- related delays.

3. In order for a given issue (i.e., delay, Change Order, etc.) to be considered as a basis for a total project time extension, it must meet both of the following criteria:
 - a) It must be totally beyond the control of the Contractor and due to no direct or indirect fault of the Contractor; and
 - b) It must result in a direct delay to work on the main project critical path.
4. Contractor acknowledges and agree that actual delays to activities which, according to the schedule, do not directly affect the main project critical path do not have any effect on the Contract Completion Date or dates and will not be the basis for a change therein.
5. Concurrent delays are defined as two (2) or more delays or areas of work slippage which are totally independent of one another and which, if considered individually, would each affect the final project completion date according to the Schedule.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

Where the Engineer determines that concurrent delays exist, Contractor acknowledges and agree that the following criteria will be used to evaluate time extension:

- a) If the current schedule shows two (2) or more concurrent delays, with one (1) analyzed to be the responsibility of the Owner and the other analyzed to be the responsibility of the Contractor, a time extension will only be considered if the Owner- caused delay affects the main project critical path and if this delay is shown by greater amount than the other concurrent delays when their impacts are independently considered. In this event, a time extension will only be considered for that portion of time by which the Owner-caused delay exceeds all concurrent non-Owner caused delays. For example, if an Owner-caused impact delays the project by 100 days and a concurrent Contractor-caused slippage independently delays the final completion date by 90 days, a compensation time extension will only be considered for a maximum of ten (10) days, provided the Owner caused delay is on the project critical path.

The Contractor acknowledges and agree that for the purposes of considering a time extension request, an activity will not be considered to have been subject to a claimed delay unless all originally scheduled predecessor activities have been completed so that no other restraints to the performance of that activity exist on the schedule at the time claimed for the delay impact.

Each request for change in any Contract Completion Date shall be submitted by the Contractor to the Engineer within ten days after the beginning of the delay for which a time extension is requested (unless the Engineer grants a further period of time before the date of final payment under this contract). No time extension will be granted for requests which are not submitted within the foregoing limit. No time extension request shall be considered unless it specifically contains at least the following detailed information:

- 1) Date delay began;
2. Date delaying impact was resolved;
- 3) Detailed chronology of delay including the dates of all applicable notifications and submittals;
- 4) Specific critical path activities affected and the dates of impact; and
- 5) In the case of Change Order Work, an analysis must be furnished showing the specific work required and the

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

manner in which this work will be interfaced with the schedule.

F. Delays Claims

1. Logs of Activity Performance - The Engineer will maintain a complete log of the actual start and finish date of each schedule activity as well as its percentage of completion for each month of the project. Records will also be carefully maintained of all changes in activity sequencing, duration, crew size and payment estimates, scope, etc. Change order or disputed work will be monitored on a daily basis, both for schedule performance and the manpower and cost of achieving daily performance.
2. Planned, Adjusted and As-Built Schedules - Information maintained by the Engineer will be used by the Owner as necessary in the preparation of AS-PLANNED, ADJUSTED AS-PLANNED and AS-BUILT network schedules for analysis of the extent and responsibility for any claimed delay. The amount of any equitable adjustment to the Contract will be determined both from the extent of the delay and the reasonable damages incurred by the Contractor based on considerations of the approved payment values of the base contract or changed contract work and/or recorded costs of disputed work.

G. Prevention of Delays - If Contractor causes a delay or is about to cause a delay due to lack of manpower or lack of construction equipment, the Engineer shall have the authority to direct the Contractor to add such additional resources as may be necessary, in the Engineer's opinion, to maintain or to regain schedule dates.

H. Penalties for Late Completion - This project has liquidated damage provisions as stipulated in the Contract. Information provided by the updating of the schedules will be utilized in determining responsibility for delays in the schedule. Should construction carry on beyond contract termination date, Contractor's financial responsibility will be so determined using the Official Project Schedule.

I. Compliance with the Schedule - If the Contractor fails to adhere to the Official Construction Schedule, or to its latest update, the Contractor must promptly adopt such other or additional means and methods of construction as will make up for the time lost and will assure completion of the work in accordance with said schedule. In the event a notice is received of a change in the contract or any extra work to be performed, or of any other conditions which are likely to cause or are actually causing delays, the Contractor shall notify the Engineer in writing within 10 days of the effect, if any, of such change, or extra work, or suspension or other conditions upon the Official Construction Schedule and shall state in what respects, if any, the Official Construction Project Schedule should be revised with the reasons therefore.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 PROGRESS PHOTOS

- A. The Contractor shall engage and pay for the services of a professional photographer to make photographs prior to accessing the site and each month thereafter at locations and at such stages of construction as directed by the Engineer. Upon completion of the project a minimum of fifty (50) views of the project site shall be taken as directed by the Engineer to indicate the general extent of the work.
- B. In addition, photographs shall be taken of all unusual construction areas and at street crossings, paved driveway crossings, and at all points of possible future controversy before any work at these points is started.
- C. The Contractor shall deliver one (1) print of each photo to the Engineer. Photographs shall be 8 x 10 inches in size, and shall have the following information typed and placed on the back of each photo.
 - 1. Title of project, photograph number (consecutive).
 - 2. Location of photograph and direction of view relative to project stationing.
 - 3. Date.
 - 4. Description of photograph including portion of work.
 - 5. Contractor's name.
- D. Contractor shall also deliver an electronic copy of progress photographs on a flash drive. Flash drive shall include a printed label with Contractor name, contract name and number, and date of photos.
- E. The selection of the subject matter and the time for taking photographs shall be determined by the Engineer. Fifty (50) photographs showing features of the work during each stage of the work, shall be furnished each month. In addition to the above photographs, the Contractor shall provide preconstruction and post-construction photos (50) and videos of the entire project area.
- F. The Contractor shall also videotape specific areas just prior to excavation. Preconstruction and post-construction filming shall be taken of the site for the entire project. Preconstruction filming shall be taken before any work is started. Post-construction filming shall be taken immediately after all work has been completed. Filming shall be taken to especially note the condition of any

CONTRACT NO. 22-522
DIVISION 1 – GENERAL REQUIREMENTS

structures, lawns, trees, sidewalks, fences, etc. on and adjacent to the work to ascertain whether or not these items have been replaced to their original condition. Ownership of the videotapes shall remain with the Owner.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. This Section specifies the requirements for making submissions for the project.

1.2 IDENTIFICATION OF SUBMITTALS

- A. Each and every submission shall be provided by the Contractor and shall be accompanied by a SUBMISSION TRANSMITTAL FORM. Identify each submittal and re-submittal using the form.
- B. It is incumbent on the Contractor to initially assign the submission log number designation to each submission. Submissions not containing a log number, as specified above, will be returned to the Contractor un-reviewed by the Engineer/Architect.
- C. Every submittal shall also be accompanied by a Transmittal Letter addressed to the Engineer/Architect's Project Manager.

1.3 COORDINATION OF SUBMITTALS

- A. Prior to submitting to the Engineer/Architect, fully coordinate all interrelated work. As a minimum, do the following:
1. Determine and verify all field dimensions and conditions by field measuring existing conditions and the installed work of this Contract and work by others.
 2. Coordinate with all trades, subcontractors, vendors, system and equipment suppliers and manufacturers, public agencies, and utility companies and secure all necessary approvals, in writing.
 3. Provide a space approximately 4" x 4" on submission transmittal form, transmittal letter, and shop drawings to record the Engineer's review, approval markings and the action taken.
- B. Make submittals in groups containing all associated items that in some way depend upon each other.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

1. The Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
2. The Engineer/Architect may elect not to review partial or incomplete submissions, whereupon he will notify the Contractor of the additional submissions that are required before a review can be made.

1.4 TIMING OF SUBMITTALS

- A. Make submittals far enough in advance of scheduled dates of installation to provide time for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery. The Engineer/Architect will review submittals in a manner as expedient as possible, and will generally send a written response to the Contractor within seven (7) calendar days of receipt of submittals.
- B. Submissions may be returned reviewed, rejected, returned conditioned upon submission of related items, or for other reasons set forth in the Contract Documents.
- C. Make submissions well in advance as the returning, rejecting or disapproval of submissions or other similar circumstances are possible and are deemed "avoidable delays". Costs for these delays or those attributed to Contractor's tardiness in making submittals shall be borne by the Contractor.
- D. Submittals requiring Engineer/Architect's review (except operations manuals) as required under the technical specifications of these documents shall be submitted prior to installation.
- E. Operations and maintenance manuals shall be submitted at least thirty (30) consecutive calendar days prior to scheduled start-up of the unit or system.
- F. If material or equipment is installed before it has been deemed to be in general compliance with the Contract Documents, as determined by the Engineer/Architect, the Contractor shall be liable for its removal and replacement at no extra charge and without an increase in contract time.
- G. No extension of Contract Time will be authorized because of failure to transmit submittals to the Engineer.

1.5 DESTINATION OF SUBMITTALS

- A. Submissions shall be sent to the Engineer/Architect's office to the attention of the Project Manager whom will be named in the Notice to Proceed or at the Construction Kick-Off meeting.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- B. When submitting samples, the contractor shall arrange for the delivery of said samples to the office of the Engineer. Samples shall be clearly marked with name of the project and the Engineer/Architect's project manager.
- C. The Contractor is responsible for the pick-up of the sample from the Engineer's office following approval. In the event that a sample is not retrieved from the Engineer's office within thirty days of approval, it will be disposed of.

1.6 CONTRACTOR'S REPRESENTATION

- A. By making a submission, the Contractor represents that he has determined and verified all field measurements and dimensions, field construction criteria, site and building constraints in terms of limitations in moving equipment into an enclosed space, materials, catalog and model numbers and similar data and that he has checked and coordinated each submission with other work at or adjacent to the project site as required

1.7 ENGINEER/ARCHITECT'S REVIEW

- A. Engineer/Architect will review and comment on each submission conforming to the requirements of this Section.
 - 1. Engineer/Architect's review will be for conformance with the design concept of the project and will be confined to general arrangement and compliance with the Contract Documents only, and will not be for the purpose of checking dimensions, weights, clearances, fittings, laying lengths, tolerances, interference's, for coordinating the work by others or subcontractors.
 - 2. The Engineer/Architect's review of a separate item, or portion of a system, does not represent a review of an assembly or system in which the item functions.
- B. The Engineer/Architect will mark submittals as follows:
 - 1. APPROVED_- No corrections, no marks. The content of this submittal has been reviewed by the Engineer/Architect and been found to be in general compliance with the Contract Documents. No further submission of this

submittal is required and the information contained in the submittal may be built into the work in accordance with the Contract Documents.
 - 2. APPROVED AS NOTED_- Minor amount of corrections. The content of this submittal has been reviewed by the Engineer/Architect and has been found in general to be in compliance with the Contract Documents. The notations made on the submittal by the Engineer/Architect shall be incorporated into the work in accordance with the terms and conditions of

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

the Contract Documents. No further submission of this submittal is required.

3. **REVISE AND RESUBMIT_** - The content of this submittal has been reviewed by the Engineer/Architect and this review has determined that additional data and/or modification to the submitted data or other changes are required to bring the work represented in this submittal into compliance with the Contract Documents. This submittal shall be reviewed and revised in accordance with the Engineer/Architect's comments and resubmitted to the Engineer/Architect for review. The information contained on the resubmittal shall not be incorporated into the work until the submittal is returned to the Contractor marked "APPROVED" or "APPROVED AS NOTED".
 4. **DISAPPROVED_** - The content of this submittal has been reviewed by the Engineer/Architect and has been determined not to be in accordance with the requirements contained in the Contract Document and requires too many corrections or other justifiable reason. The submittal shall be corrected and resubmitted or a submittal of an alternate shall be provided. No items are to be fabricated under this mark.
 5. **RECEIVED_** - This submittal is accepted on the project and filed for record purposes only, in accordance with the terms and conditions of the Contract Documents. Documents marked "RECEIVED" will not be returned.
- C. No payment will be made on any item for which a submission is required if such submission:
1. Has not been made,
 2. Has been made but was not stamped "Approved" by Engineer/Architect,
 3. Has been made and stamped "Approved As Noted", but contractor has not complied with Engineer/Architect's notes marked on the submittal,
 4. Has been made and stamped "Approved", but item provided does not conform to the shop drawing nor to the Contract Documents.
- D. Submittals not required by these specifications will not be recognized or processed.
- E. Provide space for the Engineer/Architect's review stamp.

1.8 RESUBMISSIONS

- A. Prepare new and additional submissions, make required corrections, and resubmit corrected copies until found in compliance with the Contract Documents.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- B. On, or with, resubmittals, clearly describe revisions and changes made, other than the corrections requested by Engineer/Architect, which did not appear on the previous submissions.

1.9 CONTRACTOR'S RESPONSIBILITIES

- A. Engineer/Architect's review of submittals shall not relieve the Contractor of his/her responsibility for any deviation from the requirements of the Contract Documents nor relieve the Contractor from responsibility for errors or omissions in the submittals.
- B. No portion of the work requiring a submission shall be commenced until the Engineer/Architect has found the submission in general compliance with the Contract Documents.
- C. The Contractor shall provide notification of any specification or drawing deviation.

1.10 MISCELLANEOUS SUBMITTALS

- A. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.11 SUBCONTRACTOR LIST

- A. The Contractor shall submit, on AIA Form G805, within ten (10) calendar days after the date of the Notice to Proceed, a list of all subcontractors, including the names of the major subcontractors that were submitted at the time of the bid.

1.12 MATERIAL SAFETY DATA SHEETS (MSDS)

- A. Comply with "Right to Know" requirements of Chapter 551 of Laws of New York, 1980, concerning notification of the use of toxic substances.
- B. Any product or substance used by the Contractor or its subcontractors which is listed in Subpart Z of OSHA Part 1910 Title 29 of the Code of Federal Regulations entitled "Toxic and Hazardous Substances" shall be identified to the Owner/Engineer/Architect by the Contractor's submission of a standard Material Safety Data Sheet (MSDS) in accordance with "Right To Know" requirements.
- C. Products will not be permitted to be kept on site without a MSDS.

1.13 SHOP DRAWINGS

- A. Submit shop drawings for all fabricated work, for all manufactured items and for items specifically required by the specifications.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- B. Submit one (1) copy of each standard drawing, catalog cut, or other material. The Engineer/Architect will return one (1) copy to the Contractor. The Contractor shall be responsible for providing approved shop drawings to their own subcontractors.
- C. Subcontractors shall submit shop drawings directly to the Contractor for checking. Thoroughly check subcontractors' shop drawings for measurements, sizes of members, details, materials, and conformance with the Contract Documents.
 - 1. Return submittals which are found to be inaccurate or in error.
 - 2. Do not submit to the Engineer/Architect until all corrections have been made.
- D. Clearly show the relationship of the various parts of the project and where the information provided on the submission depends upon field measurements and existing conditions.
- E. The Contractor shall make all measurements, confirm existing conditions, and include them on the shop drawings before making a submission to the Engineer/Architect.

1.14 CERTIFICATIONS

- A. Submit certifications of compliance indicated in the Contract Documents.
- B. Certifications shall be complete and exact, they shall be properly authenticated by the written signature, in ink, of an owner, officer or duly authorized representative of the person, firm or organization issuing such certification and they shall guarantee that the materials or equipment are in complete conformance with the requirements of these specifications.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

++ END OF SECTION ++

SECTION 01 35 29

HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section describes the minimum requirements for health and safety on the project.

1.2 DEFINITION

- A. Safety staff shall mean the safety professional and his safety representative(s) or the safety person.

1.3 GENERAL REQUIREMENTS

- A. In prosecuting the work of this Contract, the Contractor shall provide working conditions on each operation that shall be as safe and healthful as the nature of that operation permits. The various operations connected with the work shall be so conducted that they will not be unsafe or injurious to health; and the Contractor shall comply with all regulations and published recommendations of the New York State Department of Labor and all provisions, regulations and recommendations issued pursuant to the Federal Occupational Safety and Health Act of 1970 and the Construction Safety Act of 1969, as amended, and with laws, rules, and regulations of other authorities having jurisdiction, with regard to all matters relating to safe and healthful working conditions. Compliance with governmental requirements is mandated by law and considered only a minimum level of safety performance. All work shall also be performed in accordance with safe work practice.
- B. The Contractor shall be responsible for the safety of the Contractor's employees, the public and all other persons at or about the site of the work. The Contractor shall be solely responsible for the adequacy and safety of all construction methods, materials, equipment and the safe prosecution of the work.
- C. The Contractor shall employ a properly qualified safety professional familiar with all work under this contract whose duties shall be to initiate, review and cause implementation of measures for the protection of health and prevention of accidents.
- D. The Contractor shall at all times employ a properly qualified safety person familiar with all work under this Contract whose sole duties shall be to initiate, review and cause implementation of measures for the protection of health and prevention of accidents under this Contract.

CONTRACT NO. 19-925
DIVISION 1 – GENERAL REQUIREMENTS

- E. The safety staff shall be provided with an appropriate work area on the job site to maintain and keep available safety records, up-to-date copies of all pertinent safety rules, regulations and governing legislation, material safety data sheets, and the site safety plan including information concerning foreseeable emergency conditions, location of emergency and telephone contacts for supportive actions.
- F. The Contractor shall stop work whenever a work procedure or a condition at a work site is deemed unsafe by the safety staff.

1.4 SUBMITTALS

- A. The Contractor shall have a Health and Safety Plan (HASP) prepared, prior to the start of any construction. The HASP shall be available to workers on-site and be submitted to the Engineer and Owner at least 2 weeks before the beginning of any field work. Copies of the plan shall be provided to the Contractors' insurers and their risk managers, if any, by the Contractor.
- B. The HASP shall, at a minimum, demonstrate the manner in which the Contractor complies with all Occupational Safety and Health Administration (OSHA) standards applicable to the work to be performed under this Contract and specify safeguards to be implemented to protect worker health and safety. The HASP shall address, at a minimum, the following items in accordance with all applicable OSHA regulations:
 - 1. Health and Safety Organization including resumes of all personnel responsible for health and safety.
 - 2. Project Site Description and Hazard Assessment.
 - 3. Training.
 - 4. Project Site Control.
 - 5. Standard Operating Safety Procedures and Engineering Controls.
 - 6. Personal Protective Equipment (PPE).
 - 7. Personnel Hygiene and Decontamination.
 - 8. Emergency Equipment/First Aid Requirements.
 - 9. Emergency Responses/Contingency Procedures.
 - 10. Confined-Space Entry Procedures.
 - 11. Heat and Cold Stress.
 - 12. Record Keeping.
 - 13. Community Protection Plan.

CONTRACT NO. 19-925
DIVISION 1 – GENERAL REQUIREMENTS

- C. Within 30 days of receiving a Notice to Proceed, the Contractor shall submit the name of a safety professional, employed by the Contractor, responsible for project safety management, and of the safety representative(s) who will work under his direction.
- D. Documentation and/or personal references confirming the qualifications will be required. The persons proposed as safety person, safety professional or safety representative(s) may be rejected by the Engineer for failure to have adequate qualifications or other cause.

1.5 QUALIFICATIONS

- A. Safety Professional: Recognition as a safety professional shall be based on a minimum of: 1) certification by the Board of Certified Safety Professionals as a Certified Safety Professional and 5 years of professional safety management experience in the types of construction and conditions expected to be encountered on the site. In addition, this individual shall have the OSHA 30-Hour Construction Industry Outreach Training.
- B. Safety Person: Qualifications of the safety person must include a minimum of five years of relevant construction experience, two of which are related to safety management. In addition, this individual shall have the OSHA 30-Hour Construction Industry Outreach Training.
- C. The Safety staff shall be completely experienced with and knowledgeable of all applicable health and safety requirements of all governing laws, rules and regulations as well as of good safety practice. The safety staff shall not include the project manager, engineer, or superintendent, or anyone else working on the project. The safety staff shall have no other duties except those directly related to safety.
- D. Site Workers: All site workers shall have the OSHA 10-Hour Construction Industry Outreach Training.

PART 2 - PRODUCTS

2.1 HEALTH AND SAFETY PLAN

- A. The Contractor shall commit to writing a site-specific health and safety plan before the start of any construction.

2.2 ACCIDENT REPORTS

- A. The Contractor shall promptly report to the Engineer all accidents involving injury to personnel or damage to equipment and structures, investigate these accidents and

CONTRACT NO. 19-925
DIVISION 1 – GENERAL REQUIREMENTS

prepare required reports and submit a monthly summary of these accidents. The Contractor must submit a preliminary accident report to the Engineer by the following day at the latest.

1. The summary report, due by the 10th day of the following month, shall include descriptions of corrective actions to reduce the probability of similar accidents.
 2. In addition, the Contractor shall furnish to the Engineer a copy of all accident and health or safety hazard reports received from OSHA or any other government agency within one day of receipt.
- B. In addition to the reports which the Contractor is required to file under the provisions of the Workmen's Compensation Law, he shall submit to the Engineer on or before the tenth day of each month a report giving the total force employed on his Contract in man-days during the previous calendar month, the number and character of all accidents resulting in loss of time or considered recordable by OSHA, and any other information on classification of employees, injuries received on the work, and disabilities arising therefrom that may be required by the Engineer.
1. The submittal shall also contain an audit report for the prior month, including the safety training conducted, the above equipment logs, records of the condition of the work areas, safety and health records, OSHA and ANSI Z16.1 incidence rates for frequency and severity of recordable accidents, and an evaluation of the effectiveness of the HASP with any changes necessary.
 2. The Safety Professional or Safety Person and the Contractor shall sign this audit report. The Engineer will review these reports for Contractor's compliance with the safety provisions of the Contract.

2.3 SAFETY AND RESCUE EQUIPMENT

- A. The Contractor shall have proper safety and rescue equipment, adequately maintained and readily available, for any foreseeable contingency. This equipment shall include such applicable items as: proper fire extinguishers, first aid supplies, safety ropes and harnesses, stretchers, water safety devices, oxygen breathing apparatus, resuscitators, gas detectors, oxygen deficiency indicators, combustible gas detectors, etc. as determined necessary by the Contractor during preparation of the HASP.
- B. This equipment should be kept in protected areas and checked at scheduled intervals. A log shall be maintained indicating who checked the equipment, when it was checked, and that it was acceptable. This equipment log shall be updated monthly and be submitted with the monthly report. Equipment that requires calibration shall have copies of dated calibration certificates on-site.

- C. Substitute safety and rescue equipment must be provided while primary equipment is being serviced or calibrated.

2.4 PROTECTIVE EQUIPMENT

- A. All personnel employed by the Contractor or his subcontractors or any visitors whenever entering the job site shall be required to wear appropriate personal protection equipment required for that area. The Contractor shall provide all necessary personal protective equipment as requested by the Engineer for his designated representatives.

PART 3 - EXECUTION

3.1 SAFETY STAFF DUTIES

- A. The safety professional shall visit and audit all work areas as frequently as necessary (a minimum of once a week) and shall be available for consultation whenever necessary. The safety staff shall have full authority to implement and enforce the health and safety plan to take immediate action to correct unsafe, hazardous or unhealthful conditions.
- B. A member of the safety staff must be at the job site full time (a minimum of 8 hours per working day) whenever work is in progress. When multiple shift work is in progress, more than one safety representative may be required.
- C. The safety staff shall as a minimum:
 - 1. Schedule safety training programs as required by law, the safety plan, and good safety practice. An outline of materials to be covered shall be provided with the safety plan. All employees shall be instructed on the recognition of hazards, observance of precautions, of the contents of the safety plan and the use of protective and emergency equipment.
 - 2. Determine that operators of specific equipment are qualified by training and/or experience before they are allowed to operate such equipment.
 - 3. Develop and implement emergency response procedures. Post the name, address and hours of the nearest medical doctor; name and address of nearby clinics and hospitals, and the telephone numbers of the appropriate ambulance service, fire, and the police department.
 - 4. Post all appropriate notices regarding safety and health regulations at locations which afford maximum exposure to all personnel at the job site.
 - 5. Post appropriate instructions and warning signs in regard to all hazardous areas or conditions which cannot be eliminated. Identification of these areas

CONTRACT NO. 19-925
DIVISION 1 – GENERAL REQUIREMENTS

shall be based on experience, on-site surveillance, and severity of hazard. Such signs shall not be used in place of appropriate workplace controls.

6. Ascertain by personal inspection that all safety rules and regulations are enforced. Make inspections at least once a shift to ensure that all machines, tools and equipment are in a safe operating condition; and that all work areas are free of hazards. Take necessary and timely corrective actions to eliminate all unsafe acts and/or conditions, and submit to the Engineer each day a copy of his findings on the inspection checklist report forms established in the safety plan.
7. Submit to the Engineer, copies of all safety inspection reports and citations from regulating agencies and insurance companies within one work day of receipt of such reports.
8. Provide safety training and orientation to authorized visitors to ensure their safety while occupying the job site.
9. Perform all related tasks necessary to achieve the highest degree of safety that the nature of the work permits.

++ END OF SECTION ++

SECTION 01 45 00
QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for quality control services.
- B. Quality control services include inspections and tests and related actions including reports, performed by independent agencies, governing authorities, and the Contractor. They do not include Contract enforcement activities performed by the Engineer.
- C. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements.
- D. Requirements of this Section relate to customized fabrication and installation procedures, not production of standard products.
 - 1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Those requirements, including inspections and tests, cover production of standard products as well as customized fabrication and installation procedures.
 - 2. Inspections, test and related actions specified are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
 - 3. Requirements for the Contractor to provide quality control services required by the Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.3 RESPONSIBILITIES

- A. Contractor Responsibilities: The Contractor shall provide inspections, tests and similar quality control services, specified in individual Specification Sections and required by governing authorities, except where they are specifically indicated to be the Owner's responsibility, or are provided by another identified entity; these

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

services include those specified to be performed by an independent agency and not by the Contractor. Costs for these services shall be included in the Contract Sum.

The Contractor shall employ and pay an independent agency, to perform specified quality control services.

Where the Owner has engaged a testing agency or other entity for testing and inspection of a part of the Work, and the Contractor is also required to engage an entity for the same or related element, the Contractor shall not employ the entity engaged by the Owner, unless otherwise agreed in writing with the Owner.

- B. Retesting: The Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.

Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original construction.

- C. Associated Services: The Contractor shall cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:

1. Providing access to the Work and furnishing incidental labor and facilities necessary to facilitate inspections and tests.
2. Taking adequate quantities of representative samples of materials that require testing or assisting the agency in taking samples.
3. Providing facilities for storage and curing of test samples, and delivery of samples to testing laboratories.
4. Providing the agency with a preliminary design mix proposed for use for materials mixes that require control by the testing agency.
5. Security and protection of samples and test equipment at the Project site.

- D. Duties of the Testing Agency: The independent testing agency engaged to perform inspections, sampling and testing of materials and construction specified in individual Specification Sections shall cooperate with the Engineer and Contractor in performance of its duties, and shall provide qualified personnel to perform required inspections and tests.

1. The agency shall notify the Engineer and Contractor promptly of irregularities or deficiencies observed in the Work during performance of

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

its services.

2. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
3. The agency shall not perform any duties of the Contractor.

1.4 SUBMITTALS

The independent testing agency shall submit a certified written report of each inspection, test or similar service, to the Engineer, in duplicate, unless the Contractor is responsible for the service. If the Contractor is responsible for the service, submit a certified written report of each inspection, test or similar service through the Contractor, in duplicate.

- A. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:
 1. Date of issue.
 2. Project title and number.
 3. Name, address and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making the inspection or test.
 6. Designation of the Work and test method.
 7. Identification of product and Specification Section.
 8. Complete inspection or test data.
 9. Test results and interpretations of test results.
 10. Ambient conditions at the time of sample-taking and testing.
 11. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting.

1.5 QUALITY ASSURANCE

- A. Qualification for Service Agencies: Engage inspection and testing service agencies, including independent testing laboratories, which are prequalified as complying with "Recommended Requirements for Independent Laboratory

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

Qualification" by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.

Each independent inspection and testing agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State in which the Project is located.

1.6 REPAIR AND PROTECTION

- A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction and restore substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes. Comply with Contract Document requirements for section 1045 "Cutting and Patching."

Protect construction exposed by or for quality control service activities, and protect repaired construction.

Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01 55 26

TRAFFIC CONTROL

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. This section includes the provisions of maintaining vehicular and pedestrian traffic within in and around all work areas and protection for both the public and the Contractor's employees from all damage to person and property during the site work improvements.
- B. Maintenance and protection of traffic is the responsibility of the General Contractor.

1.2 SUBMITTALS

- A. The Contractor shall notify the roadway Owner and the Engineer at least seventy-two (72) hours prior to the closing of any portion of a road as might be necessary to perform the work and shall adequately describe the detour to be followed.
- B. The Contractor shall submit detailed drawings showing all signs, barricades, etc. for the closing of any portion of a road. These drawings shall be submitted for the Engineer's approval prior to any road closings. Only after drawing approval can the Contractor submit a request for road closing 72 hours prior to the anticipated closure. These shop drawings must be in full conformance with the requirements of the Manual of Uniform Traffic Control Devices.

PART 2 - MATERIALS

2.1 TRAFFIC DEVICES

- A. All temporary signs, delineators, barricades, lighting, and other warning and guiding devices shall be as shown and specified on the plans, the New York State Manual of Uniform Traffic Control Devices, the Traffic Maintenance Details of the standard details, and/or as required by the roadway owner.
- B. Unless otherwise specified, all materials used will remain the property of the Contractor.

PART 3 - EXECUTION

3.1 PREPARATION

- A. The Contractor shall obtain, supply and pay for all required electrical energy, services, permits, equipment, certificates, etc.

3.2 PERFORMANCE

- A. Traffic shall be maintained over a reasonably smooth traveled way, which shall be marked by signs, delineations, and/or other methods so that a person who has no knowledge of conditions can safely and with a minimum of discomfort and inconvenience, travel the area under construction. Standards for maintenance of traffic shall be based on the New York State Manual of Uniform Traffic Control Devices (referred to as "Manual") current edition.
- B. Adequate advance warning according to the "Manual" must be provided whenever traffic is interfered with or lanes are closed. All signs, markings, signals, barricades, lighting devices, and flagger operations shall conform to the "Manual". All necessary traffic control devices shall be available and in place before the particular construction operations are started. In case of emergency construction where there is not sufficient time to prepare a traffic plan, the Contractor shall be responsible for following the guidelines set forth in the "Manual."
- C. Access for emergency vehicles is of the utmost importance and provision shall be made by the Contractor to provide such access.
- D. Adequate provisions shall also be made for business and commercial establishments, schools, and public buildings.
- E. The Contractor shall generally maintain two (2) way traffic on streets where work is in progress and in no case shall he be permitted to work in adjacent streets.
- F. The Contractor shall maintain within the work limits the entire pavement, drainage and sewage facilities, and other street elements unless otherwise specified. The traveled way shall be kept well drained, reasonably smooth, cleaned and hard at all times. Foreign objects, sand, rocks, spillage of materials shall immediately be removed and the area cleaned to the satisfaction of the Engineer. Spillage outside the work limits is the Contractor's responsibility and the Owner will entertain no claim for work necessary to clean the areas affected. The Contractor shall be required to remove snow on those streets where roads are not passable by snow plows due to the Contractor's operation.
- G. Traffic delays shall be kept to a minimum. A period of five (5) minutes shall be considered the maximum time allowed for stopping traffic.

CONTRACT NO. 22-522
DIVISION 1 – GENERAL REQUIREMENTS

- H. Detour signs, barricades, and other facilities shall be furnished and erected as called for on the contractors approved plan and/or as directed by the roadway owner. The route of the detour shall be clearly marked at the beginning and end with directions at intermediate points along its entire length.
- I. The Contractor shall be responsible for notifying all interested agencies when detours or construction will interfere with the normal traffic flow. These agencies include, but are not limited to:
 - 1. Westchester County Department of Public Works & Transportation
 - 2. Town of Harrison (for Town roads)
 - 3. Westchester County Airport Operations
 - 4. Westchester County Police Department
 - 5. Town of North Castle (for Town roads)
- J. The Contractor will not be permitted to store spoil, materials, equipment, or supplies that will interfere with sight distances within thirty (30) feet of an intersection or areas where sight distance is critical.
- K. When travel must be diverted from the accustomed traveled way on to some other area, the Contractor shall grade, repair, stabilize, and provide ramps if necessary, to provide for the smooth flow of traffic. Upon completion of construction, the area utilized shall be restored to its original condition.
- L. The Contractor shall construct and maintain, where called for on the plans or as directed by the roadway owner, temporary bridges or bridging over excavations, obstructions, and newly laid pavements to provide access for pedestrian and vehicular traffic and access to fire hydrants. During construction, the Contractor shall take particular care to allow the ingress and egress of emergency vehicles from firehouses, police stations, hospitals, etc. Adequate provisions shall also be made for business and commercial establishments, schools, and for public buildings. Plating and/or bridging is required at all main intersections and heavily traveled crossings.
- M. Street signs, route markers, and other signs that fall under public jurisdiction, i.e., Bus Stop, Stop Signs, Parking Signs, etc., shall be protected and maintained or removed, stored, cleaned, and replaced when ordered by the roadway owner. The roadway owner may also order that these signs be temporarily relocated and then reinstalled in their original location. If in the course of construction, it becomes necessary to temporarily move a Bus Stop, the temporary site shall be approved by the County or local jurisdiction.

CONTRACT NO. 22-522
DIVISION 1 – GENERAL REQUIREMENTS

- N. The Contractor shall provide protection from damage to person or property by protective screens, fences, devices, or methods that are approved by the roadway owner.
- O. All signs, lights, barricades, and other materials installed to direct or warn the traveling public shall be maintained, repaired, and replaced by the Contractor. Vandalism or theft shall not preclude requirement and special attention shall be given to Traffic Maintenance and Protection during nonworking hours, weekends, holidays, and other periods or temporary shutdown of work.
- P. Materials, equipment, and workmanship for lighted barricades shall be in strict compliance with the National Electric Code and only a licensed electrician may perform the work.
- Q. Signs or markers lost, damaged, or removed by the Contractor shall be replaced at no cost to the Owner. Signs not to be replaced shall be cleaned and delivered to the Engineer.
- R. Temporary reflectorized pavement markings shall be placed where existing markings are obliterated, whenever it is determined that the roadway would be void of traffic markings for two (2) weeks or more, or as otherwise directed by the roadway owner and Engineer. The temporary markings shall provide the same number of through travel lanes as the previously existing markings.
- S. Sheeting
 - 1. Sheeting around excavations shall project four (4) feet above the surface of the ground to form a tight barricade. Where this requirement cannot be met, the excavation shall be surrounded with a metal fabric supported by approved uprights, set at maximum eight (8) foot intervals.
- T. Flagmen
 - 1. Competent flagmen shall be provided by the Contractor when ordered by the roadway owner or Engineer or as directed by the specifications. These flagmen shall have no function other than the direction of traffic. They shall wear safety vests and shall direct traffic with a red flag as required by the New York State Manual of Uniform Traffic Control Devices.
- U. Watchmen
 - 1. The Contractor shall provide watchmen service, during all nonworking hours for continuous patrol of the work site whenever excavations are left open overnight or whenever temporary bypass pumping is in place.

2. The watchmen will be responsible for making sure all signs, barricades, flares, and markers are up and in good condition and that the bypass force main is in good working condition.
3. Watchmen shall maintain daily logs of their patrols. Copies of these logs shall be made available to the Owner.
4. In the event that any unusual or emergency condition arises, the watchmen shall immediately notify the Contractor, the Engineer and the appropriate regulatory agency or emergency agency for assistance.
5. The Contractor may apply to the Owner for suspension of the watchmen service following construction but prior to completion of the work (when punch list items remain).
6. A deduction of three hundred (300) dollars per eight hour shift will be made for watchmen services not provided when required.

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Provide and maintain methods, equipment, and temporary construction, as necessary to provide controls over environmental conditions at the construction site and adjacent areas. Remove physical evidence of temporary facilities at completion of Work.

1.2 RELATED WORK

- A. Not used.

1.3 NOISE CONTROL

- A. Contractor's vehicles and equipment shall be such as to minimize noise to the greatest degree practicable. Noise levels shall conform to the latest OSHA standards and local codes.

1.4 DUST CONTROL

- A. Contractor shall be responsible for controlling objectionable dust caused by his operation of vehicles and equipment, clearing or for any reason whatever to the satisfaction of the Engineer.

1.5 PEST AND RODENT CONTROL

- A. Provide rodent and pest control as necessary to prevent infestation of construction or staging areas.
 - 1. Employ methods and use materials which will not adversely affect conditions at the Site or on adjoining properties.

1.6 WATER CONTROL

- A. Provide methods to control surface water and water from excavations to prevent damage to the Work, the Site, or adjoining properties.
 - 1. Control fill, grading and ditching to direct water away from excavations, pits, and other construction areas; and to direct drainage to proper runoff courses so as to prevent any erosion, damage or nuisance.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- B. Provide, operate and maintain equipment and facilities of adequate size to control surface water.
- C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the Site or to adjoining areas and in conformance with all environmental requirements.

1.7 POLLUTION CONTROL

- A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.
- B. Provide equipment and personnel, perform emergency measures required to contain any spillages, and to remove contaminated soils or liquids.
 - 1. Excavate and dispose of any contaminated earth off-site, and replace with suitable compacted fill and topsoil.
- C. Take special measures to prevent harmful substances from entering public waters.
 - 1. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.
- D. Provide systems for control of atmospheric pollutants.
 - 1. Prevent toxic concentrations of chemicals.
 - 2. Prevent harmful dispersal of pollutants into the atmosphere.
- E. All Contractor's equipment used during construction shall conform to all current federal, state, local laws and regulations.

PART 2 – PRODUCTS (NOT USED)

PART 3 – PAYMENT

3.1 MEASUREMENT AND PAYMENT

- A. No separate payment for the item “Environmental Protection Procedures” will be made. The costs of same shall be included in the Lump Sum Base Bid.

++ END OF SECTION ++

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL

- A. Contractor shall make all arrangements for transportation, delivery, storage and handling of equipment and materials required for prosecution and completion of the Work.
- B. Shipments of materials to Contractor or Subcontractors shall be delivered to the Site only during regular working hours. Shipments shall be addressed and consigned to the proper party giving name of Project, street and city. Shipments shall not be delivered to Owner except where otherwise directed.
- C. If it is necessary to move stored materials and equipment during construction, Contractor shall move or cause to be moved materials and equipment without any additional compensation.

PART 2 - PRODUCTS

2.1 DELIVERY

- A. Arrange deliveries of products in accordance with construction schedules and in ample time to facilitate inspection prior to installation.
- B. Coordinate deliveries to avoid conflict with Work and conditions at site and to accommodate the following:
 - 1. Work of Owner.
 - 2. Limitations of storage space.
 - 3. Availability of equipment and personnel for handling, products.
 - 4. Owner's use of premises.
- C. Do not have products delivered to Project Site until related Shop Drawings have been approved by the Engineer.
- D. Do not have products delivered to Site until adequate storage facilities have been provided.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- E. Have products delivered to Site in manufacturer's original, unopened, labeled containers. Keep the Engineer informed of delivery of all material to be incorporated in the Work.
- F. Partial deliveries of component parts of material shall be clearly marked to identify the material, to permit easy accumulation of parts and to facilitate assembly.
- G. Immediately on delivery, inspect shipment to assure:
 - 1. Product complies with requirements of Contract Documents and reviewed submittals.
 - 2. Quantities are correct.
 - 3. Containers and packages are intact, labels are legible.
 - 4. Products are properly protected and undamaged.

2.2 PRODUCT HANDLING

- A. Provide equipment and personnel necessary to handle products by methods to prevent soiling or damage to products or packaging.
- B. Provide additional protection during handling as necessary to prevent scraping, marring or otherwise damaging products or surrounding surfaces.
- C. Handle products by methods to prevent bending or overstressing.
- D. Lift heavy components only at designated lifting points.
- E. Materials 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.

PART 3 - EXECUTION

3.1 REMOVING, HAULING, AND INSTALLING EQUIPMENT AND MATERIALS

- A. 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 immediately be reported to the Engineer. The Contractor shall then carefully remove the equipment and materials from the truck or trucks on which it is shipped.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

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 that the equipment or materials may receive while being unloaded, transported, stored or installed. The Contractor shall employ competent workers experienced in the installation of the types of materials to be furnished, and shall ensure that all materials are installed in accordance with the recommendations of the manufacturer. All material that arrives at the job Site during normal working hours shall be unloaded as soon as practicable.

+ + END OF SECTION + +

NO TEXT ON THIS PAGE

SECTION 01 71 23

FIELD ENGINEERING

PART 1 – GENERAL

1.1 GENERAL

- A. The Contractor will establish benchmarks for use by the Contractor and his subcontractors, all other layout work shall be in accordance with the Contract Documents. The Engineer shall provide the Contractor with an AUTOCAD file of the design drawings for his use.
- B. Contractor shall:
 - 1. Provide civil, structural or other professional engineering services specified, or required to execute Contractor's construction methods.
 - 2. Develop and make all detail surveys and measurements needed for construction.
 - 3. Provide a transit and leveling instrument, stakes and accessories on the site at all times and a skilled instrument man employed or obtained whenever necessary for layout of the Work.
 - 4. Provide all material required for benchmarks, control points, batter boards, grade stakes, and other items.
 - 5. Be solely responsible for all locations, dimensions and levels. No data other than written order of the Owner shall justify departure from the dimensions and levels required by the Drawings.

1.2 DATUM PLANE

- A. All elevations shown on the Contract Plans or specified refer to the Project Datum, which has its benchmark as shown on the Contract Plans.

1.3 CONTRACTOR'S FIELD ENGINEER

- A. The Contractor shall employ and retain at the Site of the Work a field engineer and/or superintendent capable of performing all engineering tasks required of the Contractor. Tasks shall include as a minimum:

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

1. A projection of work to be completed the following day must be submitted to the Engineer by 4:00 p.m. of the preceding work day. This projection must include:
 - a. Location of all areas in which construction will be done.
 - b. Number of workers required each day
 - b. Major construction equipment utilized.
 - c. Equipment and materials to be installed.
2. Furnish all required lines and grades for construction operations. Check all formwork, reinforcing, subgrade, asphalt, other materials and equipment.
3. Maintain field office files and drawings, and Record Drawings. Prepare Layout and Coordination Drawings for construction operations.
4. Check and coordinate Work for conflicts and interferences and immediately advise the Engineer of all discrepancies noted.
5. Cooperate with Engineer in field inspections as required.
6. Follow without delay all instructions of the Engineer or assistants in the prosecution and completion of the work in conformity with this Contract. The Contractor's representative shall have full authority to supply labor and materials immediately.
7. The Contractor shall also have a competent representative available to receive telephone messages and provide a reasonable reply as soon as possible, but not later than 24 hours.

1.4 QUALIFICATIONS OF FIELD SUPERINTENDENT

- A. Qualified superintendent acceptable to the Engineer and Owner.

1.5 CONTRACTOR COST FOR ENGINEERS SERVICES

- A. In the event that the Engineer is required to provide additional engineering services as a result of substitution of materials or equipment which are not "or equal" by the Contractor, or changes by the Contractor in dimension, weight, power requirements, etc. of the equipment and accessories furnished, or as a result of the Contractor's errors, omissions or failure to conform to the requirements of the Contract Documents or if the Engineer is required to examine and evaluate any changes proposed by the Contractor solely for the convenience of the

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

Contractor, then the Engineer's charges in connection with such additional services shall be charged to the Contractor by the Owner.

- B. For all Shop Drawings related to this Contract:
1. The Contractor shall respond to required submittals with complete information and accuracy to achieve required approvals within two submissions. All costs to the Consulting Engineer involved with subsequent submission of the Shop Drawings, Samples or other items requiring approval, will be back charged to the Contractor at a rate of \$150 per shop drawing submittal or the actual cost based upon the number of hours to review the submittal times the Engineers' normal billing rate, whichever is greater. These costs shall be deducted from payments due for Work completed by the Contractor. In the event an approved item is requested by the Contractor to be changed or substituted for, all involved costs in the reviewing and approval process will likewise be back charged to the Contractor unless judged by the Engineer that the need for such deviation from previously approved data is beyond the control of the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 -EXECUTION (NOT USED)

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope of work:

1. This Section specifies all cutting and patching to be completed to execute all cutting and patching, including excavation, backfill and fitting required to:
 - a. Remove samples of installed Work as required for testing.
 - b. Remove or relocate utilities and pipes installed by others which obstruct the Work to which connections must be made.
 - c. Make connections or alterations to new facilities.
 - d. Restore all areas to a state equal to that which it was in prior to cutting and restore new Work to the standards of these Specifications.

1.2 SUBMITTALS

- A. Prior to cutting which may affect integrity and design function of Project or owner's operations, submit written notice to Engineer, requesting consent to proceed with cutting, including:
1. Identification of Project.
 2. Description of proposed Work:
 - a. Scope of cutting and patching.
 - b. Contractor, Subcontractor or trade to execute Work.
 - c. Products proposed to be used.
 - d. Extent of refinishing.
 - e. Schedule of operations.
 - f. Alternatives to cutting and patching, if any.
 - g. Designation of party responsible for cost of cutting and patching.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- h. Description of impact on traffic and permits required/ obtained if necessary

- B. Should conditions of Work, or schedule, indicate change of materials or methods, submit written recommendation to Engineer, including:
 - 1. Conditions indicating change.
 - 2. Recommendations for alternative materials or methods.
 - 3. Submittals as required for substitutions.

- C. Submit written notice to Engineer, designating time Work will be uncovered, to provide for observation. Do not begin cutting or patching operations until authorized by the Engineer.

- D. Provide shoring, bracing and support as required to maintain structural integrity of exposed areas and protect adjacent Work from damage during cutting and patching.

- E. Conform to all applicable Specifications for application and installation of materials used for patching.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1 GENERAL

- A. Execute cleaning during progress of the Work, at completion of the Work, and as specified herein.
- B. Requirements of Regulatory Agencies:
 - 1. In addition to the requirements herein, maintain the cleanliness of the Work and surrounding premises within the Work limits so as to comply with federal, state and local anti-pollution laws, ordinances, codes and regulations when disposing of waste materials, debris and rubbish.
- C. Scheduling of Cleaning and Disposal Operations: So that dust, wash water or other contaminants generated during such operations do not damage finished surfaces.
 - 1. To prevent accumulation of dust, dirt, debris, rubbish and waste materials on or within the Work or on the premises surrounding the Work.
- D. Waste Disposal:
 - 1. Dispose of all waste materials, surplus materials, debris and rubbish off the site.
 - 2. Do not burn or bury rubbish and waste materials on the construction site.
 - 3. Do not dispose of volatile or hazardous wastes such as mineral spirits, oil or paint thinner in storm or sanitary drains.
- E. Cleaning Materials:
 - 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.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

F. During Construction:

1. The Contractor shall remove and dispose of all debris resulting from work, at least twice a week and more often if same interferes with the work or presents a fire hazard. All debris and excess material shall be removed from the Owner's property. Burying of any debris or excess material within the premises will not be permitted. Burning of same will be strictly forbidden.
2. The Contractor shall provide a dumpster or other approved means of refuse removal for the use.
 - a. Dumpster shall be located where directed by the Owner.
 - b. Placing of the refuse in the dumpster shall be the responsibility of each individual Contractor.
 - c. Dumpster shall be emptied and replaced as required so that refuse may be disposed of as quickly as possible.
3. Keep the work and surrounding premises within work limits free of accumulations of dirt, dust, waste materials, debris and rubbish.
4. Keep dust generating areas wetted down or apply approved dust palliative at no additional cost to the Owner.
5. Dispose of waste, debris and rubbish off Site at legal disposal areas in accordance with local, state and federal codes and regulations.

G. Owners Right to Clean

1. Should the Contractor fail or refuse or neglect to remove rubbish and waste materials and temporary work or clean the buildings and premises as required herein, then the Owner may or shall, without obligation to do so, remove and dispose of said rubbish, waste materials and temporary work, and clean the buildings and premises and deduct the cost thereof from any money due or to become due the Contractor under his Contract.

H. When Project is Completed:

1. Contractor shall clean and maintain the Site in accordance with Division 1, Section 01 77 00, Contract Closeout.

+ + END OF SECTION + +

SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
1. Inspection procedures.
 2. Project record document submittal.
 3. Operating and maintenance manual submittal.
 4. Submittal of warranties.
 5. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate Sections.

1.3 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

1. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

Advise Owner of pending insurance change-over requirements.

Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.

Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.

Deliver tools, spare parts, extra stock, and similar items.

Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change-over in security provisions.

Complete testing of systems. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

- B. Inspection Procedures: On receipt of a request for inspection, the Engineer will either proceed with inspection or advise the Contractor of unfilled requirements. The Engineer will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
1. The Engineer will repeat inspection when requested and assured that the Work has been substantially completed.
 2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.
1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
 3. Submit a certified copy of the Engineer's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

dated by the Engineer.

4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the Work.
 5. Submit consent of surety to final payment.
 6. Submit a final liquidated damages settlement statement.
 7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- B. Reinspection Procedure: The Engineer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Engineer.
1. Upon completion of reinspection, the Engineer will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, reinspection will be repeated.

1.5 RECORD DOCUMENT SUBMITTALS

- A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Engineer's reference during normal working hours.
- B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
 2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
 3. Note related Change Order numbers where applicable.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.
- C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.
1. Upon completion of the Work, submit record Specifications to the Engineer for the Owner's records.
- D. Record Product Data: Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.
- Upon completion of mark-up, submit complete set of record Product Data to the Architect for the Owner's records.
- E. Record Sample Submitted: Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Architect and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.
- F. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Engineer for the Owner's records.
- G. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
1. Emergency instructions.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

2. Spare parts list.
3. Copies of warranties.
4. Wiring diagrams.
5. Recommended "turn around" cycles.
6. Inspection procedures.
7. Shop Drawings and Product Data.
8. Fixture lamping schedule.

1.6 CLOSEOUT PROCEDURES

A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants.
6. Fuels.
7. Identification systems.
8. Control sequences.
9. Hazards.
10. Cleaning.
11. Warranties and bonds.
12. Maintenance agreements and similar continuing commitments.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.1 GENERAL

- A. Contractor shall maintain and provide Engineer with Project record documents as specified below except where otherwise specified or defined in the Contract Documents.

1.2 MAINTENANCE OF DOCUMENTS

- A. Maintain in Contractor's field office in clean, dry, legible condition complete sets of the following: Contract Drawings, Specifications, Addenda, approved Shop Drawings, Samples, photographs, Change Orders, other Modifications of Contract, test records, survey data, Field Orders, and all other documents pertinent to Contractor's Work.
- B. Provide files and racks for proper storage and easy access. File in accordance with filing format of Construction Specification Institute (CSI) unless otherwise approved by Engineer.
 - 1. Make documents available at all times for inspection by Engineer and County representative.
 - 2. Record documents shall not be used for any other purpose and shall not be removed from the office without Engineer's approval.
 - 3. Submit updates with each monthly payment requisition.

1.3 RECORDING UPDATED INFORMATION

- A. General:
 - 1. Label each document "PROJECT RECORD" in 2-inch high printed letters.
 - 2. Keep record documents current, and updated at least monthly.
 - 3. Do not permanently conceal any Work until required information has been recorded.
- B. Contract Drawings: Legibly mark to record actual construction including:

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

1. Depths of various elements of foundation in relation to datum.
 2. Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvements.
 3. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
 4. Field changes of dimensions and details.
 5. Changes made by Change Order or Field Order.
 6. Details not on original Contract Drawings.
- C. Specifications and Addenda: Legibly mark up each Section to record:
1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
 2. Changes made by Change Order or Field Order.
 3. Other matters not originally specified.
- D. Shop Drawings: Maintain as record documents and legibly annotate Drawings to record changes made after review.

1.4 FINAL SUBMISSION OF RECORD DOCUMENTS

- A. Record Drawings shall be provided by the Contractor in accordance with the General Clauses, Article 53 "Record Drawings."
- B. Submittal:
1. At completion of Project, deliver record documents to Engineer.
 2. Accompany submittal with transmittal letter containing:
 - a. Date.
 - b. Project title and number.
 - c. Contractor's name and address.
 - d. Title and number of each record document.

CONTRACT NO. 22-522
DIVISION 1 - GENERAL REQUIREMENTS

- e. Certification that each document as submitted is complete and accurate.
- f. Signature of Contractor, or his authorized representative.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 02 32 19

EXPLORATORY EXCAVATIONS (TEST PITS)

PART 1 – GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Excavation of test pits where it may be necessary to locate or examine soils, groundwater, drains, pipes, rock, utilities, subsurface structures, or any other obstacles or subsurface conditions.
 - 2. Stockpiling, management, and disposal of surplus or unsuitable material.
 - 3. Backfilling and compacting of test pits with suitable material.
- B. Exploratory excavations shall be conducted where shown on the Drawings and where directed or approved by the Engineer
- C. Contractor shall coordinate work between all Subcontractors, sections, and trades required for the proper completion of the work.
- D. Contractor is responsible for all health and safety.

1.2 REFERENCES

- A. Reference herein to any technical society, organization, group or regulation are made in accordance with the following abbreviations and, unless otherwise noted or specified, all work under this Section shall conform to the latest edition as applicable.
- B. United States Code of Federal Regulations (CFR)
 - 1. 29 CFR 1926, Safety and Health Regulations for Construction.

1.3 SAFETY

- A. Contractor shall conduct all excavation activities in conformance with applicable regulations, including those relating to warning signs, excavation safety, sheeting, shoring, and stabilization.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

- B. Contractor shall provide and maintain barricades, signs, lights, etc., required for the protection of personnel, materials and property. Temporary barricades etc. shall conform with all applicable codes and regulations, and shall be lighted at night with lanterns, flares and reflectorized paint as required for safety. Adapt barricades, signs, lights, etc. to evolving site conditions throughout the progress of the work.
- C. Contractor shall provide other safety devices as required, including adaptation of such safety devices to changing site conditions, to prevent unauthorized entry to construction areas and open excavations. Provide warning signs and other temporary construction safety devices necessary for proper completion of the work in compliance with applicable safety regulations.
- D. Contractor shall properly design and furnish all labor, materials, equipment, and tools necessary to construct permanent or temporary excavation support systems, including, but not necessarily limited to, sheet piling, trench shields, trench boxes, timber trench shoring, pneumatic/hydraulic shoring, steel sheeting or sheeting using other materials, sloping, and benching.
- E. Any time an excavation is to remain open, at a minimum, the contractor shall provide full enclosure with safety barriers and fencing, warning signs, and additional safety control measures as appropriate for the condition.

1.4 SUBMITTALS

- A. Contractor shall submit record data of observations noted in test pits, including photographs, diagrams, and descriptive notes.

1.5 QUALITY ASSURANCE

- A. Contractor shall use adequate numbers of skilled workmen who are trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods required for proper performance of the work in this Section. Use equipment of adequate size, capacity and quantity to accomplish the work of this Section in a timely manner.
- B. Utility Mark Outs
 - 1. Prior to commencing work, comply with utility mark-out requirements on the Call-Before-You-Dig System (811).
 - 2. Verify the location of all subsurface utilities marked through the Call-Before-You-Dig System.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

3. Not all subsurface facilities or structures will be identified through the Call-Before-You-Dig System. Confirm the location of other subsurface utilities and other subsurface facilities or structures prior to commencing work. Field-mark utilities as required.

C. Utility Coordination

1. Inform all utility owners of the necessity of test pit work. Prove reasonable advance notice to allow for coordination.
2. Coordinate the excavation of all test pits with the respective utility owners having facilities in the vicinity of the test pit location.
3. If so desired by the respective utility owners, all or part of the work under this Section may be accompanied by their crews and/or supervised by them.

D. Utility Protection

1. Safeguard and protect from damage any utility to remain in service. Before excavating near any utility, notify the utility owner, coordinate protective work, and comply with the utility owner's requirements.
2. Where utilities are encountered, notify Engineer and document location and type of utility before proceeding with work in such area.
3. When uncharted or incorrectly charted piping or utilities are encountered during excavation, stop work and notify Engineer immediately. Cooperate with the utility owners in maintaining their utilities in operation prior to resuming work.

E. Retaining Structures

1. Provide bracing, shoring, sheeting, sheet piling, underpinning or other retaining structures necessary to guard against any movement or settlement of existing or new construction, utilities, paving, light standards, piping or conduit. Assume responsibility for the strength and adequacy of retaining structures, and for the safety and support of construction, utilities or paving, and for any movement, settlement or damage thereto.

1.6 SEQUENCING

- A. Contractor shall provide Engineer a minimum two (2) day notice prior to test pit excavation. Notify Engineer prior to backfill.

- B. If test pits are required during the work to evaluate unforeseen conditions, notify Engineer as soon as the need for such work is known.
- C. Notify Engineer and/or utility companies of any conflicts or other conditions observed which may require design revisions, relocations, and/or adjustment. No work shall be started within areas where conflicts or other conditions are observed which require design revisions, relocations, and/or adjustment until authorized by the Engineer.

PART 2 - PRODUCTS

2.1 SOILS

- A. Refer to Section 31 00 00, Earthwork.

PART 3 – EXECUTION

3.1 EXCAVATION

- A. Test pit excavation and backfill shall comply with applicable provisions of earthwork and excavation as indicated in other applicable Specification Sections.
- B. Excavation of test pits shall be accomplished by such means as are required to ensure that underground utilities or structures which may be encountered are not damaged.
- C. Contractor shall measure and record the size, configuration, exact horizontal and vertical location of all utilities, pipes or other conditions/obstacles encountered.
- D. Contractor shall be solely responsible for any damages incurred during excavation operations. Any such damages shall be repaired or replaced by Contractor to the satisfaction of the facility owner/operator, responsible/administering agency, and/or Engineer. Whether repair and/or replacement is conducted by Contractor or must be conducted by owner/operator or responsible/administering agency, any and all costs thereof, including those costs associated with planning, coordination and owner/operator or responsible/administering agency personnel, shall be borne by Contractor.
- E. Where an existing pavement has been removed for test pit excavation, the surface shall be restored in accordance with the Drawings and

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

Specifications. In all other areas, the surface of test pit areas shall be backfilled and the surface restored to a condition equal to original, unless otherwise indicated by the Engineer.

PART 4 – MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. The quantity of test pit excavation to be measured for payment shall be the number of cubic yards of material excavated, as ordered in writing by the Engineer, and as measured in its original position. No measurement for payment will be made for excavation beyond the limits ordered.

4.2 PAYMENT

- A. The contract price for test pits shall be the unit price bid per cubic yard for test pit excavation and backfilling and shall cover the cost of labor, materials, plant, equipment, samples, tests and insurance required and necessary to excavate all materials of whatever nature encountered (except excavation of boulders in open cut and ledge rock) as specified or ordered, including the providing of all additional sheeting and bracing; modifications to sheeting systems; pumping; bridging; decking; cleaning up; disposing of surplus and rejected excavated materials; grading and compacting subgrade; and do all work incidental thereto, all in accordance with the Plans, Specifications and Standards, and as directed by the Engineer.
- B. When the test pit is located within a paved area, payment shall include furnishing and installation of temporary asphalt pavement.
- C. No payment will be made for any test pits performed by the contractor that were not approved in writing by the Engineer prior to excavation.

++ END OF SECTION ++

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SECTION 02 33 13

UNDERGROUND UTILITY LOCATOR SERVICE

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01 71 23, Field Engineering.

1.2 REFERENCES

- A. American Society of Civil Engineers, CI/ASCE 38-02, “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data.”
- B. American Public Works Association, Uniform Color Code.”

1.3 DEFINITIONS

- A. Utility Quality Levels:
 - 1. Level A: Precise horizontal and vertical location of utilities obtained by the actual exposure (or verification of previously exposed and surveyed utilities) and subsequent measurement of subsurface utilities, usually at a specific point. Minimally intrusive excavation equipment is typically used to minimize the potential for utility damage. A precise horizontal and vertical location, as well as other utility attributes, is shown on plan documents. Accuracy is typically set to 15-mm vertical and to applicable horizontal survey and mapping accuracy as defined or expected by the project owner.
 - 2. Level B: Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities. Quality level B data should be reproducible by surface geophysics at any point of their depiction. This information is surveyed to applicable tolerances defined by the project and reduced onto plan documents.

1.4 DESCRIPTION

- A. Retain an independent utility locator service company to field locate and mark existing underground utilities and service connections. The word "independent" as used above means a person not in the regular employment of the Contractor or having any vested interest in the Contractor's business.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

1. Level B locator service shall be performed in all project areas where excavations, regrading of the ground surface, and penetrations of the ground surface are to be performed.
 - a. Contractor shall include a minimum of 32 hours of Level A locator service to locate underground utilities as identified on the contract drawings or as identified during the Level B investigation that require more specific location, invert elevation, size, etc. Level A investigation shall only be performed at locations where shown or as directed.
 - b. In heavy metal areas, such as near perimeter fences, ground penetrating radar shall be used to determine the location of underground utilities. The use of equipment that induce a tracing signal along the utility path (such as a Metrotech unit) can cause false readings, shall not be used within five feet of fences.
2. The Level A investigation shall be performed as follows:
 - a. Hand excavation may be performed for depths of three feet or less.
 - b. Vacuum excavation shall be performed at depths greater than three feet.
 - c. All excavation test pits shall be backfilled by close of business that day.
3. Support and protect all utilities and service connections to remain in place.
4. The locator service shall field locate and mark underground utilities and service connections prior to excavation.
5. The contractor shall be responsible for coordinating the extent of the areas of subsurface investigation required to locate all underground utilities and service connections in the areas of excavation.
6. All costs associated with the repair of underground utilities and service connections hit/damaged during the investigative work shall be the responsibility of the contractor.
7. Utility location services shall be in accordance with the provisions of CIASCE 38-02, “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data.”

1.5 SUBMITTALS

A. Quality Control Submittals:

1. Submit detailed experience and qualification information about the underground utility locator service company and the persons that will be performing the Work. Detailed experience and qualification information shall include:
 - a. Minimum of five (5) years experience in field locating, marking and staking out of existing underground utilities and service connections.
 - 1) Qualifying Experience: Project information of 5 similar projects, which the locator service company, had worked on during the past 5 years. Information shall include for each project:
 - a) Name and Address of project.
 - b) Dates worked on project.
 - c) Name and telephone Number of contact person at the project site for which the locator service was performed.
 - b. Description of types of utility locator equipment (investigation equipment) that company will utilize to perform the underground utility investigation.
 - c. Names of persons that the persons that will be performing the Work, including the number of years of experience and training that the persons have in the use of the equipment. Include copy of training certificates for locator equipment proving the person performing the locator service are trained on the equipment being used.
2. Submit Quality Control Submittals within 10 days of contract award.

B. Investigative Report:

1. Submit detailed written report and scaled drawings of the subsurface investigation, documenting all underground utilities and service connections located and identified.
 - a. All documentation shall be referenced to existing data (horizontal and vertical) previously established.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

- b. Provide three (3) paper copies and one (1) electronic copy of detailed written report and drawings.
2. Submit Investigative Report at least two weeks prior to advancing construction within the scheduled areas of excavation within the project site.

1.6 COORDINATION AND SCHEDULING

- A. Coordinate the Work to determine the extent of the areas of subsurface investigation required to locate all underground utilities and service connections in the areas of excavation.
- B. Coordinate the Work with the Westchester County personnel to minimize utility disruptions and facility operations. Provide a schedule for the Work required to the Westchester County personnel for approval. Upon approval of the schedule, notify the Westchester County personnel a minimum of three (3) working days prior to performing the Work.
- C. Within the areas of excavation, all underground utilities and service connections shall be field located and their locations marked at least two (2) weeks prior to the performance of the required excavation work.

PART 2 PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 WORK AREAS AND PERFORMANCE

- A. If any underground utilities and service connections are hit or damaged during the Work, immediately inform the Engineer for directions on how to proceed.
- B. The utility locator service investigative work, field location and marking of underground utilities and service connections and submission of the investigative report must be completed before any excavation work can begin.
 1. Contractor shall maintain markings throughout the contract duration or until a time when directed (in writing) by the Engineer that maintaining of the markings are no longer required.
- C. Provide subsurface investigation information, detailed written report and drawings of the subsurface investigation, documenting all underground utilities and service connections located and identified, prior to the performance of the required excavation work.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

- D. If during the Level B investigations, unknown underground utilities are discovered, the Engineer shall be notified as soon as possible or before the close of that business day.
- E. Field Marking of underground utilities shall follow the American Public Works Association (APWA) uniform color code:
- White: Proposed Excavation.
- Pink: Temporary Survey Markings.
- Red: Electric power lines, cables, conduit and lighting cables.
- Yellow: Gas, oil, steam, petroleum and gaseous material.
- Orange: Communications, alarm, signal lines, cables or conduit.
- Blue: Potable water.
- Purple: Reclaimed water, irrigation and slurry lines.
- Green: Sewer and drain lines.

++ END OF SECTION ++

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SECTION 02 40 00

DEMOLITION, REMOVALS AND MODIFICATIONS

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Contractor shall furnish all labor, materials, equipment and incidentals required for demolition, removals and disposal Work shown, specified and required to complete the project. Included are all modifications of existing facilities as shown and required to complete the Work.
- B. Included, but not limited to, are demolition and removals of existing materials, equipment, or work necessary to install the new Work as shown and specified and to connect same with existing work in an approved manner. The Work includes foundations, wooden exterior structures, manholes, piping, power lines, electrical and mechanical equipment, appurtenances, paving, walks, trees, shrubs, utilities and similar existing facilities.
- C. Demolitions, removals and modifications which may be specified under other Sections shall conform to requirements of this Section.
- D. Protection of site work and adjacent structures.
- E. Disconnection, capping and removal of utilities.
- F. Dismantled items to be retained by the Owner and to be reinstalled.
- G. No explosives are permitted.
- H. Related Work Specified Elsewhere:
 - 1. Section 31 00 00, Earthwork

1.2 SUBMITTALS

In accordance with the procedures and requirements set forth in the General Conditions and Division I, the Contractor shall submit the following to the Engineer for approval

- A. Schedule: Submit for approval proposed methods, equipment, and operations sequence. Include coordination for shut-off, capping, temporary services, continuation of utility services, and other applicable items to ensure no interruption of sewage flow or treatment.
- B. Submit selective demolition schedule.

- C. Informational Submittals: Submit copies of any notifications, authorizations and permits required to perform the Work. Submit a shipping receipt or bill of lading for all universal waste shipped.

1.3 JOB CONDITIONS

A. Protection

1. Contractor shall execute the demolition and removal Work to prevent damage or injury to structures, existing building services, occupants thereof and adjacent features which might result from falling debris or other causes, and so as not to interfere with the use, and free and safe passage to and from adjacent structures.
2. Contractor shall provide interior and exterior shoring, bracing and support to prevent movement, settlement, or collapse of existing structures or facilities. The Owner assumes no responsibility for the actual condition of the structures or facilities adjacent to the Work or the structures or facilities designated for removal or modifications.
3. Closing or obstructing of roadways, sidewalks, and passageways adjacent to the Work by the placement or storage of materials will not be permitted without proper permits and notifications, and all operations shall be conducted with a minimum interference to vehicular or pedestrian traffic.
4. Contractor shall erect and maintain barriers, lights, sidewalk sheds, and other required protective devices.
5. Contractor shall repair damages caused by his operation to facilities to remain, or to any property belonging to the Owner, utilities, or occupants of the facilities.
6. Contractor shall design, erect, install and maintain temporary partitions and enclosures required to eliminate dust, noise and debris from adjacent buildings.
7. The Work shall comply with the applicable provisions and recommendation of ANSI AIO.2, Safety Code for Building Construction, all governing codes and as hereinafter specified.
8. Contractor shall exercise precautions for fire protection. Burning of debris shall not be permitted.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

B. Scheduling

1. Contractor shall carry out all operations so as to avoid interference with operations.
2. The Contractor shall proceed with the removal of the equipment, piping and appurtenances in a sequence designed to maintain stormwater and sanitary sewer flows.
3. The Contractor shall be solely responsible for making all necessary arrangements and for performing all necessary work involving the discontinuance or interruption of all utilities or services.
4. Any equipment piping or appurtenances removed without proper authorization, shall immediately be replaced to the satisfaction of the Engineer at no cost to the Owner.

C. Notification

1. At least 48 hours prior to commencement of a demolition or removal, Contractor shall notify the Engineer in writing of his proposed schedule therefore. Owner will inspect the existing equipment and review with the Contractor those items which are to remain the property of the Owner. No removals shall be started without the permission of the Engineer.

D. Explosives

1. Do not bring explosives on site. No explosives will be permitted for this Project.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL

A. Disposition of Materials and Equipment.

1. All materials and equipment removed from existing work, shall become the property of the Contractor, except for those items which the Owner has identified and marked, to remain the property of the Owner. All materials and equipment so marked by the Owner shall be carefully removed by the Contractor, so as not to be damaged, and shall be cleaned of all solids and stored on or adjacent to the site in a protected place specified by the Owner.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

2. Contractor shall dispose of all demolition materials, equipment, debris, and all other items not to remain as property of Owner, off the site and in conformance with all existing applicable laws and regulations.
- B. Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.
1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.
 2. Clean adjacent structures, facilities, and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to conditions existing prior to the start of the Work.
- C. Demolition and Removals:
1. Unless otherwise approved by Engineer, proceed with demolition and removals from the top of the structure.
 2. Locate, identify, disconnect and seal or cap off utilities in buildings/ structures to be demolished.
 3. Demolish concrete and masonry in small sections.
 4. Break up and remove foundations and slabs where shown.
 5. Locate demolition and removal equipment throughout the structure in such a way and remove materials as frequently as necessary so as to not impose excessive loads to supporting walls, floors or framing.
- D. The Contractor, Owner, and Engineer shall jointly survey the condition of the adjoining structures prior to the execution of the work. Photographs and records shall be made of any prior settlement or cracking of structures, pavements, and the like, that may become the subject of possible damage claims. Photographs shall be taken in accordance with the requirements of the General and Supplementary Conditions.
- E. Do not close or obstruct streets, walks, drives or other occupied or used spaces or facilities without the written permission of the Owner and the authorities having jurisdiction. Do not interrupt utilities servicing occupied or used facilities without the written permission of the Owner and authorities having jurisdiction. If necessary, provide temporary utilities.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

- F. Cease operations if public safety or remaining structures are endangered. Perform corrective measures immediately. Notify authority having jurisdiction and the Owner. Do not resume operations until directed by the Owner.
- G. Do not damage building/mechanical/electrical elements and improvements indicated to remain.
- H. Do not use demolition debris as backfill.

3.2 STRUCTURAL REMOVALS

- A. Contractor shall remove concrete and structures to the lines and grades shown unless otherwise directed by the Engineer. Where no limits are shown, the limits shall be 4 inches outside the item to be installed. The removal of masonry beyond these limits shall be at the Contractor's expense and these excess removals shall be reconstructed to the satisfaction of the Engineer with no additional compensation to the Contractor.
- B. Locate, identify, disconnect and seal or cap off existing utilities in buildings, tanks, chambers and structures to be demolished.
- C. Determine the thickness of existing concrete to be removed and the extent to which they are reinforced. No additional compensation will be made because of variations from the thickness shown or for variations in the amount of reinforcement.
- D. All concrete, brick, tile, concrete block, roofing materials, reinforcement, structural or miscellaneous metals, plaster, wire mesh and other items contained in or upon the structure shall be removed and taken from the site, unless otherwise approved by the Engineer. Demolished items shall not be used in backfill.
- E. After removal of parts or all of masonry walls, slabs and like work which tie into new Work or existing work, the point of junction shall be neatly repaired so as to leave only finished edges and finished surfaces exposed.

3.3 PAVEMENT, CURB AND SIDEWALK REMOVALS

- A. Remove existing pavement and gravel roadway including base and surface courses, stabilized sub-bases, curbs, and gutters as required to construct new facilities or as shown. Before removing, saw a straight joint at least 1-1/2-inches deep between sidewalk and pavement designated for removal and that left in place. Provide neat saw cuts at limits of pavement removal as indicated. Curbs and gutters shall be removed to the nearest construction joint beyond the end of demolition symbol shown on the Contract Drawings.
- B. Determine the thickness of existing pavement, base, sub-base, curb, gutter, driveway pavement, and sidewalk to be removed and the extent to which they are reinforced.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

No additional compensation will be made because of variations from the thickness shown or for variations in the amount of reinforcement.

- C. Provide for satisfactory transition between replaced pavement and sidewalks and the portions remaining in place.

3.4 MISCELLANEOUS REMOVALS

- A. Contractor shall remove miscellaneous concrete walls, trees and shrubs, slabs, pipe supports, equipment pads, and curbs where shown on the Drawings or where necessary for the modification of the existing structures. Anchor bolts shall be cut back one inch below the surface and patched.

3.5 MODIFICATIONS AND CLOSURES

- A. Modifications shall conform with all applicable Specifications, the Drawings, and the directions and approvals of the Engineer.
- B. Where alterations require cutting or drilling into existing floors, walls, and roofs the damages shall be repaired in an approved manner. Contractor shall repair such openings with the same or matching materials as the existing floor, wall, or roof or as otherwise approved by the Engineer. All repairs shall be smoothly finished unless otherwise approved by the Engineer.
- C. Openings in existing concrete slabs, ceilings, roofs, masonry walls, floors and partitions which are not to be used in the new Work shall be closed and sealed as shown.
- D. All existing structures are to remain in service, demolish the portions to be removed, repair damages, and leave the structure in proper condition for the intended use. Remove concrete and masonry to the lines designated by drilling, chipping, and other suitable methods. Leave the resulting surfaces true and even, with sharp straight edges that will result in neat joints with new construction or be satisfactory for the purpose intended. Where existing reinforcing rods are to extend into new construction, remove the concrete so that the reinforcing is clean and undamaged. Cut off other reinforcing flush with the surface.
- E. New Work shall be keyed into the existing in an acceptable manner. In general, the same or matching materials as the existing adjacent surface shall be used. The finished closure shall be a smooth, tight, sealed, permanent closure with all exposed surfaces smooth finished and acceptable to the Engineer.
- F. Where existing reinforcement is to be exposed and incorporated into new concrete work, this reinforcement shall be sand blasted clean of all rust and concrete residue and painted with a zinc-rich primer paint.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

3.6 CLEANUP

- A. Contractor shall remove from the site all debris resulting from the demolition operations as it accumulates. Upon completion of the Work, all materials, equipment, waste, and debris of every sort shall be removed and premises shall be left, clean, neat and orderly.

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 02 80 00

WASTE TRANSPORTATION AND DISPOSAL

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The Contractor shall furnish all labor, materials, supplies, equipment, power, facilities and incidentals necessary to label, sample, test, manifest, transport and dispose of all waste and materials generated by the Work, and designated for removal from the site by the Owner, and any other materials as shown on the Contract Drawings and as directed by the Owner.
- B. Labeling, sampling, testing, manifesting, transporting and disposing of waste shall be performed in accordance with all applicable federal, state and local laws and regulations, including NYSDEC hazardous waste and transporter regulations (6 NYCRR Parts 364, 370-376) and USEPA PCB TSCA regulations (40 CFR Part 761) and the requirements of the disposal facility.
- C. The Contractor shall prepare and issue all notifications and apply for and obtain all permits and approvals required to complete the Work. All fees for licenses, permits, tolls, approvals, taxes, transportation fees, etc. shall be the responsibility of the Contractor.
- D. The Work shall be performed in accordance with all the approved submittals.
- E. Materials removed from the site shall be transported directly to facilities which have received prior approval of the Owner.
- F. Related Work Specified Elsewhere:
 - 1. Section 02 40 00, Demolition, Removals and Modifications.
 - 2. Section 02 83 00, Hazardous Materials Removal.
 - 3. Section 31 00 00, Earthwork

PART 2 - PRODUCTS – (Not Applicable)

PART 3 - EXECUTION

- A. The Contractor shall provide all required notifications to federal, state and local agencies prior to transporting material off-site. Copies of all notifications issued by the Contractor shall be transmitted to the Engineer at the time of issuance.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

- B. Contaminated materials removed from the site shall not be combined with non-contaminated material. Material characterized as hazardous waste, if any, shall not be combined with any other material.

- C. The Contractor shall be responsible for all sampling and analyses required for disposal. The Contractor shall provide his own data for this purpose. All sampling shall be conducted with the Engineer present. The Contractor shall be required to obtain approval from the Engineer and the Owner of the sampling and analytical methods and the analytical laboratory to be used. The results of all analyses shall be submitted to the Engineer prior to removal of any material from the site. The time and date of collection and sample identification numbers shall be clearly indicated on the results of analyses furnished to the Engineer.

- D. The Contractor shall acquire and complete all required manifest forms and bills of lading as required by applicable laws and regulations for transportation and disposal of materials off-site. The Contractor shall provide all required manifests and bills of lading to the Engineer along with all requested backup documentation. The Engineer or Owner's Representative shall sign manifests and bills of lading for the Owner. However, the Contractor shall be responsible for assuring that all notifications, labeling, documentation, sampling, analysis, transportation and disposal requirements of the disposal facility, and federal, state and local requirements are complied with and properly documented. Waste manifests submitted to the Owner and Engineer shall be furnished with a certification signed by the Contractor stating that all requirements of the disposal facility, and federal, state and local governments are complied with.

- E. The Contractor shall provide letters of commitment from all disposal facilities to the Engineer. The letters of commitment shall state that the facility is able to accept the waste which the Contractor intends to ship to the facility.
 - 1. Letters of Commitment shall be obtained by the Contractor from all waste haulers and from all transfer, treatment, storage and disposal facilities to which the Contractor intends to ship any and all waste and other materials generated by the Work. The letters of commitment shall specifically identify the types and quantities of waste that the facility will be able to accept from the Contractor, the permit numbers for all facilities at which the waste will be accepted and all waste characterization requirements. In the event that a facility (such as a privately owned treatment works) is prohibited from issuing a letter of commitment without a sample of the waste, a conditional type letter will be acceptable. Such a conditional letter shall specifically state what types and quantities of waste the facility will accept. In addition, the following information shall be submitted:

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

- a. For each waste hauler
 - 1) Name and federal and state identification numbers.
 - 2) Address.
 - 3) Name of responsible contact for the hauler.
 - 4) Telephone number for the contact.
 - 5) List of types and sizes of all transport vehicles and equipment to be used.
 - 6) A description of proposed transportation route, method and procedures for hauling waste material, including type of vehicles that will be used for each type of waste.
 - 7) Copies of any and all necessary permits and authorizations for each type of waste transported, including the transporter's EPA ID Number and Part 364 Permit Number, if applicable.

- b. For each transfer, treatment, storage and disposal facility, the Contractor shall submit the following information.
 - 1) General Information:
 - a) Facility name and federal and state identification numbers
 - b) Facility location
 - c) Name of responsible contact for the facility
 - d) Telephone number for contact
 - e) Signed letter of commitment to accept waste as specified in this Contract
 - f) Unit of measure utilized at facility for costing purposes
 - 2) Copies of all permits, licenses, letters of approval, and other authorizations to operate, held by the proposed facility as they pertain to receipt and management of waste derived from this Contract.
 - 3) The Contractor shall identify the unit(s) that the facility will use to manage the waste.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

- 4) The Contractor shall provide the date of the proposed facility's last compliance inspection by all federal, state and local government agencies.
 - 5) List of all active (unresolved) compliance orders (or agreements), enforcement notices, or notices of violation issued to the proposed facility.
 - 6) For all facilities utilized for the disposal of metal coated with or containing lead, the Contractor shall provide all information required by 6 NYCRR Part 371.1(c)(7)(ii).
- F. Vehicles used to haul materials shall be designed, equipped, operated and maintained to prevent leakage, spillage or airborne emissions during transport. The containers shall be lined with 10-mil polyethylene sheeting prior to loading, if determined necessary for the given waste type, as determined by the Engineer.
- G. Certified weigh tickets showing the weight of the vehicle at the time of arrival and departure from the disposal facility shall be provided as a prerequisite to payment for all material transported off-site. The weight tickets shall be signed and dated by a representative of the Contractor certifying to the accuracy of all measurements, the date and time of arrival and departure of each vehicle, the disposal location and the vehicle identification number.

++ END OF SECTION ++

SECTION 02 83 00

HAZARDOUS MATERIALS REMOVAL

PART 1 – GENERAL

1.1 DESCRIPTION

- A. The Contractor shall furnish all labor, materials, supplies, equipment, power, facilities and incidentals necessary to remove all hazardous materials that will be impacted by the proposed Work, as shown on the Drawings and Exhibit A of this specification, and as specified and as directed by the Engineer. The Contractor shall remove, transport and dispose of all hazardous materials identified in the building in accordance with all applicable federal, state and local regulations. Refer to the Appendix 3 for the hazardous materials assessment report prepared by D&B Engineers and Architects, which formed the basis for the identification and quantification of hazardous materials requiring removal.
- B. Note that this specification is only applicable to hazardous materials removals other than asbestos.
- C. The Contractor shall remove and properly manage all hazardous materials prior to initiating any demolition activities, unless approval is granted by the Engineer. The Contractor shall furnish all labor, materials, services, insurance, permits and equipment necessary to carry out the proper removal, transportation and off-site disposal of these items in accordance with the requirements set forth in this specification. If the Contractor uses a subcontractor to perform the work required under this Contract, these specifications shall apply to that subcontractor, which shall be referred to as the Hazardous Material Subcontractor. The Contractor's use of a Hazardous Material Subcontractor shall not relieve Contractor of full responsibility for the work to be performed. The requirements included are to be adhered to as they apply to this Contract. The Contractor and subcontractors are responsible for complying with all applicable federal, state and local laws, codes, rules and regulations. Lastly, the quantities of hazardous materials contained in this specification and shown on the Drawings are estimated. The Contractor and its subcontractor shall be responsible for verifying the quantities of hazardous materials and including the management of all such materials in its bid.
- D. The project includes work in separate and distinct work areas in the building and/or facilities as described below:
 - 1. Prior to any demolition activities, the Contractor shall utilize appropriately trained workers to perform the required hazardous materials removal. If asbestos is present and the Contractor elects to remove the

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

specified hazardous materials prior to the performance of asbestos abatement, the Contractor shall utilize only New York State Department of Labor (NYSDOL) asbestos workers for the work, who will be working in the regulated abatement areas.

2. Lead abatement is not required as part of this project. However, Contractor shall ensure that all loads of lead-containing/coated materials to be managed as construction and demolition debris or other manner does not exceed the Toxicity Characteristic Leaching Procedure (TCLP) Regulatory Levels for metals (40 CFR 261.24). In the event that a load exceeds a TCLP Regulatory Level, the load must be managed as hazardous waste in accordance with 40 CFR 260 through 268 and 6 NYCRR 370 through 376. In the event that the lead containing/coated component is composed of metal and the Contractor intends to recycle the material as scrap metal, the Contractor shall submit to the Engineer for review and approval the information required by 6 NYCRR 371.1(c)(7)(ii) prior to the removal of any such material from the site. Lead in paint analytical results are summarized in the hazardous materials assessment report. The Contractor shall perform all work involving lead-containing/coated materials in accordance with OSHA's "Lead in Construction" Rule (29 CFR 1926.62).
3. Contractor shall assume that all fluorescent light ballasts contain over 500 parts per million (ppm) of PCBs, unless the ballasts are labeled "Non-PCB" or similar. All ballasts are to be removed in USDOT-approved 55-gallon drums and recycled pursuant to 40 CFR 761.60-62 and 49 CFR 172.
4. Contractor shall remove and manage all lamps as Universal Waste in approved containers pursuant to the New York State Department of Environmental Conservation's (NYSDEC's) Universal Waste regulations found at 6 NYCRR 374-3.
5. The Contractor shall prepare manifests and/or shipping papers for the waste. The Contractor shall provide prepared manifests and/or shipping papers to the Engineer for review and signature by the Owner or authorized agent.
6. Contractor shall provide sufficient containerized storage or secured stockpiles to allow for testing of the materials after removal, and before disposal, in accordance with the disposal facility's requirements. The Contractor shall have the appropriate permits for the disposal facilities to accept the material. Applicable permits or certification by the disposal facility that they will accept the material throughout the contract time is required.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

7. All material shall be transported under bills of lading or manifests approved by the Owner.
8. If, at any time, the Engineer decides that work practices are violating pertinent regulations or, in its opinion, endangering workers or the public, the Engineer will immediately notify the Contractor (followed up in writing) that operations shall cease until corrective action is taken by the Contractor. The Contractor shall take such corrective action before proceeding with the Work. Loss or damage due to Stop Work Order(s) shall be the Contractor's responsibility.

E. Related Work Specified Elsewhere:

1. Section 01 35 29, Health, Safety and Emergency Response Procedures.
2. Section 02 40 00, Demolition, Removals and Modifications.
3. Section 02 80 00, Waste Transportation and Disposal.

1.2 PHASING OF WORK

- A. The Contractor shall perform and complete the hazardous material removal activities as directed by the Owner and the Engineer, prior to any demolition activities so as to not commingle the waste streams. The Contractor shall prepare manifests and/or shipping papers for the waste and provide to the Engineer for review and signature by the Owner or authorized agent.

1.3 OWNER TO STOP WORK

- A. The Owner and the Engineer shall have the authority to stop the work at any time that a determination is made that conditions are not within Specification and/or applicable regulations. The stoppage of work shall continue until conditions have been corrected to the satisfaction of the Owner and Engineer. Standby time and cost to resolve the problems shall be at the Contractor's expense.

1.4 HEALTH AND SAFETY REQUIREMENTS

This subsection is intended to supplement the requirements of Section 01 35 29 (“Health, Safety and Emergency Response Procedures”).

A. General Description:

1. The Contractor shall be responsible for compliance with the most stringent provisions of the applicable statutes and regulations of the State of New York and the United States, and that, without limitation, the

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

provisions of the United States Department of Labor Occupational Safety and Health Administration (OSHA) are observed and that the methods of performing the work do not involve undue danger to the personnel employed thereon, the public, and public or private property. Should charges of violation of any of the above be issued to the Contractor in the course of the work, a copy of each charge and resolution thereof, shall immediately be forwarded to the Owner.

2. The Contractor shall provide materials, equipment and training to its workers to ensure their protection from any chemical/biological hazards that may be identified during the course of this work.
3. Physical Hazards: The Contractor shall provide safety equipment and training to its workers to ensure their protection from any physical hazards including but not limited to trip/fall hazards, working at elevation, working on an inclined work area, heat stress, contact with energized (hot) active equipment, noise, overhead bump hazards, and electrical shock that may be present during the Work. Specific requirements include the development and implementation of a site-specific Health and Safety Plan (see Section 01 35 29). Documentation of training in the use of fall and fire protection equipment and methods shall be required for all site personnel. The Contractor shall provide a competent on-site person to supervise the project at all times.
4. Safety Act: The Williams-Steiger Occupational and Safety Health Act (OSHA) of 1970, as amended, shall be strictly complied with during the course of this project. This Act shall govern the conduct of the Contractor's workmen, tradesmen, material men, subcontractors, and visitors to the project site.
5. Accident Prevention: In order to protect the lives and health of his employees, the Contractor shall comply with all pertinent provisions of the latest edition of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc. and shall maintain an accurate record of all accidents which occur during the project. After attending to the injured person(s), the Contractor must immediately report an injury or loss of life to the Owner and Engineer, and a copy of the Contractor's report to his insurer of an accident must be provided to the Owner and Engineer.
6. Emergency Response: The Contractor shall establish an Emergency Response Team made up of members of his work force. Team members shall be trained, organized, and capable of responding in the event of an accident, fire, or other emergency. The Contractor shall designate a site Safety Coordinator to train team members regarding the location and use of site-specific fire/life safety equipment. As a minimum requirement,

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

members of the Emergency Response Team shall be knowledgeable in standard first aid and CPR techniques, fire extinguisher use, and evacuation procedures.

7. Workmen Protection: The Contractor shall provide and maintain all safety measures necessary to properly protect workmen.
8. Emergency Actions: In an emergency affecting safety or life, the work or an adjoining property, the Contractor, to prevent such threatened loss or injury without special instruction or authorization from the Owner or the Engineer, is hereby permitted to act at his discretion.
9. Hazard Communication Act: The Contractor shall comply with the Hazard Communication Standard promulgated by the Occupational Safety and Health Administration (29 CFR 1910.1200). This program ensures that all employers provide the information and training that employees need to work safely and to design and implement an employee protection program. It also provides necessary hazard information to employees, so they can participate in, and support, the protective measures needed at their workplace. The Contractor shall ensure that labels or other forms of warning are legible in English. The Contractor shall provide employees who speak other languages, as required, to communicate with employees in their language.

1.5 WORK SUPERVISION AND COORDINATION

- A. Contractor's Supervisor: From the start of the Work through project completion, the Contractor shall have on-site a responsible and competent supervisor. The Supervisor shall be on-site during all working hours. When the Supervisor must leave the site during the Work, all work must cease unless a replacement Supervisor is present. The Supervisor shall be fluent in speaking and writing English.
- B. Quality of Work: The Supervisor shall supervise, inspect and direct the Work competently and efficiently, devoting such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. The Supervisor shall be responsible to see that the Work complies accurately with the Contract Documents, and that all Work is of good quality and workmanship.

1.6 SUBMITTALS:

The Contractor shall submit the following, as noted below, in accordance with the requirements specified in Section 01 33 00, Submittal Procedures.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

- A. Pre-Project Submittals shall be submitted prior to the performance of any work, as follows:
1. Hazardous Material Removal Work Plan: Provide a detailed written Hazardous Material Removal Work Plan that describes the procedures for the removal, characterization, packaging, loading, transportation and off-site disposal of the hazardous materials identified for disposal. The plan shall include, at a minimum, the following:
 - a. Identification of proposed transporters and disposal/recycling facilities for the off-site disposal/reuse of hazardous materials (see Section 02 80 00). The waste to be sent to each disposal facility shall be specified.
 - b. Copies of applicable permits for the proposed transporters and disposal/recycling facilities (see Section 02 80 00).
 - c. Proposed level of worker training for each type of hazardous material to be removed.
 - d. Names and applicable licenses of key personnel.
 - e. Proof of appropriate training for workers.
 - f. Proof of a current medical surveillance program for all Contractor personnel to work on this project.
 - g. Safety Data Sheets (SDS) for any chemicals to be used on this project. All products to be used on this project must have an SDS approved by, the Engineer.
 - h. Proposed Detailed Work Schedule
 - i. Procedures for the characterization of unknown materials including, but not limited to, sample collection procedures, number of proposed samples and analytical methods.
 - j. Proof of experience required by Part 1.11 of this Section.
 2. A list that identifies the make, model, truck number and registration plate number of each of the trucks that will transport the material to the off-site facilities. Any change of trucks, or additional trucks, must have prior approval at least 24 hours in advance.

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

3. Results of all analytical sampling data and complete copies of all chain-of-custody forms shall be provided to the Owner at the completion of the work, unless specified otherwise.

B. During Work Submittals:

1. Schedule of Work Change: Any changes in the Schedule of Work proposed by the Contractor shall be submitted for approval no later than seven days prior to the commencement date of the proposed change.
2. A certified, signed, and completed copy of each waste shipment record form used, and receipts from the off-site disposal or recycling facility which acknowledge the Contractor's delivery(s) of material, shall be submitted to the Engineer and Owner within thirty days following removal of hazardous materials from the site.

C. Post Project Submittals:

1. A notarized "Release of Liens" in a form acceptable to the Owner. The Contractor shall use the Standard AIA form. Such notarized release of all liens shall certify that all subcontractors, labor suppliers, etc., have been paid their pro rata share of all payments to date, that the Contractor has no basis for further claim, and will not make further claim for payment in any account after the first payment is made to him.
2. Compilation of all completed and signed waste shipment record forms, bills of lading or disposal/recycling receipts pertaining to this project.
3. Contractor shall submit the following items as part of its final submittals: Paid invoice verifications for subcontractor, service contract agreement, insurance certificates, copies of the worker licenses, if required, and other submittals required for the Specification.

1.7 FIRE PROTECTION AND EMERGENCY EGRESS

- A. The Contractor shall be responsible for the security and safeguarding of all areas turned over by the Owner to the Contractor. The Contractor shall identify to his workers and other building occupants the means of egress in case of emergency.
- B. The Contractor shall establish emergency and fire exits from the work area. First aid kit, protective clothing and respirators shall be provided for use by qualified emergency personnel.

1.8 CLEANUP

- A. Final Site Cleaning: Upon completion of the work, the Contractor shall remove all temporary construction, decontamination facilities, and unused materials placed on-site by the Contractor; leave the premises in a neat and clean condition; and perform all sweeping, cleaning and washing required to restore the condition of the site to its original condition.

1.9 CODES, PERMITS AND STANDARDS

- A. The Contractor shall be solely responsible for compliance with all applicable federal state and local laws, ordinances, codes, rules and regulations that govern the removal, characterization, storage, transportation and off-site disposal or recycling of the hazardous materials listed in the Contract Documents. The current issue of each document shall govern. All work shall comply with all applicable codes and regulations as amended. The applicable regulations for the removal, characterization, storage, transportation, and off-site disposal and/or recycling of the hazardous materials include, but may not limited to, the following:

Code of Federal Regulations (CFR)

1. 29 CFR 1910, Occupational Safety and Health Regulations for General Industry
2. 29 CFR 1926, Occupational Safety and Health Regulations for Construction
3. 40 CFR 261, Identification and Listing of Hazardous Wastes
4. 40 CFR 262, Standards Applicable to Generators of Hazardous Waste
5. 40 CFR 263, Standards Applicable to Transporters of Hazardous Waste
6. 40 CFR 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
7. 40 CFR 265, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
8. 40 CFR 268, Land Disposal Restrictions
9. 40 CFR 302, Designation, Reportable Quantities and Notification
10. 40 CFR 355, Emergency Planning and Notification
11. 40 CFR 761, Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

12. 49 CFR 171-179, Hazardous Materials Transportation Act
Codes, Rules and Regulations of the State of New York (NYCRR) Title 6
 1. Part 360, Solid Waste Management Facilities General Requirements
 2. Part 361, Material Recovery Facilities
 3. Part 362, Combustion, Thermal Treatment, Transfer and Collection Facilities
 4. Part 363, Landfills
 5. Part 364, Waste Transporters
 6. Part 365, Regulated Medical Waste and Other Infectious Wastes
 7. Part 370, Hazardous Waste Management
 8. Part 371, Identification and Listing of Hazardous Wastes
 9. Part 372, Hazardous Waste Manifest System and Related Standards for Generators, Transporters, and Facilities
 10. Part 373, Treatment, Storage, and Disposal Facilities
 11. Part 374-2, Standards for the Management of Used Oil
 12. Part 374-3, Standards for the Management of Universal Wastes
 13. Part 376, Land Disposal Restrictions
 14. Part 380, Prevention and Control of Environmental Pollution by Radioactive Materials
 15. Part 381, Transporters of Low-Level Radioactive Waste
 16. Part 596: Hazardous Substance Bulk Storage Facility Registration
 17. Part 597: Hazardous Substances Identification, Release Prohibition, and Release Reporting
 18. Part 598: Handling and Storage of Hazardous Substances
 19. Part 613: Petroleum Bulk Storage
- B. Where conflict among requirements or with these specifications exists, the more stringent requirements shall apply.

- C. Permits, State Licenses and Notifications: The Contractor shall be responsible for obtaining necessary permits, licenses and certifications of personnel in conjunction with removal, hauling and disposition of hazardous materials and shall provide timely notification of such actions as may be required by federal and state authorities. Fees and/or charges for these licenses, permits and notifications shall be paid by the Contractor. Contractor shall use all notification forms where applicable.

1.10 TERMINOLOGY

- A. The following commonly used terms are defined in the context of these specifications:
 - 1. Authorized Visitor: Representatives of any regulatory or other agency having jurisdiction over the project.

1.11 REQUIREMENTS AND QUALIFICATIONS

- A. Minimum Experience: The Contractor shall have a minimum of 3 years experience with removal of hazardous materials, as evidenced through participation in at least three projects of comparable complexity to this project.
- B. Experience and Training: All personnel shall at a minimum receive information and training with regards to the hazardous materials in these specifications, as per OSHA 29 CFR, 1910.1200(h). Additional training requirements are as follows:
 - 1. Workers shall have appropriate training for lead exposure, as specified by OSHA in Lead Exposure in Construction (29 CFR Part 1926).
 - 2. Workers shall have NYSDOL asbestos worker certifications unless asbestos abatement is not required or has been completed prior to hazardous material removals. Proof of such experience shall be submitted upon request by the Owner. Improperly trained, untrained or inexperienced personnel shall not be allowed in the work area(s). Personnel shall meet minimum training and experience requirements outlined in this Section.
 - 3. All workers engaged in the removal of hazardous waste shall be 40-hour OSHA hazardous waste training per OSHA 29 CFR 1910.120(e)(3).

1.12 TESTING AND INSPECTION REQUIREMENTS AND RESPONSIBILITIES

- A. Visual inspections will be performed by the Owner or Engineer during and after removal of hazardous materials to document compliance with these specifications.

1.13 QUALITY ASSURANCE

A. Qualifications

1. Companies specializing in performing the Work of this Section shall have a minimum of 3 years experience and shall have worked on 3 projects of similar size.
2. The work shall be performed by OSHA-certified workers, who are experienced in handling petroleum-contaminated material, hazardous materials and hazardous wastes.

B. Regulatory Requirements

1. Work of this Section shall conform to all requirements of all applicable regulations of governmental authorities having jurisdiction, including safety, health and anti-pollution regulations. Where more severe requirements than those contained in the Building Code or other applicable regulations are given in this Section, the requirements of this Section shall govern.
2. Work outside the street line shall conform to the requirements of the governmental authorities or utilities having jurisdiction (e.g., DOT, DEC, etc.). Where more severe requirements than those contained in the applicable regulations are given in this Section, the requirements of this Section shall govern.
3. The Contractor shall conform to the requirements of OSHA's Hazardous Waste Operations and Emergency Response, as required.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 PROTECTION

- A. All Contractor personnel shall wear personal protective equipment and protective clothing consistent with the level of protection required for this work as specified by OSHA and the site-specific health and safety plan.
- B. The Contractor shall be responsible for the safety of its operation, and for any damage that may result from the Contractor's work. Erect and properly maintain

CONTRACT NO. 22-522
DIVISION 2 – EXISTING CONDITIONS

at all times, as required by the conditions and progress of the work, proper safeguards for the protection of workers and the public and post danger warnings as required by law or otherwise required by the Contract Documents regarding hazards created by the Contractor's operation. Furnish, install and remove after completion of the work, all signs, lights, barricades, fencing and other equipment as may be necessary for the safe execution of the Work.

3.2 DISPOSAL OF HAZARDOUS WASTES

- A. Description of Work: All hazardous wastes (as defined in 40 CFR 261 and 6 NYCRR 371) shall be transported to an off-site disposal facility meeting the requirements of 40 CFR 264.
1. Hazardous Wastes: The Contractor shall stage hazardous wastes at the site pending off-site disposal for no longer than 90 days from the date of generation. The Contractor shall contract with an approved off-site disposal facility meeting the requirements of 40 CFR 264 or 6 NYCRR 373. The Contractor shall provide the Owner with original copies of all manifests, weigh tickets and original invoices.

++ END OF SECTION ++

EXHIBIT A

LIST OF HAZARDOUS MATERIALS ⁽¹⁾

SUMMARY OF SUSPECT PCB-CONTAINING ITEMS		
Waste Type	Location	Approximate Quantity
Ballasts	Tower Road Backflow Preventor Building	4

SUMMARY OF UNIVERSAL WASTE		
Waste Type	Location	Approximate Quantity
Fluorescent Bulbs	Tower Road Backflow Preventor Building	8

1. Reference: Hazardous Materials Assessment Report.

NO TEXT ON THIS PAGE

SECTION 03 11 00
CONCRETE FORMWORK

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 013300, Submittals
- B. Section 017400, Construction Waste Management
- C. Section 032100, Steel Concrete Reinforcement
- D. Section 033000, Cast-In-Place Concrete

1.2 REFERENCES

- A. Except as shown or specified otherwise, the Work of this Section shall conform to the requirements of Specifications for Structural Concrete for Buildings ACI 301-16 of the American Concrete Institute.

1.3 DESIGN REQUIREMENTS

- A. The formwork shall be designed for loads, lateral pressure, and allowable stresses outlined in Chapter 4 - Design of "Guide to Formwork for Concrete" (ACI 347-14).

1.4 SUBMITTALS

- A. Product Data: Manufacturer's catalog sheets, specifications, and installation/application instructions for the following:
 - 1. Form systems and ties.
 - 2. Textured (architectural) form linings.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chamfer Strips: Wood, metal, PVC or rubber; 1-inch chamfer, unless otherwise indicated on the Drawings.

PART 3 - EXECUTION

3.1 PREPARATION OF FORM SURFACES

- A. Apply form-coating material in accordance with manufacturer's instructions.

3.2 INSTALLATION

- A. Provide chamfer on all exposed external corners of concrete.
- B. Provisions for Work of Related Contracts: Provide openings in concrete formwork to accommodate Work of related contracts. Obtain information for size and location of openings, recesses and chases from contractor requiring such items.
- C. Shores and Supports:
 - 1. Concrete members subject to additional loads during construction shall be shored in such a manner as will protect the member from damage by the loads.
 - 2. Do not remove shores until the member supported has acquired sufficient strength to safely support its weight and any weight imposed thereon.

3.3 REMOVAL OF FORMS

- A. Forms and shoring used to support the weight of concrete in beams, slabs and other structural members shall be removed in accordance with recommendations in paragraph 3.2.5 of "Recommended Practice for Concrete Formwork" (ACI 347-14).
- B. All formwork shall be removed after the concrete has sufficiently hardened, except in inaccessible spaces where approved.
- C. After the ends or end fasteners of form ties have been removed, the embedded portion of the ties shall terminate not less than 3/4 inch from the formed surfaces of concrete.

3.4 RE-USE OF FORMS

- A. Split, frayed, delaminated or otherwise damaged form facing material shall not be used.

++ END OF SECTION ++

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall provide labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install concrete reinforcing.
2. Extent of concrete reinforcing is shown and indicated in the Contract Documents.
3. Work includes fabrication and placement of reinforcing including bars, ties, and supports, and welded wire fabric for concrete, encasements, and fireproofing.

B. Related Sections:

1. Section 01 33 00, Submittal Procedures
2. Section 01 74 00, Cleaning and Waste Management
3. Section 04 20 00, Unit Masonry Construction.

1.2 REFERENCES

A. Standards referenced in this Section are:

1. ACI 301, Specifications for Structural Concrete.
2. ACI 315, Details and Detailing of Concrete Reinforcement.
3. ACI 350.5, Specifications for Environmental Concrete Structures.
4. ANSI B212.15, Cutting Tools – Carbide-tipped Masonry Drills and Blanks for Carbide-tipped Masonry Drills.
5. ANSI/AWS D1.4, Structural Welding Code - Reinforcing Steel.
6. ASTM A82, Specification for Steel Wire, Plain, for Concrete Reinforcement.
7. ASTM A185, Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

8. ASTM A615, Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
9. ASTM A706, Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement.
10. ASTM A767, Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement.
11. ASTM A775, Specification for Epoxy-Coated Steel Reinforcing Bars.
12. ASTM E329, Specification for Agencies Engaged in Construction Inspection and/or Testing.
13. Concrete Reinforcing Steel Institute (CRSI), CRSI 1MSP, Manual of Standard Practice.
14. ASTM E488, Test Methods for Strength of Anchors in Concrete and Masonry Elements.
15. ICC Evaluation Service (ES) AC 308, Acceptance Criteria for Post-Installed Anchors in Concrete Elements.

1.3 QUALITY ASSURANCE

A. Qualifications:

1. Testing Laboratory: Shall meet requirements of ASTM E329 and shall have experience in the testing welded splices of reinforcing steel and tension testing of reinforcing bars set in adhesive in hardened concrete.
2. Installer of Adhesive Dowels: Shall be experienced and certified by manufacturer of adhesive as possessing necessary training for installing manufacturer's products. Distributors or manufacturer's representatives shall not provide product training unless qualified as certified trainers by anchor manufacturer.

1.4 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings:
 - a. Drawings for fabricating, bending, and placing concrete reinforcing. Comply with ACI 301 and ACI 350.5.
 - b. For walls, show elevations at minimum scale of 1/4-inch to one foot.

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

- 1) Elevations shall show all openings and reference details that identify additional reinforcing required around each opening.
 - 2) Elevations shall denote each wall intersection and reference a detail that identifies additional reinforcing required at wall intersection. As an alternate to providing separate details for each wall intersection, provide overall plan detailing only the additional wall intersection reinforcing for each wall intersection.
- c. For slabs and mats, show top and bottom reinforcing on separate plan views.
- 1) Plans shall show all openings and shall reference details that identify additional reinforcing around each opening.
- d. Show bar schedules, stirrup spacing, diagrams of bent bars, location of bar splices, length of lap splices, arrangements, and assemblies, as required for fabricating and placing concrete reinforcing unless otherwise noted.
- e. Provide plans and elevations detailing location, spacing, and lengths of masonry wall dowels, where masonry is required. Coordinate location of dowels with masonry openings and with standard modular spacing. Submit masonry wall dowels with reinforcing submittal for element into which masonry dowel will be embedded. Coordinate with Section 042000, Unit Masonry Construction.
- f. Splices shall be kept to a minimum. For slabs and beams, when splices are required, locate splices in bottom bars within 1/3 span from supports and for top bars locate splices in the middle 1/3 of the span.
- g. Drawings detailing location of all construction and expansion joints, shall be submitted and approved before Shop Drawings for reinforcing are submitted.
- h. Drawings detailing location, spacing, edge distance, and embedment depth of adhesive dowels. Adhesive system shall be submitted and approved before Shop Drawings with adhesive dowels are submitted.
2. Product Data:
- a. Manufacturer's product data for adhesive, if not submitted under other Sections.

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

- b. Adhesive manufacturer's test data and ICC ES report to verify specified capacity of adhesive dowels.
 - B. Informational Submittals: Submit the following:
 - 1. Certificates:
 - a. Steel manufacturer's certificates of mill analysis, tensile, and bend tests for reinforcing steel.
 - b. Certification of welders and weld procedures for splices.
 - c. Adhesive manufacturer's certification verifying that installer is qualified and using proper installation procedures.
 - 2. Manufacturer's Instructions:
 - a. Installation instructions for adhesive systems.
 - 3. Field Quality Control Submittals:
 - a. Reports of all field quality control testing, where applicable.
 - b. Results of required inspection of welded splices of reinforcing bars.
 - c. Results of required tensile testing of adhesive dowels. Include size and location of bars tested.
 - 4. Special Procedure Submittals; Description of reinforcing weld locations and weld procedures.
- 1.5 DELIVERY, HANDLING, AND STORAGE
- A. Deliver concrete reinforcing products to Site bundled, tagged, and marked. Use metal tags indicating bar size, lengths, and other information corresponding to markings on approved Shop Drawings.
 - B. Store concrete reinforcing products to prevent damage and accumulation of dirt and excessive rust. Store on heavy wood blocking so that reinforcing does not come into contact with the ground.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Reinforcing Bars: Shall be deformed in accordance with ASTM A615, and as follows:
 - 1. Provide Grade 60 for all bars, unless indicated otherwise.

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

2. Epoxy-coated reinforcing bars, where required, shall be in accordance with ASTM A775.
 3. Galvanized reinforcing bars, where required, shall be in accordance with ASTM A767.
- B. Mechanical Couplers: Reinforcement bars may be spliced with mechanical connection upon approval by the Engineer. Connection shall be full mechanical connection that shall develop in tension or compression, as required, at least 125 percent of specified yield strength (fy) of bar. Where splices at the face of wall are shown or approved by Engineer, form saver-type mechanical couplers may be used. Form-saver couplers shall have integral plates designed to positively connect coupler to formwork.
- C. Steel Wire: Shall be in accordance with ASTM A82.
- D. Welded Smooth Wire Fabric: Shall be in accordance with ASTM A185.
1. Furnish in flat sheets, not rolls.
- E. Column Spirals: Hot-rolled rods for spirals, conforming to ASTM A615.
- F. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcing in place.
1. Use wire bar type supports complying with CRSI 1 MSP recommendations, except as specified in this Section. Do not use wood, brick, or other unacceptable materials.
 2. For slabs on grade, use precast concrete blocks, four inches square in plan, with embedded tie wire as specified by CRSI 1 MSP. Precast concrete blocks shall have same or higher compressive strength as specified for concrete in which they are located.
 3. For concrete surfaces where legs of supports are in contact with forms, provide supports complying with CRSI 1 MSP as follows:
 - a. At formed surfaces in contact with soil, weather, or liquid, or located above liquid, supports shall be CRSI Class 1 for maximum protection. Plastic coating on legs shall extend at least 0.5-inch upward from form surface. At surfaces not exposed to view or liquid, precast concrete blocks, three inches square in plan, with embedded tie wire shall be permitted. Precast concrete blocks shall have same or higher compressive strength as specified for concrete in which they are located.
 - b. At interior dry surfaces (not located above liquid), supports shall be either Class 1 or Class 2 for moderate protection.

- c. At formed surfaces with an architectural finish, use stainless steel protected legs (Type B).
 4. Over waterproof membranes, use precast concrete chairs.
 5. For epoxy-coated reinforcing, use wire reinforcing supports coated with dielectric material including epoxy or another polymer for minimum distance of two inches from point of contact with epoxy-coated reinforcement.
- G. Adhesive Dowels:
1. Dowels:
 - a. Dowel reinforcing bars shall be deformed in accordance with ASTM A615, Grade 60.
 2. Adhesive:
 - a. Requirements for adhesive are specified in drawings.

2.2 FABRICATION

- A. General: Fabricate reinforcing bars to conform to required shapes and dimensions, with fabrication tolerances complying with ACI 301, ACI 315 and ACI 350.5. In case of fabricating errors, do not re-bend or straighten reinforcing in manner that injures or weakens material.
- B. Unacceptable Materials: Reinforcing with one or more of the following defects is not allowed:
 1. Bar lengths, bends, and other dimensions exceeding specified fabrication tolerances.
 2. Bends or kinks not shown on approved Shop Drawings.
 3. Bars that do not meet or exceed their ASTM specification requirements when hand-wire-brushed, with respect to cross section, nominal weight, or average height of deformations.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine the substrate and conditions under which concrete reinforcing is to be placed and notify Engineer in writing of unsatisfactory conditions. Do not proceed with Work until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with applicable requirements of Laws and Regulations, applicable standards, and ACI 301, ACI 315 and ACI 350.5 for details and methods of reinforcing placement and supports.
- B. Clean reinforcing to remove loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.
- C. Position, support, and secure reinforcing against displacement during formwork construction and concrete placing. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
 - 1. Place reinforcing to obtain minimum concrete coverages specified in the Contract Documents. Arrange, space, and securely tie bars and bar supports together with 16-gage galvanized wire to hold reinforcing accurately in position during concrete placing. Set wire ties so that twisted ends are directed away from exposed concrete surfaces.
 - 2. Prior to placing concrete, using surveyor's level or string line, demonstrate to Engineer that specified cover of reinforcing has been attained.
 - 3. Do not secure reinforcing steel to forms with wire, nails, or other ferrous metal. Metal supports subject to corrosion shall not touch formed or exposed concrete surfaces.
- D. Allowable Placing Tolerances: Comply with ACI 301, ACI 315 and ACI 350.5, except as specified in this Section:
 - 1. Concrete surfaces in contact with liquid shall have minimum of two inches of concrete over reinforcing steel.
- E. Provide sufficient number of supports of strength required to carry reinforcing. Do not place reinforcing bars more than two inches beyond last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.
- F. Lap Splices:
 - 1. Provide standard reinforcing splices by lapping ends, placing bars in contact, and tying tightly with wire. Comply with requirements shown for minimum lap of spliced bars as shown on the Drawings.
- G. Install welded wire fabric in lengths as long as practical. Lap adjoining pieces at least one full mesh and lace splices with 16-gage wire. Do not make end laps midway between supporting beams, or directly over beams of continuous structures. Offset end laps in adjacent widths to prevent continuous laps.

H. Mechanical Couplers:

1. Mechanical butt splices shall be in accordance with recommendations of mechanical splicing device manufacturer. Butt splices shall develop 125 percent of specified minimum yield tensile strength of spliced bars or of smaller bar in transition splices. Bars shall be flame-dried before butt splicing. Provide adequate jigs and clamps or other devices to support, align, and hold longitudinal centerline of bars being butt spliced in straight line.

I. Welded Splices:

1. When field welding of reinforcing is required on the Drawings or allowed by Engineer in writing, welding of reinforcing bars shall conform to ANSI/AWS D1.4. Preheating and rate of cooling requirements shall be based on bar steel chemistry and ANSI/AWS D1.4. Welded splices shall be sized and constructed to transfer minimum of 125 percent of specified minimum yield tensile strength of spliced bars or of smaller bar in transition splices. Unless otherwise allowed by ENGINEER in writing, welding of crossing bars (tack welding) for assembly of reinforcement is prohibited.
2. Welding of wire to wire, and of wire or welded wire fabric to reinforcing bars or structural steels, shall conform to applicable provisions of ANSI/AWS D1.4 and Engineer's requirements for the particular application.
3. After completing welding on coated reinforcing bars, repair coating damage as specified in this Section. Welds and steel splice members, when used to splice bars, shall be coated with same material used for repair of coating damage.

J. Adhesive Dowels:

1. Comply with manufacturer's written installation instructions and requirements of this Section.
2. Drill holes to adhesive system manufacturer's recommended drill bit diameter and to specified depth. Drill holes in hammering and rotation mode with carbide-tipped drill bits complying with tolerances indicated in ANSI B212.15. Core-drilled holes shall not be permitted.
3. Before setting adhesive dowel, hole shall be made free of dust and debris by method recommended by adhesive system manufacturer. Brush the hole with adhesive system manufacturer-approved brush and blow hole clean with clean, dry, oil-free compressed air to remove dust and loose particles. Hole shall be dry as defined by adhesive system manufacturer.

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

4. Before injecting adhesive, obtain Engineer's concurrence that hole is dry and free of oil and other contaminants.
5. Prior to injecting adhesive into the drilled hole, dispense to an appropriate location for waste an initial amount of adhesive from the mixing nozzle until adhesive is a uniform color, indicating that product is properly mixed.
6. Inject adhesive into hole through injection system-mixing nozzle and extension tubes (as required) placed to bottom of hole. Withdraw nozzle's discharge end as adhesive is placed while keeping nozzle immersed to prevent formation of air pockets. Fill hole to depth that ensures that excess material is expelled from hole during dowel placing.
7. Twist dowel during insertion into partially-filled hole to ensure full wetting of rod surface with adhesive. Insert rod slowly to avoid developing air pockets.
8. Provide adequate curing in accordance to adhesive system manufacturer's requirements prior to continuing with adjoining or adjacent Work that could impose or impart load on the dowels. Do not begin adjoining or adjacent Work until dowels are successfully tested or when approved by Engineer.
9. Limitations:
 - a. Installation Temperature: Comply with manufacturer's instructions for installation temperature requirements. Provide temporary protection and other measures, such as heated enclosures, necessary to ensure that base material temperature complies with requirements of adhesive systems manufacturer during installation and adhesive system curing.
 - b. Oversized Holes: Advise Engineer immediately if size of drilled hole is larger than recommended by adhesive system manufacturer. Cost of corrective measures, including but not limited to redesign of dowels due to decreased capacities, shall be paid by Contractor.

3.3 FIELD QUALITY CONTROL

A. Site Inspections and Tests:

1. General:

- a. Do not place concrete until reinforcing is inspected, and permission for placing concrete is granted by Engineer. Concrete placed in violation of this provision will be rejected.
- b. Do not close up formwork for walls and other vertical members until reinforcing is inspected, and permission for placing concrete is

granted by Engineer. Concrete placed in violation of this provision will be rejected.

- c. Correct defective Work by removing and replacing or correcting, as required by Engineer.
- d. Contractor shall pay cost of corrections and subsequent testing required to confirm integrity of post-installed anchors.
- e. Owner's testing laboratory will submit test results to Contractor and Engineer within 24 hours of completion of test.

2. Site Tests:

- a. Contractor will retain the services of an approved independent testing laboratory to perform field quality testing of adhesive dowels at the Site.

- 1) Testing shall comply with ASTM E488.
- 2) Test at least ten percent of each type of adhesive dowel. If one or more dowels fail the test, Contractor shall pay cost to test all dowels of same diameter and type installed.
- 3) Test dowels to 60 percent of specified yield strength. Engineer will direct which dowels are to be tested.
- 4) Apply test loads with hydraulic ram.
- 5) Displacement of dowels shall not exceed $D/10$, where D is nominal diameter of dowel.

- 3. Inspection of Welded Splices: Owner will employ testing laboratory to perform field quality control testing of welded splices. All welded splices shall be visually inspected. Radiographically test minimum of five percent of butt splice welds. Repair defective welds so that welds are completely sound.

B. Manufacturer's Services:

- 1. Provide qualified adhesive manufacturer's representative at the Site during initial installation of adhesive dowel systems to train installing personnel in proper selection and installation procedures. Manufacturer's representative shall observe to verify that installer demonstrates proper installation procedures for adhesive dowels and adhesive material. Each installer shall be certified in writing by manufacturer as qualified to install adhesive anchors.

++ END OF SECTION ++

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01 33 00, Submittal Procedures
- B. Section 01 74 00. Cleaning and Waste Management
- C. Section 03 11 00, Concrete Formwork
- D. Section 03 20 00, Concrete Reinforcing
- E. Section 07 26 13, Vapor Retarder Under Slabs on Grade

1.2 REFERENCES

- A. Except as shown or specified otherwise, the Work of this Section shall conform to the requirements of American Concrete Institute (ACI) and American Society for Testing and Materials (ASTM) documents.
 - 1. ACI 301-05: Specification for Structural Concrete for Buildings.
 - 2. ACI 302.1R-04: Guide for Concrete Floor and Slab Construction.
 - 3. ACI 302.2R-06: Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
 - 4. ACI 304.2R-96: Placing Concrete by Pumping Methods.
 - 5. ACI 305R-10: Hot Weather Concreting.
 - 6. ACI 306R-10: Cold Weather Concreting.
 - 7. ACI 308.1-11: Standard Specification for Curing Concrete.
 - 8. ACI 318 -05 Building Code Requirements for Structural Concrete.
 - 9. ASTM C 94/C 94M – 11b: Standard Specification for Ready- Mixed Concrete.
 - 10. ASTM C 494/C 494M - 11: Standard Specification for Chemical Admixtures for Concrete.

11. ASTM F 710- 11: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
12. ASTM C 311, Standard Methods of Sampling and Testing Fly Ash and Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete.
13. ASTM C 989, Ground Granulated Blast-Furnace Slag for Use in Concrete Mortars.
14. Standard Practice ACI 226.R1, Ground Granulated Blast-Furnace Slag as a Cementitious Constituent in Concrete.

1.3 DEFINITIONS

A. ACI 301, Section 1.2 - Definitions:

1. Add the following definitions:
 - a. Cementitious Material: Cementitious materials include cement, ground blast furnace slag and fly ash.
 - b. Corrosion Inhibitor Admixture: A liquid admixture, calcium nitrite that inhibits corrosion of concrete-embedded steel in the presence of chloride ions.
 - c. Pumped Concrete: Concrete that is conveyed by pumping pressure through rigid pipe or flexible hose.
 - d. Water-to-Cementitious Ratio (w/c): A ratio representing quantity in pounds of free moisture available for cement hydration divided by quantity of cementitious materials in pounds per cubic yard concrete.

1.4 SUBMITTALS

- A. Submittals Package: Submit product data for design mix(es) and materials for concrete specified below at the same time as a package.
- B. Product Data:
 1. Mix Design: Submit proposed concrete design mix(es) together with name and location of batching plant at least 28 days prior to the start of concrete work.

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

- a. Include test results of proposed concrete proportions based on previous field experience or laboratory trial batches in accordance with ACI 301, Section 4.
 - b. Pumped Concrete: Include test results of proposed design mix(es) tested under actual field conditions with the maximum horizontal run and vertical lift required for this project.
2. Portland Cement: Brand and manufacturer's name.
 3. Fly Ash: Name and location of source, and DOT test numbers.
 4. Air-entraining Admixture: Brand and manufacturer's name.
 5. Water-reducing Admixture: Brand and manufacturer's name.
 6. High Range Water-reducing Admixture (Superplasticizer): Brand and manufacturer's name.
 7. Corrosion Inhibitor Admixture: Brand and manufacturer's name.
 8. Accelerating Admixture: Brand and manufacturer's name.
 9. Aggregates: Name and location of source, and DOT test numbers.
 10. Lightweight Coarse Aggregates: Brand and manufacturer's name.
 11. Chemical Hardener (Dustproofing): Brand and manufacturer's name, and application instructions.
 12. Chemical Curing and Anti-Spalling Compound: Brand and manufacturer's name, and application instructions.
 13. Bonding Agent (Adhesive): Brand and manufacturer's name, and preparation and application instructions.
 14. Expansion Joint Fillers: Brand and manufacturer's name.
 15. Waterstop: Brand and manufacturer's name, and installation instructions.
- C. Quality Control Submittals:
1. Batching Plant Records: At the end of each day of placing concrete, furnish the Director's Representative with a legible copy of all batch records for the concrete placed.
 2. Concrete Pumping Equipment Data: Include manufacturer's name and model of principal components, type of pump, and type and diameter of pipe/hose.

3. Minutes of the previous pre-installation conference.

1.5 QUALITY ASSURANCE

- A. Qualifications of Crew Pumping Concrete: Workers pumping concrete shall have had at least one year of experience pumping concrete.
- B. Concrete batching plants shall be currently approved as concrete suppliers by the New York State Department of Transportation.
- C. Truck mixers for concrete shall be currently approved by the New York State Department of Transportation.
- D. Pumping equipment for pumped concrete shall be subject to the approval of the Director.
- E. Fly ash supplier shall be on the New York State Department of Transportation's current "Approved List of Suppliers of Fly Ash".
- F. Source Quality Control: The Director reserves the right to inspect and approve the following items, at his own discretion, either with his own forces or with a designated inspection agency:
 1. Batching and mixing facilities and equipment.
 2. Sources of materials.
- G. ACI 301, Section 1.3 Reference standards and cited publications:
 1. Add the following to the list of ASTM Standards:
 - a. C 311-11a Standard Methods of Sampling and Testing Fly Ash or Natural Pozzolans For Use as A Mineral Admixture in Portland Cement Concrete.

1.6 DELIVERY

- A. ASTM C 94/C 94M, Article 14 - Batch Ticket Information: In addition to the information required by Paragraph 14.1, also include the following:
 1. Type and brand, and amount of cement.
 2. Weights of fine and coarse aggregates.
 3. Class and brand, and amount of fly ash (if any).

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cement: ASTM C 150, Type II Portland cement.
- B. Water: Potable
- C. Air-entraining Admixture: ASTM C 260, and on the New York State Department of Transportation's current "Approved List".
- D. Water-reducing Admixture: ASTM C 494/C 494M, Type A, and on the New York State Department of Transportation's current "Approved List".
- E. High Range Water-reducing Admixture (Superplasticizer): ASTM C 494/C 494M, Type F, and on the New York State Department of Transportation's current "Approved List".
- F. Corrosion-Inhibiting Admixture: ASTM C 494/C 494M, for use in resisting corrosion of steel reinforcement.
 - 1. DCI Corrosion Inhibitor by W. R. Grace & Co., - Conn., 62 Whittemore Ave., Cambridge, MA 02140, (617) 876-1400 and Rheocrete CNI by Master Builders/ BASF Building Systems, 23700 Chagrin Blvd., Cleveland, OH 44122, (800) 628-9990.
 - 2. DCI - S Corrosion Inhibitor by W. R. Grace & Co., - Conn., 62 Whittemore Ave., Cambridge, MA 02140, (617) 876-1400.
- G. Retarding Admixture: ASTM C 494, Type D, Water-reducing and retarding, for use in hot weather concreting, and on the New York State Department of Transportation's current "Approved List".
- H. Accelerating Admixture: Non-corrosive admixture, containing no chloride, complying with ASTM C 494, Type C or E, and on the New York State Department of Transportation's current "Approved List".
- I. Fly Ash: ASTM C 618, including Table 1 (except for footnote A), Class F except that loss on ignition shall not exceed 4.0 percent.
- J. ACI 301, Section 4.2.1.2 - Aggregates:
 - 1. Add the following paragraph:
 - a. Fine aggregate for pumped concrete shall meet the requirements of ASTM C 33, except 15 to 30 percent shall pass the No. 50 sieve and 5 to 10 percent shall pass the No. 100 sieve. The fineness modulus

of the fine aggregate for pumped concrete shall not vary more than 0.20 from the average value used in proportioning.

- K. Moisture-Retaining Cover: Waterproof paper, polyethylene film, or polyethylene-coated burlap complying with ASTM C 171.
- L. Chemical Curing and Anti-Spalling Compound: ASTM C-309, Type 1D, Class B, with a minimum 18 percent total solids content. No thinning of material allowed.
 - 1. SureCure Emulsion, Kaufman Products, Inc. 3811 Curtis Avenue, Baltimore, MD 21226, (800) 637-6372.
 - 2. Cure & Seal by Symons Corp., 200 East Touhy Ave., PO Box 5018, Des Plaines, IL 60017-5018, (847) 298-3200.
 - 3. Kure-N-Seal by Sonneborn/ BASF Building Systems, 889 Valley Park Dr., Shakopee, MN 55379, (800) 433-9517.
 - 4. Day-Chem Cure & Seal UV 26 percent (J-22 UV) by Dayton Superior Corp., 721 Richard St., Miamisburg, OH 45342, (800) 745-3700.
 - 5. Acrylseal HS by Master Builders/ BASF Building Systems, 23700 Chagrin Blvd., Cleveland, OH 44122, (800) 628-9990.
- M. Chemical Hardener (Dustproofing): Colorless aqueous solution of magnesium-zinc fluosilicate.
 - 1. Lapidolith by Sonneborn/ BASF Building Systems, 889 Valley Park Dr., Shakopee, MN 55379, (800) 433-9517.
 - 2. Surfhard by The Euclid Chemical Co., 19218 Redwood Rd., Cleveland, OH 44110, (216) 531-9222.
 - 3. Pena-Lith by W.R. Meadows, Inc., PO Box 543, Elgin, IL 60121, (847) 683-4500.
 - 4. FluoHard by L & M Construction Chemicals, Inc., 14851 Calhoun Rd., Omaha, NE 68152, (402) 453-6600.
 - 5. Armortop by Anti Hydro International, Inc., 265 Badger Ave., Newark, NJ 07108, (800) 777-1773.
 - 6. Diamond by Kaufman Products, Inc., 3811 Curtis Avenue, Baltimore, MD 21226, (800) 637-6372.
- N. Type 1 Expansion Joint Filler: Preformed, resilient, nonextruding cork units complying with ASTM D 1752, Type II.

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

- O. Epoxy Bonding Agent (Adhesive): 100 percent solids epoxy-resin-base bonding compound, complying with ASTM C 881, Types I, II, IV and V, Grade 2 (horizontal areas) or Grade 3 (overhead/vertical areas), and Class B (40-60 degrees Fahrenheit) or Class C (60 degree Fahrenheit and above).
1. SurePoxy HM Series by Kaufman Products, Inc., 3811 Curtis Avenue, Baltimore, MD 21226, (800) 637-6372.
 2. Sikadur Hi-Mod 32 by Sika Corporation, 201 Polito Avenue, Lyndhurst, NJ 07071, (800) 933-7452.
 3. Epogrip by Sonneborn/-BASF Building Systems, 889 Valley Park Drive, Shakopee, MN 55379, (800) 433-9517.
- P. Waterstop: Extruded from virgin polyvinyl chloride plastic compound containing no scrap or reclaimed material or pigment.
1. Size: Minimum 6 inches wide by 3/8 inch thick, unless otherwise indicated.
 2. Minimum Tensile Strength (ASTM D 412): 2000 psi.
 3. Minimum Ultimate Elongation (ASTM D 412): 350 percent.
 4. Shore A/10 Durometer Hardness (ASTM D 2240): Minimum 65; Maximum 83.
 5. Maximum 24 Hour Water Absorption (ASTM D 570): 0.15.
- Q. Expansion Joint Dowels: Smooth steel expansion joint dowel with minimum 5 inch long steel dowel cap, unless otherwise indicated.

2.2 PROPORTIONING OF MIXES

- A. Cast-in-place concrete shall be air-entrained normal weight concrete.
1. Normal weight concrete, except as otherwise specified, shall have a minimum compressive strength of 4000 psi. Slump: Maximum 4 inches; minimum 2 inches before the addition of any water-reducing admixtures or high-range water-reducing admixtures (superplasticizers) at the Site.
 2. Normal weight concrete for garage floors, and for exterior slabs, ramps and stairs shall have a minimum compressive strength of 4000 psi, with a minimum of 611 pounds of cement per cubic yard. Slump: Maximum 3 inches; minimum 2 inches before the addition of any water-reducing admixtures or high-range water-reducing admixtures (superplasticizers) at the Site.

3. Optional Material: Fly ash may be substituted for (Portland) cement in normal weight and lightweight concrete up to a maximum of 15 percent by weight of the required minimum (Portland) cement. If fly ash is incorporated in a concrete design mix, make necessary adjustments to the design mix to compensate for the use of fly ash as a partial replacement for (Portland) cement.
 - a. Adjustments shall include the required increase in air-entraining admixture to provide the specified air content.
 - b. Lower early strength of the concrete shall be considered in deciding when to remove formwork.
- B. Slump for Pumped Concrete: When a water-reducing admixture is not used, maximum slump shall be 4 inches. When a water-reducing admixture is used, maximum slump shall be 6 inches and when a high-range water-reducing admixture (superplasticizers) is used, maximum slump shall be 8 inches.
- C. Design Air Content: Design air content for concrete shall be 8 percent by volume, with an allowable tolerance of plus or minus 1.5 percent for total air content, except as otherwise specified. Use air-entraining admixture, not air-entrained cement.
- D. Water-Cement Ratio: Cast-in-place concrete shall have a maximum water-cement ratio of 0.45.
- E. ACI 301, Section 4.2.2.3: Change article to read as follows:
 1. 4.2.2.3 - Size of Coarse Aggregates:
 - a. 4.2.2.3.a Normal Weight Concrete: Coarse aggregates shall conform to graduation requirements for various sizes as tabulated in Table No. 2 of ASTM C 33. The sizes of coarse aggregates for various classes of Work shall be as follows with all percentages being determined by weight.
 - b. 4.2.2.3.b For concrete floors, floor and roof slabs, reinforced beams and girders, columns and piles, concrete encasing underground electric conduits, and concrete in which the space between restricting objects is 2 inches or less, the coarse aggregate shall be Size No. 67.
 - c. 4.2.2.3.c For other concrete Work having a minimum cross-sectional dimension of not more than 6 inches, the coarse aggregate shall be a well graded mixture of No. 67 and No. 57, provided that not more than 50 percent nor less than 30 percent shall be Size No. 67 and not more than 70 percent nor less than 50 percent shall be Size No. 57.

- d. 4.2.2.3.d For other concrete Work having a minimum cross-sectional dimension greater than 6 inches and not more than 12 inches, the coarse aggregate shall consist of a mixture of No. 67, No. 57 and No. 467, providing that not more than 25 percent nor less than 10 percent shall be Size No. 67 and not more than 40 percent shall be Size No. 467.
 - e. 4.2.2.3.e For other concrete Work having a minimum cross-sectional dimension of more than 12 inches, the coarse aggregate shall consist of a mixture of No. 67, No. 57 and No. 357, providing not more than 25 percent nor less than 10 percent shall be Size No. 67 and not more than 40 percent shall be Size No. 357.
- F. Application Rate for Corrosion-Inhibiting Admixture: The application rate for the corrosion-inhibiting admixture shall be four (4) gallons per cubic yard of concrete for all concrete placements where indicated on the drawings.
- G. Admixtures: Do not use admixtures in concrete unless specified or approved in writing by the Director.
- H. ACI 301, Section 4.1.2.1 - Mixture Proportions:
- 1. Add the following to paragraph 4.1.2.1:
 - a. Proposed design mix(es) for pumped concrete and the pumping equipment shall have been tested under actual field conditions with the maximum horizontal run and vertical lift required for this project.

2.3 JOINTS

- A. ACI 301, Section 5.3.2.6 - Construction joints and other bonded joints:
- 1. Delete the following subparagraphs:
 - a. Use an acceptable adhesive applied in accordance with the manufacturer's recommendations;
 - b. Use an acceptable surface retarder in accordance with manufacturer's recommendations;
 - c. Roughen the surface in an acceptable manner that exposes the aggregate uniformly and does not leave laitance, loosened particles of aggregate, or damaged concrete at the surface; or
 - d. Use Portland-cement grout of the same proportions as the mortar in the concrete in an acceptable manner.

2. Add the following in place of the above subparagraph:
 - a. The use of bonding agent (adhesive).
 - b. The use of cement grout.
- B. Except as otherwise shown on the Drawings, expansion joints shall be as follows:
 1. In joints required to receive a sealant, the joint filler shall be 1/2-inch-thick and recessed as required to form a caulking slot.
 2. In joints not required to receive a sealant, the joint filler shall be 1/2-inch-thick and extend through the full cross-section of the concrete.
 3. Tool edges of concrete with 1/8-inch radius edging tool.

2.4 PRODUCTION OF CONCRETE

- A. Provide ready-mixed concrete, either central-mixed or truck-mixed, unless otherwise approved in writing by the Director.
- B. Provide adequate controls to ensure that the temperature of the concrete when placed does not exceed 90 degrees F., and make every effort to place it at a lower temperature. The temperature of the concrete as placed shall not be so high as to cause difficulty from loss of slump, flash set or cold joints. Ingredients may be cooled before mixing by shading the aggregates, fog spraying the coarse aggregate, chilling the mixing water or other approved means. Mixing water may be chilled with flake ice or well-crushed ice of a size that will melt completely during mixing, providing the water equivalent of the ice is calculated into the total amount of mixing water.
- C. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement and curing.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Do not use items of aluminum for mixing, chuting, conveying, forming or finishing concrete, except magnesium alloy tools may be used for finishing.
- B. Check items of aluminum required to be embedded in the concrete and ensure that they are coated, painted or otherwise isolated in an approved manner.
- C. Install waterstops in accordance with manufacturer's printed instructions.

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

- D. Hardened concrete, reinforcement, forms, and earth which will be in contact with fresh concrete shall be free from frost at the time of concrete placement.
- E. Do not deposit concrete in water. Keep excavations free of water by pumping or by other approved methods.
- F. Prior to placement of concrete, remove all hardened concrete spillage and foreign materials from the space to be occupied by the concrete.
- G. Prior to placement of a concrete slab-on-grade, ensure roof is watertight and install polyethylene or other preventative measures to mitigate exposure to external moisture sources such as rainwater; runoff from adjacent slopes; landscaping water; water from curing; or wet grinding, sawing, and cleaning.
- H. Place vapor barrier directly under concrete slab-on-grade with no cushion or blotter layer.

3.2 ADMIXTURE ADDITIONS AT THE SITE

- A. Site additions shall be limited to high-range water-reducers, non-chloride accelerators, and corrosion inhibitors. Comply with manufacturers' printed instructions for discharge of admixtures shall be furnished.
- B. High-Range Water-Reducers:
 - 1. Concrete shall arrive at a slump of 2 to 4 inches (50 to 100 mm). Water additions at the Site shall be limited to comply with water-to-cementitious ratio requirements.
 - 2. Following addition of high-range water-reduced concrete, a minimum of 70 revolutions or 5 minutes of mixing shall be completed to assure a consistent mixture.
- C. All concrete with other admixture additions shall mix a minimum of 70 revolutions or 5 minutes to assure a consistent mixture.

3.3 PLACING

- A. Conveying equipment:
 - 1. When pumping concrete, the lubricating mortar for the delivery line shall not be discharged into an area of concrete placement.
 - 2. The inside diameter of the delivery lines for pumped concrete shall be the greater of either a minimum of 5 inches or 3 times the maximum size of coarse aggregate.

- B. Operation of truck mixers and agitators and discharge limitations shall conform to the requirements of ASTM C 94.
- C. Do not allow concrete to free fall more than 4 feet.

3.4 REPAIRING SURFACE DEFECTS

- A. Finish patched areas to match the texture of the surrounding surface.
- B. The patch mixture shall consist of a mixture of dry-pack mortar, consisting of one-part Portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for placing and handling. For surfaces exposed to view, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

3.5 FINISHING FORMED SURFACES

- A. Finish Schedule: Except where indicated otherwise on the Drawings, provide the finishes below:
 - 1. Rough Form Finish for concrete surfaces not exposed to view.
 - 2. Smooth Form Finish for concrete surfaces exposed to view.
- B. Fins shall be completely removed on surfaces to receive waterproofing.

3.6 SLABS

- A. Slabs on Grade: Provide key type joints unless otherwise shown. Tool exposed joints.
- B. ACI 301, Section 5.3.4 – Finishing unformed surfaces:
 - 1. Add the following paragraph to section 5.3.4.1 Placement:
 - a. Provide monolithic finishes on concrete floors and slabs without the addition of mortar or other filler material. Finish surfaces in true planes, true to line, with particular care taken during screeding to maintain an excess of concrete in front of the screed so as to prevent low spots. Scream and darby concrete to true planes while plastic and before free water rises to the surface. Do not perform finishing operations during the time free water (bleeding) is on the surface.
- C. Finish Schedule: Except where indicated otherwise on the Drawings, provide the finishes below:

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

1. Floated Finish for:
 - a. Treads and platforms of exterior steps and stairs.
 - b. Slabs and fill over which waterproofing, roofing, vapor barrier, insulation, terrazzo, or resin bound flooring is required.
 2. Troweled Finish for:
 - a. Interior slabs that are to be exposed to view.
 - b. Slabs and fill over which resilient wood flooring, resilient tile or sheet flooring, carpet, or thin-film coating system is required.
 - c. Slabs and fill over which thin-set ceramic tile is required, except fine-broom finished surface.
 - d. Treads and platforms of interior steps and stairs.
 3. Broom or Belt Finish for:
 - a. Exterior slabs. Texture as approved by the Director's Representative.
 4. Scratched Finish for:
 - a. Surfaces to be covered with ceramic tile set in a bonded thick mortar bed, except screed to a Class B tolerance.
 - b. Surfaces to be covered with floor topping.
- D. Early-entry dry-cut saws are preferred in place of conventional wet-cut saws.
- E. Begin saw-cutting as soon as the saw will not dislodge the aggregate or ravel the edge of the saw-cut, but in no case longer than 12 hours after the slab is placed. Saw-cut a minimum of one quarter of the slab depth leaving a clean, sharp edge in the pattern shown on the Contract Documents. Provide sufficient personnel and equipment to complete saw-cutting operations within 18 hours after the slab is placed.
- F. Floor flatness and levelness tolerances: For flatness and levelness tolerances of floor slabs refer to ACI 302 Chapter 8.15. Floor surface tolerances shall be 1/8 inch over a horizontal distance of 10 feet in any direction, unless otherwise specified by floor profile quality classifications in ACI 302.
1. When flatness or levelness tolerances are not met then the floor shall be ground or scarified and repoured to meet specifications.

3.7 CURING AND PROTECTION

- A. Hot Weather Concreting: Comply with ACI 305R whenever the atmospheric temperature or the form surface temperature is at or above 90 degrees F., or climatic conditions of wind and/or low humidity will cause premature drying of the concrete.
- B. Curing Temperature: Maintain the temperature of the concrete at 50 degrees F. or above during the curing period. Keep the concrete temperature as uniform as possible and protect from rapid atmospheric temperature changes. Avoid temperature changes in concrete which exceeds 5 degrees F. in any one hour and 50 degrees F. in any 24-hour period.
- C. Curing and Moisture Mitigation for Resilient Flooring:
 - 1. Acceptable curing and drying conditions include a minimum ambient temperature of 70 degrees F and a maximum relative humidity of 50%.
 - a. Air movement at 15 mph.
 - 2. Do not cure slabs by adding water; ponding or wet burlap method.
 - 3. Do not use curing compounds or cure-and-seal materials unless such use is approved in writing by the adhesive and floor covering manufacturers. The curing product manufacturer's conformance to ASTM c 1315 is not a substitute for the adhesive and floor covering manufacturer's approval.
 - 4. Cure the slab by covering with waterproof paper, plastic sheets, or a combination of the two for 3 to 7 days.

3.8 CHEMICAL HARDENER (DUSTPROOFING)

- A. Apply chemical hardener to all troweled finished interior floors which are to be left exposed.
- B. Do not apply chemical hardener until concrete has cured the number of days recommended in manufacturer's instructions.
- C. Prepare surfaces and apply chemical hardener in accordance with manufacturer's printed instructions and recommendations.

3.9 FIELD QUALITY CONTROL

- A. Concrete construction is subject to special inspections as required by the 2015 New York State Building Code and listed in the Statement of Special Inspections.

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

- B. Strength Tests for Pumped Concrete: Prepare strength test specimens and make strength tests from concrete samples obtained at the truck discharge chute and at the end of the pump delivery line in accordance with paragraph 16.3.4.4.
- C. Make available to the Owner's Representatives whatever test samples are required to make tests. Furnish shipping boxes for compression test cylinders.
- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by the Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, at no additional cost to the State and as accepted by the Director. Laboratory test data for revised mix design and strength results must be submitted to and accepted by the Director's Representative before using in the work.
- E. Test results will be reported in writing to the Director's Representative, Ready-Mix Producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day tests.
- F. Nondestructive Testing: Impact hammer, Windsor probe, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- G. Additional Tests: The State shall make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by the Director's Representative. The testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Pay for such tests when unacceptable concrete is verified, including all inspection and Engineering fees when non-conforming work is verified.
- H. Moisture Testing: Test all slabs-on-grade for moisture content that will receive resilient flooring. For a preferred moisture testing method and limits; consult the written instructions of the floor covering manufacturer, the adhesive manufacturer, the patching/underlayment manufacturer, or combination thereof. Test repeatedly until the desired moisture content is obtained.
- I. pH Testing: Test concrete floors for pH level prior to the installation of resilient flooring. Do not exceed the recommended pH level of the resilient flooring manufacturer or the adhesive manufacturer, or both.

+ + END OF SECTION + +

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SECTION 03 34 00

CONTROLLED LOW STRENGTH MATERIAL

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Earthwork: Section 31 00 00.
- B. Cast-In-Place Concrete: Section 03 30 00.

1.2 REFERENCES

- A. Except as shown or specified otherwise, the Work of this Section shall conform to the requirements of Specifications for Structural Concrete for Buildings ACI 301-16 of the American Concrete Institute.

1.3 DEFINITIONS (AMENDMENTS TO ACI 301, CHAPTER 1):

- A. Controlled Low Strength Material (CLSM) Fill can also be called by different names including but not limited to: K-Crete, Flowable Fill, Controlled Density Fill, Flowable Fly Ash and Fly Ash Slurry.

1.4 SUBMITTALS

- A. Submittals Package: Submit product data for design mix and materials for CLSM specified below at the same time as a package.
- B. Product Data:
 - 1. CLSM design mix with name and location of batching plant.
 - 2. Portland Cement: Brand and manufacturer's name.
 - 3. Fly Ash: Name and location of source, and DOT test numbers.
 - 4. Air-entraining Admixture: Brand and manufacturer's name.
 - 5. Water-reducing Admixture: Brand and manufacturer's name.
- C. Quality Control Submittals:
 - 1. Certificates: Affidavit required under Quality Assurance Article.

1.5 QUALITY ASSURANCE

- A. Furnish and place a Controlled Low Strength Material (CLSM) as shown on plans

or as directed by the engineer, in writing. Provide CLSM containing cement and water. At the Contractor's option, it may contain fly ash, aggregate, or chemical admixtures in any proportions such that the final product will meet the strength and flow consistency requirements included in this specification.

- B. CLSM batching plant shall be currently approved as a concrete supplier by the New York State Department of Transportation and shall have a minimum of 1-year experience in the production of similar products.
- C. Fly ash supplier shall be currently approved as a fly ash supplier by the New York State Department of Transportation.
- D. Source Quality Control: The Director reserves the right to inspect and approve the following items, at his own discretion, either with his own forces or with a designated inspection agency:
 - 1. Batching and mixing facilities and equipment.
 - 2. Sources of materials.

1.6 STORAGE

- A. Store materials so as to insure the preservation of their quality and fitness for the Work. Materials, even though accepted prior to storage, are subject to inspection and shall meet the requirements of the Contract before their use in the Work.

PART 2 - PRODUCTS

2.1 MATERIALS (AMENDMENTS TO ACI 301, CHAPTER 2):

- A. Cement: ASTM C 150, Type I or II Portland cement.
- B. Water: Potable.
- C. ACI 301, Section 4,2,1,2 - Aggregates:
 - 1. Add the following paragraph:

The aggregate for CLSM shall meet the requirement of ASTM C 33, except 100% passing the ¾" sieve and a maximum of 20% passing the No. 200 sieve.
- D. Fly Ash: ASTM C 618, including Table 1A (except for footnote A), Class F except that loss on ignition shall not exceed 4.0 percent.
- E. Chemical Admixtures:

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

1. Darafill by W. R. Grace and Co., 62 Whittemore Avenue, Cambridge, MA 02140, (617) 876-1400, www.graceconstruction.com.
2. Eucon Easy Fill by the Euclid Chemical Company, 19218 Redwood Road, Cleveland, OH 44110, (800) 321-7628, www.euclidchemical.com.
3. MasterCell 25 by Master Builders Technologies, 23700 Chagrin Boulevard, Cleveland, Ohio 44122-5554, (800) 628-9990, www.masterbuilders.com.
4. Sika Lightcrete Powder, Sika Corporation, 201 Polito Avenue, Lyndhurst, NJ 07071, (201) 933-8800, www.sikaconstruction.com.

2.2 CLSM MIXTURE

- A. CLSM, Hand Tool Excavatable: Provide mix with compressive strength of 100 psi or less when measured 28 days from placement. Minimum air content at time of placement shall be 20%.
- B. In the absence of one year strength data, the cementitious content shall be a minimum of 150 lbs./cy, the minimum air content shall be 20%, and fresh unit weight shall be a maximum of 115 lbs./ft³, except where specified.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Examine conditions of substrates and other conditions under which work is to be performed and notify the Engineer, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.
- B. Keep excavations free of water. Do not deposit CLSM in water.
- C. Hardened CLSM, forms, and earth which will be in contact with fresh CLSM shall be free from frost at the time of CLSM placement.
- D. Prior to placement of CLSM, remove all foreign materials from the space to be occupied by the CLSM.

3.2 APPLICATION OF CLSM

- A. Secure tanks to prevent displacement during placement.

3.3 PROTECTION

- A. Protect CLSM from traffic until sufficient strength has been achieved for further construction operations.

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

3.4 FINISHING

- A. Provide a floated finish to the exposed portion of the CLSM.

++ END OF SECTION ++

SECTION 03 60 00

GROUTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. General:

1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.

1.2 REFERENCES

A. Standards referenced in this Section are:

1. ASTM C33 – Standard Specification for Concrete Aggregate.
2. ASTM C109 - Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch or 50 mm Cube Specimens).
3. ASTM C579 - Test Method for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacing, and Polymer Concretes.
4. ASTM C939 - Test Method for Flow of Grout for Preplaced- Aggregate Concrete (Flow Cone Method).
5. ASTM C1107 -Packaged Dry, Hydraulic Cement Grout (Non-Shrink).
6. CRD-C 621 -Corps of Engineers Specification for Non-Shrink Grout.

1.3 QUALITY ASSURANCE

A. The Testing Agency:

1. Testing of materials and of resulting grout for compliance with the technical requirements of the specification will be performed by QA/QC consultant employed and paid by the County.
 - a. The Contractor shall be charged by the County for the cost of any

additional tests and investigation on work performed which does not meet the specifications.

1.4 SUBMITTALS

- A. The Contractor shall submit Shop Drawings and material specifications for the approval of the Engineer. Shop drawings shall include, but not be limited to:
 - 1. Material certifications and technical data sheets.
 - 2. Samples of all materials to be used.
 - 3. Proposed mix proportions for cement grout.
- B. The Contractor shall also submit the following:
 - 1. Certified test results verifying the compressive strength, shrinkage and expansion requirements specified herein.
 - 2. Manufacturer's literature containing instructions and recommendations on the mixing, handling, placement and appropriate uses for each type of grout used in the work.

PART 2- PRODUCTS

2.1 MATERIALS

- A. Cement Grout
 - 1. Cement grout shall be composed of Portland cement, sand and water. The sand to be used shall be selected to suit the spacing for placement. Where sand is not usable, the grout shall be composed of cement and water only.
 - 2. Gradation of sand for cement grout shall be in accordance with ASTM C33. Cement grout shall be proportioned such that it achieves a 28-day compressive strength of 4,000 psi. The Contractor shall be responsible for developing the mix proportions.
 - a. Gradation for Natural Sand:

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

Sieve Size	Spaces less than one (1) inch	Spaces one (1) inch or more
Passing 3/8"		100
Passing # 4	100	95-100
Passing # 8	95-100	80-100
Sieve Size	Spaces less than one (1) inch	Spaces one (1) inch or more
Passing # 16	70-100	50-85
Passing # 30	40-75	25-60
Passing # 50	10-35	10-30
Passing # 100	2-15	2-10
Passing # 200	--	--

3. Water shall be kept to a minimum, the amounts noted in the preceding table are the maximum for grout. Proportioning by volume shall be limited to small quantities mixed at the job site.
4. White Portland cement shall be mixed with the Portland cement as required to match the color of adjacent concrete.

B. Non-Shrink Grout

1. The grout material shall be an approved ready to use mixture requiring only water for use at the job site. The compressive strength of 2-inch cubes shall be 3,000 psi at 7 days.
2. Non-shrink grout shall conform to CRD-C 621 and ASTM C1107, Grade B or C when tested at a maximum fluid consistency of 30 seconds per ASTM C939 at temperature extremes of 45 degrees Fahrenheit and 90 degrees Fahrenheit and an extended working time of 15 minutes.
3. Non-shrink grout product and manufacturer shall be as specified in this Section.
4. Non-shrink grouts depending on oxidation to limit shrinkage and containing additives such as iron or steel particles shall not be used.

C. Epoxy Grout

1. Epoxy grout shall be modified as required for each particular application with aggregate per manufacturer's instructions.

2. Epoxy grout product and manufacturer shall be as specified in this Section.

D. Dry Pack

1. Dry pack (to be packed or tamped in place) shall be made at no slump consistency.
2. When mixing the batch, only enough water shall be added to the dry materials to produce a rather stiff mixture, then additions of water may be made in small increments until the desired consistency is obtained.

E. Curing Materials

1. Curing materials for cement grout shall be as specified in Section 03 30 00 - Cast-in-Place Concrete and as recommended by the manufacturer for prepackaged grouts.

PART 3 - EXECUTION

3.1 IMPLEMENTATION

A. Installation

1. The consistency of grouts shall be that necessary to completely fill the space to be grouted for the particular application. Dry pack consistency shall be such that the grout is plastic and moldable but will not flow.
2. Measurements for cement grout shall be made accurately by weight or by volume using containers. All measurements shall be made in a manner satisfactory to the Engineer. Prepackaged grouts shall have ingredients measured by means recommended by the manufacturer.
3. Grout shall be placed quickly and continuously, shall completely fill the space to be grouted, be thoroughly compacted and free of air pockets. The grout may be poured in place, pressure grouted by gravity, or pumped.
4. For grouting beneath base plates, grout shall be poured from one side only and shall flow across to the open side to avoid air-entrapment.
5. The use of pneumatic pressure or dry-packed grouting requires approval of the Engineer.

3.2 FIELD TESTING / QUALITY CONTROL

A. Field Tests:

CONTRACT NO. 22-522
DIVISION 3 – CONCRETE

1. Compression test specimens will be taken during construction from the first placement of each type of grout and at intervals thereafter as selected by the Engineer to ensure continued compliance with these Specifications.
 2. Compression tests and fabrication of specimens for cement grout and non-shrink grout will be performed as specified in ASTM C109 at intervals during construction as selected by the Engineer. A set of three specimens will be made for testing at seven days, 28 days and any additional time period as appropriate.
 3. Compression tests and fabrication of specimens for epoxy grout shall be performed as specified in ASTM C579, Method B, at intervals during construction as selected by the Engineer. A set of three specimens will be made for testing at seven days and any other time period as appropriate.
- B. All grout which has already been placed and which fails to meet the requirements of this Section is subject to removal and replacement by the Contractor at no additional cost to the City

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 04 05 13

MORTAR

PART 1 - GENERAL

1.1 REFERENCES

A. Standards:

1. Mortar: ASTM C 270, except as otherwise specified.
2. Grout: ASTM C 476.

1.2 SUBMITTALS

A. Product Data:

1. Portland Cement: Brand and manufacturer's name.
2. Masonry Cement: Brand and manufacturer's name.
3. Lime: Brand and manufacturer's name.
4. Sand(s): Location of pit, name of owner, and previous test data.
5. Color Pigments: Brand and manufacturer's name.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle materials in a manner which will insure the preservation of their quality and fitness for the Work.
- B. Store cement and lime on raised platforms under waterproof, well ventilated cover.

1.4 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01 33 00, Submittals
- B. Section 01 74 00, Construction Waste Management

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cement: One of the following complying with the indicated requirements:
1. Portland Cement: ASTM C 150, Type 1, of natural color or white as required to produce the desired color.
 - a. Fly Ash: Comply with ASTM C593.
 - 1) Recycled Content: Minimum 15 percent pre-consumer recycled content at contractor's option.
 - a) Type 1: 81 g, 15 percent.
 2. Masonry Cement: ASTM C 91, of natural color or custom color as required to produce the desired color.
 - a. Fly Ash: Comply with ASTM C593.
 - 1) Recycled Content: Minimum 5 percent post-consumer recycled content, or minimum 20 percent pre-consumer recycled content at contractor's option.
 - a) Type M: 27 g, 5 percent; 108 g 20 percent.
 - b) Type S: 26 g, 5 percent; 102 g, 20 percent.
 - c) Type N: 24 g, 5 percent; 96 g 20 percent.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Mortar Sand: ASTM C 144, except that for joints less than 1/4 inch thick use sand graded with 100 percent passing the No. 16 sieve.
 1. Sand for White Mortar: Natural white sand or ground white stone.
 2. Sand for Colored Mortar: Ground marble, granite, or other sound stone, as required to match approved sample.
- D. Grout Sand: ASTM C 404.
- E. Color Pigments: High purity, finely ground, chemically inert, unfading, lime proof mineral oxides specially prepared for use in mortar.
- F. Water: Clean and free of deleterious amounts of acids, alkalis, and organic materials.

2.2 MIXES

- A. Mortar for Unit Masonry: Comply with ASTM C 270, proportion specifications, except limit materials to those specified.
 - 1. Colored Mortar: Proportion color pigments with other ingredients as necessary to match required color, except limit pigments other than carbon black to a maximum of 10 percent of cement content by weight and limit carbon black to a maximum of 3 percent of cement content by weight.
- B. Grout: Comply with ASTM C 476. If grout types are not indicated on Drawings, furnish type (fine or coarse) most suitable for the particular job conditions to completely fill cavities and embed reinforcement and other built-in items.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refer to sections of Specifications which require mortar and masonry grout.

3.2 MORTAR SCHEDULE

- A. Where mortar types are not indicated on Drawings or specified, use types as follows:
 - 1. Type M for unit masonry below grade in contact with fill materials.
 - 2. Type S for concrete masonry units.
 - 3. Type N for brick masonry units.
 - a. Proportion Portland cement, lime, and sand in a 1:1:6 ratio.

++ END OF SECTION ++

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SECTION 04 15 00
MASONRY ACCESSORIES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall furnish all labor, materials, equipment and incidentals required to provide masonry accessories as shown and specified.
2. The types of masonry accessories required include the following:
 - a. Continuous horizontal wire reinforcing and ties.
 - b. Individual metal ties.
 - c. Anchoring devices.
 - d. Concrete inserts.
 - e. Miscellaneous accessories.
3. This Section specifies the masonry accessories for Work under the following Sections:
 - a. Section 04 20 10, Unit Masonry Construction.

B. Related Work Specified Elsewhere:

1. Section 04 05 13, Mortar.
2. Section 04 20 10, Concrete Masonry Units.
3. Section 04 21 00, Brick Masonry.

1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: Wherever a fire resistance classification is shown or scheduled for unit masonry construction (4-hour, 3-hour and similar designations), provide accessories complying with the requirements established by UL and the New York State Uniform Fire Prevention and Building Code.

- B. Reference Standards: Comply with applicable provisions and recommendations of the following, except where otherwise shown or specified.
1. ASTM A 82, Cold Drawn Steel wire for Concrete Reinforcement.
 2. ASTM A 153, Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 3. ASTM A 240, Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and General Applications.
 4. ASTM A 615, Deformed and Plain Carbon Steel Bars for Concrete Reinforcement.
 5. ASTM A 1064, Carbon-Steel Wire and Welded Wire Reinforcement, Plain or Deformed, for Concrete.
 6. ASTM B 227, Hard-Drawn Copper-Clad Steel Wire.
 7. ASTM D 1752, Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
 8. UL, Design Number U907.

1.3 SUBMITTALS

- A. Manufacturer's Data: Submit for approval to Engineer copies of manufacturer's specifications and installation instructions for each masonry accessory required. Include data substantiating that materials comply with specified requirements.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials: Deliver accessories in original packages, plainly marked with identification of materials and manufacturer.
- B. Storage of Materials: Store and cover materials to prevent corrosion and deterioration.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Continuous Wire Reinforcing and Ties for Masonry: Welded wire units prefabricated in straight lengths of not less than 10 feet, with matching corner "L" and intersection "T" units. Fabricate from cold drawn steel wire complying with ASTM A 1064, with deformed continuous 9 gage side rods and plain 9 gage cross

CONTRACT NO. 22-522
DIVISION 4 – MASONRY

rods, crimped for cavity wall construction, with unit width of 1-1/2 to 2 inches less than thickness of wall or partition. All reinforcing shall be hot dipped galvanized after fabrication with 1.5 ounces per square foot of zinc coating complying with ASTM A 153, Class B-2 unless otherwise specified.

1. For single-wythe masonry, use units fabricated as follows:
 - a. Truss type fabricated with single pair of side rods and continuous diagonal cross-rods spaced not more than 16 inches on centers.
 - b. Product and Manufacturer: Provide one of the following:
 - 1) 120 Truss-Mesh by Hohmann and Barnard Company.
 - 2) Or approved equal.
 2. For multi-wythe masonry, use units fabricated as follows:
 - a. Tab type fabricated with single pair of side rods in interior wythe and adjustable two piece rectangular box type crossties spaced not more than 16 inches on centers. Space side rods for embedment in each face of back-up wythe and extend ties for proper embedment in facing wythe.
 - b. Product and Manufacturer: Provide one of the following:
 - 1) 165-2X Adjustable Truss by Hohmann and Barnard Company.
 - 2) Or approved equal.
- B. Individual Wire Ties for Masonry: Fabricate from 3/16-inch cold drawn steel wire complying with ASTM A 1064, with 1.5 ounces per square foot of hot-dip coating complying with ASTM A 153, Class B-2 of the length required for proper embedment in wythes of masonry shown.
1. For use with hollow masonry units laid with cells vertical, provide rectangular shaped ties.
 2. For use with solid masonry units or hollow units laid with cells horizontal, provide ties with ends bent to 90 degree angles to form hooks not less than 2 inches long.
 3. Product and Manufacturer: Provide one of the following:
 - a. Byna-Lok Seismic Wire Tie by Hohmann and Barnard Company.

- b. Or approved equal.
- 4. Where facing and backup joints do not align, use adjustable two piece ties with compression/tension bar.
 - a. Product and Manufacturer: Provide one of the following:
 - 1) Adjustable Wall Ties (Pinlets and Eyes with 2X-Hook) by Hohmann and Barnard Company.
 - 2) Or approved equal.
- C. Anchoring Devices for Masonry: Use straps, bars, bolts, and rods of the type and size shown and as follows:
 - 1. Flexible Anchors: Where masonry is shown or specified to be anchored to structural framework with flexible anchors, use anchors which will permit horizontal and vertical movement of masonry but will provide lateral restraint, and as follows:
 - a. For anchorage to concrete framework, use two piece anchors with 22 gage sheet metal dovetail with 1.5 ounces per square foot of hot dip zinc coating complying with ASTM A 153, Class B-2, or stainless steel, ASTM A 240, and 16 gage rectangular corrugated tie 1-inch wide sized to extend to within one inch of face of masonry or to a depth of 12 inches.
 - 1) Product and Manufacturer: Provide one of the following:
 - a) BL-303 Corrugated Dovetail Brick Tie by Blok-Lok, a Division of Hohmann and Barnard Company.
 - b) Or approved equal.
 - b. Provide concrete inserts and other items shown, specified or required by others. Refer to Section 04201, Unit Masonry Construction, paragraph 1.1.B for requirements of coordination by others.
 - c. For anchorage to existing concrete and masonry use 16 gauge rectangular corrugated tie 1-1/4 inches wide sized to extend to within one inch of face or masonry.
 - 1) Product and Manufacturer: Provide one of the following:
 - a) 345-SV by Hohmann and Barnard Company.

b) Or approved equal.

- 2) Lateral Supporting Masonry Wall Anchors: Provide 3/8-inch thick by 2-inches wide of length to extend to center of each wythe. Fabricate from steel with 1.5 ounces per square foot of zinc coating complying with ASTM A 153, Class B-2.

D. Miscellaneous Masonry Accessories:

1. Reinforcing Bars: Deformed steel, ASTM A 615, Grade 60 of the sizes shown.
2. Compressible Filler:
 - a. Use foamed polyurethane strip saturated with polybutylene waterproofing material. When compressed to 50 percent of its original volume, filler shall provide a watertight joint. The manufacturer shall furnish a certificate of compliance with these requirements. Filler shall maintain its resiliency to allow for installation in temperatures as low as -14°F, but not above 95°F. Filler shall be waterproof when compressed to 50 percent of its original volume in temperatures from -40 F to +200 F. Elongation shall be at least 250 percent with a tensile strength of not less than 100 psi. No migration of polybutylene compound in the polyurethane strip will be allowed.
 - b. Product and Manufacturer: Provide one of the following:
 - 1) NS-Closed Cell Neoprene Sponge by Hohmann and Bernard Company.
 - 2) Or approved equal.
3. Premolded Control Joint Strips for Concrete Masonry Units: Solid rubber strips with a Shore A durometer hardness of 60 to 80, designed to fit standard sash block and maintain lateral stability in masonry wall, size and configuration shall be as shown.
 - a. Cavity Fill Mesh: Provide 1/2-inch mesh hardware cloth, backed with asphalt impregnated cloth below. Install below all block courses that are to be filled with mortar.
 - b. Neoprene Control Joint Strips for Brick Masonry: Provide bellows type strip made from 1/16-inch cured, calendered neoprene with perforated flanges.

- 1) Product and Manufacturer: Provide one of the following:
 - a) Vertical wall expansion joints by Johns Manville.
 - b) RS Series-Rubber Control Joint by Hohmann and Barnard Company.
 - c) Or approved equal.
- c. Weep Holes: Provide 1/4-inch outside diameter by 4-inches long clear plastic tubes as applicable or otherwise indicated on drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refer to Section 042000, Concrete Masonry Units.

++ END OF SECTION ++

SECTION 04 20 10

UNIT MASONRY CONSTRUCTION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall furnish all labor, materials, equipment and incidentals required to provide unit masonry construction as shown and specified. The Work also includes:
 - a. Providing openings in masonry to accommodate the Work under this and other Sections and building into the masonry all items such as sleeves, anchor bolts, inserts and all other items to be embedded in masonry for which placement is not specifically provided under other Sections. Provide lintels in all openings or where directed by the Engineer.
 - b. Providing openings in masonry to accommodate the work under other contracts and assisting other contractors in building into the masonry all items such as sleeves, anchor bolts, inserts and all other items required to be embedded in masonry under other contracts.
 - c. Cutting and removing existing masonry for new openings and new abutting walls.

B. Coordination:

1. Review installation procedures under other Sections and coordinate the installation of items that must be installed with the masonry.
2. Notify other contractors in advance of the construction of the masonry to provide the other contractors with sufficient time for the installation of items included in their contracts that must be installed with the masonry.
3. This Section specifies the installation of unit masonry specified in the following:
 - a. Section 04 21 00, Brick Masonry.
 - b. Section 04 22 00, Concrete Masonry Units.

- C. Related Work Specified Elsewhere:
 - 1. Section 033000, Cast-in-Place Concrete.
 - 2. Section 041513, Mortar.
 - 3. Section 041500, Masonry Accessories.
 - 4. Section 042100, Brick Masonry.
 - 5. Section 055000, Metal Fabrications.
 - 6. Section 076000, Flashing and Sheet Metal.

1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: Wherever a fire resistance classification is shown or scheduled for unit masonry construction (4-hour, 3-hour, and similar designations), comply with applicable requirements for materials and installation established by UL and other governing authorities.
- B. Codes and Reference Standards: Comply with the applicable requirements of the New York State Uniform Fire Prevention and Building Code for the types of masonry construction shown and the following standards: ANSI A41.1 R70 Code Requirements for Masonry. ACI 531.1 Specifications for Concrete Masonry Construction Brick Industry Association, “Technical Notes on Brick and Tile Construction”. Brick Industry Association Technical Bulletin 1, “Cold Weather and Hot Weather Construction.” Brick Industry Association, Technical Notes on “Cleaning Brickwork”. National Concrete Masonry Association, “Guide Specifications” and “Technical Bulletins”. UL, Design Numbers U901 through U907.
- C. Construction Tolerances: In accordance with ACI 531.1 and the following:
 - 1. Variation from Plumb: For lines and surfaces of columns, walls and arises, do not exceed 1/4 inch in 10 feet, or 3/8 inch in a story height or 20 feet maximum, nor 1/2 inch in 40 feet or more. Except for external corners, expansion joints and other conspicuous lines, do not exceed 1/4 inch in any story or 20 feet maximum, nor 1/2 inch in 40 feet or more.
 - 2. Variation from Level: For lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4 inch in any bay or 20 feet maximum, nor 3/4 inch in 40 feet or more.

3. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4 inch nor plus 1/4 inch.
- D. Presubmittal Meeting: Before erecting the job mock-up, the Contractor and his installer shall meet on-site with the Engineer to discuss approved products and workmanship to ensure a match to existing adjacent masonry.
- E. Job Mock-up:
1. Prior to installation of unit masonry work, but after Engineer's approval of samples, erect job mock-up using materials, pattern bond and joint tooling shown or specified for final Work, to match existing adjacent masonry construction. Provide special features as directed including finished opening 1 foot-4 inches by 1 foot-4 inches, finished end, and expansion joint. Build mock-up at the site in location approved by the Engineer. The mockup shall be of full thickness and approximately 6 feet long by 4 feet high unless otherwise shown. Indicate the proposed range of color, texture and Workmanship to be expected in the completed work. Obtain Engineer's acceptance of visual qualities of the mock-up before start of masonry Work. Retain and protect mock-up during construction as a standard for judging completed masonry work. Do not alter, move or destroy mock-up until given written permission by Engineer. Masonry construction that does not meet the standards approved on the sample panel shall be removed and rebuilt as required by Engineer. Provide mock-up panel for typical exterior and interior sections to match existing adjacent areas.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials:
1. Deliver all materials to the site in the manufacturer's original unbroken, undamaged and unopened packaging with labels bearing the name of the manufacturer and the product. Masonry units and brick shall be factory packaged and strapped, delivered to the site and stored on skids.
- B. Storage of Materials:
1. Protect masonry materials during storage and construction with a properly erected shelter from wetting by rain, snow or ground water and from soilage or intermixture with earth or other materials.
 2. Store and handle all materials to prevent inclusion of water or foreign matter and to prevent damage of any nature. Packaged units kept in original unopened packages until time for use.

3. Distribute materials on floor slabs to prevent overloading. Designated live loads shown for floor shall not be exceeded.

C. Handling Materials:

1. Handle materials in a manner that minimizes chips, cracks, voids, discolorations or other defects which might be visible or cause staining in finished work.

1.4 JOB CONDITIONS

- A. Environmental Requirements: Do not place any masonry when air temperature is 40°F and falling. Masonry may be placed when air temperature is 32°F and rising. In either case, it may not be placed if temperature is expected to drop below 32°F during next 72 hours unless adequate protection is provided as specified in 1.4.B.4.b. below.

B. Protection:

1. Protect partially completed masonry against weather, when Work is not in progress, by covering top of walls with strong, waterproof, nonstaining membrane. Extend membrane at least 2 feet down both sides of walls and hold securely in place.
2. Do not apply uniform floor or roof loading for at least three days after completing masonry columns or walls.
3. Do not apply concentrated loads for at least seven days after completing masonry columns or walls.
4. Cold Weather Protection.
 - a. When surrounding air temperature is 48°F to 40°F protect masonry construction from rain or snow for a minimum of 48 hours by covering with nonstaining weathertight membrane.
 - b. When surrounding air temperature is 40°F and below maintain masonry construction temperature above 40°F for a minimum of 48 hours by enclosure and supplementary heat, electric heating blankets, infrared lamps, or other methods acceptable as directed by the Engineer.
5. Hot Weather Protection: Protect masonry construction, by methods acceptable to Engineer, from direct exposure to wind and sun when the surrounding air temperature is 99°F in the shade with relative humidity less than 50 percent.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Refer to the following Sections for required masonry materials:
 - 1. Section 03 30 00, Cast-In-Place Concrete.
 - 2. Section 04 05 13, Mortar.
 - 3. Section 04 15 00, Masonry Accessories.
 - 5. Section 04 20 00, Concrete Masonry Units.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine areas and conditions under which unit masonry Work is to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.

3.2 PREPARATION

- A. Clean dirt, debris, oil, grease and other materials which would effect the bond of mortar from all surfaces to receive work under this Section.
- B. Wetting of Masonry Units:
 - 1. Brick: Wet brick having ASTM C 67 absorption rates greater than 0.25 ounce per square inch per minute.
 - a. Determine absorption by placing 20 drops of water inside a circle the size of a quarter on typical units. If water is absorbed within 1-1/2 minutes, wet brick before laying.
 - 2. Use wetting methods which ensure that each masonry unit is nearly saturated but surface dry when laid.
 - 3. Except for absorbent units specified to be wetted, lay masonry units dry. Do not wet concrete masonry units.

3.3 INSTALLATION, GENERAL

- A. Thickness: Build walls, floors and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness shown or specified.
- B. Build chases and recesses as applicable and shown or required by others. Refer to paragraph 1.1.B. herein for the requirements of coordination with others. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.
- C. Leave openings for equipment, piping, ducts, and other items to be installed subsequent to starting of masonry Work. After installation of said items, complete masonry Work to match Work immediately adjacent to openings.
- D. Cut masonry units using motor driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide pattern shown and to fit adjoining Work neatly. Use full size units without cutting wherever possible.
- E. Matching Adjacent Existing Masonry Work: Match coursing, pattern bond color and texture of new masonry work with adjacent existing work.

3.4 LAYING MASONRY WALLS

- A. General:
 - 1. Mortar Types: Unless otherwise indicated, use mortar as specified in Section 04100, Mortar, and as follows:
 - a. For all Work, use Type S mortar.
 - b. Do not use mortar which has begun to set or if more than 1/2 hour has elapsed since initial mixing. Retemper mortar during the 1/2-hour period only as required to restore workability.
 - 2. Layout walls in advance for accurate spacing of surface pattern bond with uniform joint widths and to properly locate openings, expansion joints, returns and offsets. Avoid the use of less than half size units at corners, jambs and wherever possible at other locations.
 - 3. Lay up walls plumb and true to comply with specified tolerances, with courses level, accurately spaced and coordinated with other Work.
 - 4. Pattern Bond: Lay exposed masonry in running bond and as shown to match adjacent existing masonry. Lay concealed masonry with all units in a wythe bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than 4-inch horizontal face dimensions at corners or jambs.

B. Mortar Bedding and Jointing:

1. Lay solid masonry units with completely filled bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush in cross joints and do not furrow bed joints. Use trowel edge for flat bed joints. Fill all parapet blocks solid with grout.
2. Bed and lay brick and concrete masonry units at the proper angle with fully slushed joints.
3. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course of piers columns and pilasters and where adjacent to cells or cavities to be reinforced or filled with concrete or grout.
 - a. Maintain 3/8-inch joints, except for minor variations required to maintain half bond.
4. Cut joints flush for masonry walls that are to be concealed or to be covered by other materials, unless otherwise shown.
5. Tool exposed joints slightly concave, to match existing. Rake out mortar in preparation for application of caulking or sealants where required.
6. Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not hammer or otherwise force brick at corners, whether at jambs or changing the direction of a wall in order to force plumb the corner or jamb. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

C. Collar Joints:

1. Fill the vertical space between wythes solidly with mortar by parging the in-place wythe and shoving units into the parging, for the following masonry work:
 - a. All walls, except cavity walls, and interior walls and partitions.

D. Stopping and Resuming Work: Rack back 1/2-brick length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly, if required, and remove loose masonry units and mortar prior to laying new masonry.

E. Built-in Work:

1. As the Work progresses, build in items shown, specified or required by others. Refer to paragraph 1.1.B. herein for the requirements of coordination with others. Fill cores in one block width solidly with masonry around built-in items.
 - a. Fill space between hollow metal frames and masonry solidly with mortar.
 - b. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of cavity fill mesh in the joint below and rod mortar or grout into core.

F. Interior Walls:

1. Nonload-Bearing Interior Partitions and Interior Wythe of Cavity Walls: Build full height of story to underside of structure above, unless otherwise shown.
2. Tie walls at top and sides with masonry anchors as specified in Section 04150. Insert compressible filler, specified in Section 04150, in all horizontal and vertical joints where masonry terminates. Insert filler 3/4 inches from both faces of masonry. Use filler four times as thick as the widest part of the joint. Thickness of filler shall be a minimum of 4 times the compressed thickness. Compress filler to less than thickness of joint and insert. At splices, overlap strips by 3 inches and compress ends to form tight joint. Finish with backer rod and sealant.
3. At masonry walls requiring a fire rating use fire safing insulation specified in Section 07210. Insert insulation in a continuous, vaportight, solid blanket to 3/4-inches from both faces. Finish with backer rod and sealant.

G. Horizontal Joint Reinforcing:

1. Provide continuous horizontal joint reinforcing as shown and specified. Refer to Section 04150, Masonry Accessories, for type of reinforcing units required. Fully embed longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls and 1/2 inch at other locations. Lap reinforcement a minimum of 6 inches at ends of units. Do not bridge control and expansion joints with reinforcing.
2. Reinforce all walls with continuous horizontal joint reinforcing unless specifically noted or specified to be omitted.

CONTRACT NO. 22-522
DIVISION 4 – MASONRY

3. Provide continuity at corners and wall intersections by use of prefabricated “L” and “T” sections. Cut and bend units in accordance with manufacturer’s written instructions for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.
4. Space continuous horizontal reinforcing as follows:
 - a. For multi-wythe walls, solid or cavity, where continuous horizontal reinforcing also acts as structural bond or tie between wythes, space reinforcing as required by code but not more than 16 inches on centers vertically.
 - b. For single wythe walls, space reinforcing at 16 inches on centers vertically, unless otherwise shown.
 - c. For parapets, space reinforcing at 8 inches on centers vertically, unless otherwise shown.
5. Reinforce masonry openings greater than 12 inches wide, with horizontal joint reinforcing placed in two horizontal joints approximately 8 inches apart, immediately above the lintel and immediately below the sill. Extend reinforcing a minimum of 24 inches beyond jambs of the opening.
 - a. In addition to wall reinforcing, provide additional reinforcing at openings as required to comply with the above.

H. Anchoring Masonry Work:

1. Provide anchoring devices of the type shown and as specified under Section 04150, Masonry Accessories. If not shown or specified, provide standard type for facing and backup involved.
2. Anchor masonry to structural members where masonry abuts or faces such members to comply with the following:
 - a. Provide an open space not less than 1/2 inch in width between masonry and structural member, unless otherwise shown. Keep open space free of mortar or other rigid materials.
 - b. Anchor masonry to structural members with metal ties embedded in masonry joints and attached to structure. Provide anchors with flexible tie sections, unless otherwise shown.
 - c. Space anchors as shown, but not more than 16 inches on center vertically and 36 inches on center horizontally.

3. Anchor single wythe masonry veneer to backing with metal ties as follows:
 - a. Anchor veneer to structural members with metal anchors embedded in masonry joints and attached to structure. Provide anchors with flexible tie section, unless otherwise shown.
 - b. Anchor veneer to concrete back up with dovetail anchors.
 - c. Anchor veneer to existing concrete and masonry backup with corrugated anchors attached with stainless steel expansion bolts.

I. Control Joints:

1. Provide vertical expansion, control and isolation joints in masonry where shown. Build in related items as the masonry Work progresses. Rake out mortar in preparation for application of caulking and sealants. Refer to Section 07920, Caulking and Sealants.
 - a. Provide items specified under Section 04150, Masonry Accessories, where shown.
 - 1) Build flanges of factory fabricated neoprene control joint into brick masonry and premolded control joint strips into concrete unit masonry. Refer to Section 04150.
 - 2) Build in compressible fillers specified under Section 04150, Masonry Accessories, where shown. Install in accordance with manufacturer's written instructions.
2. Control Joint Spacing: Where location of control joints are not shown, place vertical joints spaced not to exceed 50 feet-0 inches on centers for clay masonry or 35 feet-0 inches on centers for concrete masonry wythes if reinforced. Locate control joints in the masonry Work as shown and including the following:
 - a. At structural column or joint between bays.
 - b. Above expansion or control joints in the supporting structure.
 - c. Above major openings at end of lintels upward and below at ends of sills downward. Place at one side of jamb for openings less than 6 feet-0 inches wide and at both sides for openings over 6 feet-0 inches wide.
 - d. At vertical chases, recesses and other points of reduction in wall thickness.

- e. At locations where masonry wall height changes by more than 20 percent.
- f. Where masonry abuts supporting structure.
- g. At a distance equal to 1/2 the wall height from corners or intersections with other masonry.
- h. Submit joint locations to Engineer for approval.

J. Lintels:

- 1. Provide steel lintels and masonry U-block lintels, where shown on the Contract Drawings, and specified in Section 055000, Metal Fabrications.
- 2. Provide masonry lintels where shown and wherever openings of 16 inches or more are shown without structural lintels. Provide precast or formed in place masonry lintels. Thoroughly cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.
 - a. Unless otherwise shown, provide one horizontal reinforcing bar for each 4 inches of wall thickness, of size-number not less than the number of feet of opening width.
 - b. For hollow masonry unit walls, use specially formed “U” shaped lintel units with reinforcing bars placed as shown, filled with Type M mortar.
- 3. Provide minimum bearing at each jamb, of 4 inches for openings less than 6 feet-0 inches wide, and 8 inches for wider openings.

K. Flashing of Masonry Work:

- 1. Provide concealed flashings in masonry Work as shown. Refer to Section 076000, Flashing and Sheet Metal, for type of flashing required. Prepare masonry surfaces smooth and free from projections which might puncture flashing. Place through wall flashing on bed of mortar and cover with mortar. Seal flashing penetrations with mastic before covering with mortar. Terminate flashing 1/2 inch from face of wall, unless otherwise shown.
 - a. Extend flashings beyond edge of lintels and sills at least 4 inches and turn up edge on sides to form pan to direct moisture to exterior.
 - b. Install elastic flashings in accordance with manufacturer’s instructions.

2. Provide 3/8” wide x 1 1/2” long plastic insert type weep joints in the head joints of the first course of masonry immediately above concealed flashings. Space 24 inches on center, unless otherwise shown.
3. Install reglets and nailers for flashing and other related work where shown to be built into masonry Work.
4. Install emergency scuppers as shown.

3.5 CUTTING AND REMOVING EXISTING MASONRY

- A. Wherever existing masonry is shown to be cut and removed use methods that will produce sharp, true edges to accept new abutting work.

3.6 REPAIR, POINTING AND CLEANING

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point up all joints at corners, openings and adjacent work to provide a neat, uniform appearance, properly prepared for application of caulking or sealant compounds.
- C. Cleaning Exposed, Unglazed Masonry Surfaces:
 1. Wipe off excess mortar as the Work progresses. Dry brush at the end of each day’s work.
 2. Final Cleaning: After mortar is thoroughly set and cured, clean sample wall area of approximately 20 square feet as described below. Obtain Engineer’s acceptance of sample cleaning before proceeding to clean remainder of masonry work.
 - a. Dry clean to remove large particles of mortar using wood paddles and scrappers. Use chisel or wire brush if required.
 - b. Presoak wall by saturating with water and flush off loose mortar and dirt.
 - c. Scrub down wall with stiff fiber brush and a solution of 1/2 cup of trisodium phosphate and 1/2 cup of household detergent dissolved in one gallon of water.

CONTRACT NO. 22-522
DIVISION 4 – MASONRY

- d. Rinse walls, using clean, pressurized water, to neutralize cleaning solution and remove loose material.
 - e. Acid cleaning of masonry will not be permitted.
3. Clear Coatings: See Section 09900, Painting.
- D. Protection:
- 1. Protect the masonry Work from deterioration, discoloration or damage during subsequent construction operations.
 - 2. When work on any brick or block masonry is finished for the day or discontinued on account of rain or snow, or where top of new work is likely to be damaged by storms, sloping planks covered with tarred felt shall be placed over the top of walls.

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 04 22 00

CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. The General Contractor shall furnish all labor, materials, equipment and incidentals required to provide concrete unit masonry as shown and specified.
2. The extent of each type of block is shown on the Drawings.

B. Related Work Specified Elsewhere:

1. Section 04 05 13, Mortar.
2. Section 04 15 00, Masonry Accessories.
3. Section 04 20 10, Unit Masonry Construction.

1.2 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies: Wherever a fire-resistance classification is shown or scheduled for concrete unit masonry construction (4-hour, 3-hour and similar designations), provide units complying with the requirements established by the UL, governing authorities and the New York State Uniform Fire Prevention and Building Code for types of concrete unit masonry shown.

B. Source Quality Control: Obtain units from one manufacturer, cured by one process and of uniform texture and color, for each type required.

C. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

1. ASTM C 33, Standard Specification for Concrete Aggregates.
2. ASTM C 90, Hollow Load-Bearing Concrete Masonry Units.
3. ASTM C 129, Hollow, Non-Load Bearing Concrete Masonry Units.
4. ASTM C 145, Solid Lightweight Load-Bearing Concrete Masonry Units.

5. ASTM C 331, Standard Specification for Light-weight Aggregates for Concrete Masonry Units.
6. ASTM E 84, Standard Method of Test for Surface Burning Characteristics of Building Materials.
7. ASTM C 140, Sampling and Testing Concrete Masonry Units.

1.3 SUBMITTALS

- A. Samples: Submit for approval samples of each type of concrete masonry unit specified. Select units to show range of color and texture which can be expected in the finished Work. Engineer's review will be for color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.
- B. Manufacturer's Data: Submit for approval copies of manufacturer's specifications and test data for each type of concrete masonry unit required, including certification that each type complies with the specified requirements. Include instructions for handling, storage, installation and protection of each type of concrete masonry unit.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials: Deliver concrete masonry units in unopened, undamaged original packages and pallets, plainly marked with identification of materials and manufacturer.
- B. Storage of Materials: Store and cover concrete masonry units to prevent damage such as chipping and staining. Store and handle all materials to prevent inclusion of water or foreign matter and to prevent damage of any nature. Packaged units shall be kept in original unopened packages until time for use.
- C. Distribute materials on floor slabs to prevent overloading. Designated live loads shown for floor shall not be exceeded.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Size: Manufacturer's standard units with nominal face dimensions of 16 inches long by 8 inches high (15 5/8 inches by 7 5/8 inches actual), unless otherwise specified.
- B. Special Shapes: Provide lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions where shown. Provide bullnose block for outside corners where shown or where used in adjacent masonry.

2.2 CONCRETE MASONRY UNITS

- A. General: All materials utilized on this job shall be new and the compressive strength of the assembled masonry (f/m) shall be at least 1,500 psi in accordance with ACI 530.
- B. Concrete Block (C.M.U.):
1. General: Where concrete masonry units are shown, comply with the following classifications, weights, grades, curing, and other requirements as specified.
 2. Hollow Load-Bearing Concrete Masonry Units nominally 6 inches or more in thickness: ASTM C 90, Type I.
 3. Hollow Non-Load Bearing Concrete Masonry Units nominally less than 6 inches: ASTM C 129, Type I.
 4. Solid Load-Bearing Concrete Masonry Units: ASTM C 90, Type L
 5. Concrete Building Brick: ASTM C 55, Type I, Grade N.
 6. Fire Rated Units: Aggregate type and equivalent solid thickness as required to obtain the fire resistance rating indicated. Fire resistance ratings shall be based on fire tests in accordance with ASTM E 119.
 7. Weight: Provide normal weight units using aggregate complying with ASTM C 90 producing dry net weight of not less than 125 pounds per cubic foot, unless otherwise specified.
 - a. Aggregate:
 - 1) Lightweight Units: ASTM C 331; dry net weight not more than 105 lb per cu ft.
 - 2) Normal Weight Units: ASTM C 33; dry net weight not less than 125 lb per cu ft.
 8. Special Shapes: Units of shape and size required for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions indicated.
 - a. Outside Corners: Square edge units.
 - b. Units for Walls and Partitions to be Filled with Loose Type Insulation: Two cell (core) units.

9. Curing: Cure units in a moisture controlled atmosphere or in an autoclave at normal pressure and temperature to comply with ASTM C 90, Type I.
 - a. Limit moisture absorption during delivery and until time of installation to the maximum percentage specified for Type I units for the average annual relative humidity as reported by the United States Weather Bureau Station nearest the project site.
 10. Exposed Faces: Provide manufacturer's standard and custom color and texture, unless otherwise indicated.
 11. Units shall be manufactured not less than 30 days prior to being used and stored under cover until shipment.
- C. Architectural Concrete Block (C.M.U.):
1. Hollow Load Bearing Units: Provide unit type and size(s) indicated on the drawings
 - a. Masonry units meeting all ASTM C 90 testing requirements and containing integral mixed color with product types listed below. Type selection is as specified on the drawings:
 - 1) Brik structural masonry units [optional: with Water Control Technology (WCT)]
 - 2) Brik masonry veneer units
 - 3) Brik Jumbo structural masonry units.
 - 4) Thermal Hi-R Half High Insulated masonry units (Spec-Brik HI-R when using Spec-Brik blended colors)
 - 5) Thermal Hi-R-H Half High insulated masonry units (Spec-Brik HI-R-H when using Spec-Brik blended colors)
 - 6) Thermal Hi-R insulated Masonry Units.
 - 7) Thermal Hi-R-H insulated Masonry Units.
 - 8) Surface smooth and dense masonry units for painting.
 - 9) Split - Splitface masonry units
 - 10) Polished and Textured specialty masonry units.
 - b. Unit Weight:
 - 1) Normal weight units.

- c. Linear shrinkage: Not to exceed 0.065 percent, ASTM C 90.
 - d. Unit Compressive Strength: Minimum net area compressive strength of 2,000 psi.
 - e. Integral Water Repellent Concrete Masonry Units: Provide all exterior wall architectural concrete masonry units, including single wythe walls and facing units, containing the manufacturer's recommended type and amount of an integral polymeric water repellent admixture.
 - f. Color as selected by Owner from manufacturer's standard color selection chart.
2. Special shapes:
- a. Provide closures, jamb units, headers, lintels, bond beams and other special shapes as indicated on the drawings.
 - b. Provide standard manufactured sizes or cut full size units for fractional course height and lengths.
- D. Pre-installed, U-shaped Concrete Masonry Insulation: (Where applicable or otherwise indicated on Drawings)
- 1. Product: Korfil inserts manufactured by Concrete Block Insulating Systems & available exclusively from Concrete Masonry Block Producers.
 - 2. Pre-installed U-shaped, Concrete Masonry Unit Insulation.
 - a. Description: Inserts pre-installed in CMU's prior to delivery to jobsite shall comply with ASTM C 578; Standard Type X.
 - b. Physical Properties:
 - 1) Moisture Absorption: ASTM C 272= < 1.0% by volume
 - 2) Fire Characteristics:
 - a) ASTM E 84 – Flame Spread < 5.
 - b) ASTM E 119 – Insert shall cause no reduction in hourly rating.
 - c. Thermal Resistance (R) per inch of thickness = 5.00.
 - d. Drainage: Allows full drainage of water in cores of masonry units.

CONTRACT NO. 22-522
DIVISION 4 – MASONRY

- e. Rot & Vermin Resistance: Produced from expanded polystyrene –fully resistant to rot; does not attract vermin, termites or rodents.
 - f. Density: ASTM C 303 – 18.3 kg/m³ (1.3 lb./cu. ft.)
 - g. Components: Insulation shall contain no fluorocarbons and no formaldehyde.
 - h. Shape: U-shaped insert accomplishing compression fit with inside spaces of both the front and rear face shells and the central web of the CMU allowing rebar placement at center of wall, and handhold access at center web of the CMU.
- E. Pre-installed insulated HI-R Masonry Units for Non-Load Bearing Walls
- 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1500 psi.
 - 2. Weight Classification: Normal weight.
 - 3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
 - 4. Exposed Faces: Provide color and texture matching the range represented by Engineer's sample.
 - 5. Split faced CMU: Color shall be selected by the Owner from manufacturer's standard colors.
- F. Pre-installed insulated two piece, interlocking, HI-R-H Masonry Units for Load Bearing Walls
- 1. Concrete Block Insulation Systems, Inc. expanded polystyrene Insulation Inserts made from flame-retardant treated expandable polystyrene by Korfil Hi-R-H insulation, Icon Universal Inserts, or approved equal, which are to be pre-installed in the CMU's prior to delivery to jobsite.
 - 2. Physical Properties of EPS:
 - a. Typical Density (lbs./cu.ft.) Min.: 1.05-1.50
 - b. Thermal Resistance (R) per inch: 5.00
 - c. Water Vapor Permeance: 1.10
 - d. Water Absorption% volume: <1.00
 - e. Flame Spread Rating: <5.00

3. Additional Properties of EPS Inserts:
 - a. Rot and Vermin resistance: Produced from expanded polystyrene – full resistant to rot; does not attract vermin, termites or rodents.
 - b. Components: Insulation shall contain no fluorocarbons and no formaldehyde.
 - c. Shape: Two-piece, interlocking insert shall overlap at both head & bed joints with edges of adjacent inserts of the same type. Keyway shall be provided for butt welded cross-rods of 16" o.c. ladder type horizontal wall reinforcement.

2.3 MASONRY CELL INSULATION

- A. Molded-Polystyrene Insulation Units: CBIS KORFIL Rigid, cellular thermal insulation formed by the expansion of polystyrene-resin beads or granules in a closed mold to comply with ASTM C 578, Type I. Provide specially shaped units designed for installing in cores of masonry units.
- B. Loose-Granular Fill Insulation: Perlite complying with ASTM C 549, Type II (surface treated for water repellency and limited moisture absorption) or Type IV (surface treated for water repellency and to limit dust generation).

2.4 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Manufacturers:
 - a . Diedrich Technologies, Inc.
 - b . EaCo Chem, Inc.
 - c . ProSoCo, Inc.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. See Section 04201, Unit Masonry Construction.
- B. For Korfill Concrete Masonry Unit:
 - 1. General: Inserts shall be pre-installed by CMU manufacturer prior to Delivery to jobsite.
 - 2. Unless otherwise indicated on Construction Documents, inserts shall be left in place when grouting.

++ END OF SECTION ++

SECTION 05 50 30

ANCHOR BOLTS, EXPANSION ANCHORS AND CONCRETE INSERTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall furnish all labor, materials, equipment and incidentals required to provide anchor bolts, expansion and adhesive anchors and concrete inserts, etc. as shown and specified.

- B.** This Section includes all bolts, anchors and inserts required for the Work but not specified under other Sections.

1.2 QUALITY ASSURANCE

- A. Reference Standards:** Comply with the applicable provisions and recommendations of the following, except as otherwise shown and specified.

1. ASTM A 307, Carbon Steel Externally and Internally Threaded Standard Fasteners.
2. ASTM A 320, Alloy-Steel Bolting Materials for Low-Temperature Service.

- B.** Expansion anchors and inserts shall be UL or FM approved.

1.3 SUBMITTALS

- A. Samples:** Submit for approval representative samples of bolts, anchors and inserts as may be requested by the Engineer. His review will be for type and finish only. Compliance with all other requirements is exclusive responsibility of Contractor.

- B. Shop Drawings:** Submit for approval the following:

1. Setting drawings and templates for location and installation of anchorage devices.
2. Copies of manufacturer's specifications, load tables, dimension diagrams and installation instructions for the devices.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

- A. When the size, length or load carrying capacity of an anchor bolt, expansion anchor, or concrete insert is not shown on the Drawings, provide the size, length and capacity required to carry the design load times a minimum safety factor of four.
- B. Determine design loads as follows:
 - 1. Use the design load recommended by the manufacturer and approved by the Engineer.

2.2 MATERIALS

- A. Masonry Anchors:
 - 1. Provide carbon steel anchors, as shown on Contract Drawings.
 - 2. Product and Manufacturer: Provide anchors by one of the following:
 - a. Hilti, Incorporated.
 - b. Or approved equal.
- B. Adhesive Anchors:
 - 1. Provide 316 stainless steel or carbon steel HVA adhesive anchors as shown on Contract Drawings.
 - 2. Product and Manufacturer:
 - a. Hilti, Incorporated
 - b. Or approved equal.
- C. Expansion Anchors:
 - 1. Provide 316 stainless steel or carbon steel expansion anchors as shown on Contract Drawings.
 - 2. Product and Manufacturer:
 - a. Hilti, Incorporated
 - b. Or approved equal.

- D. Powder actuated fasteners and other types of bolts and fasteners not specified herein shall not be used unless approved by Engineer.
- E. Connection Bolts, Nuts and Washers: Materials shall be as specified in other Sections of the Specifications, or shown on the Drawings. Where materials are not specified or shown on the Drawings, they shall be of Type 304 stainless steel.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Drilling equipment used and installation of expansion anchors shall be in accordance with manufacturer's instructions.
- B. Assure that embedded items are protected from damage and are not filled in with concrete.
- C. Adhesive anchors shall be used as shown or approved by the Engineer.
- D. Unless otherwise shown or approved by Engineer conform to following for expansion anchors:
 - 1. Minimum embedment depth in concrete: Mfr. Recommendations.
 - 2. Minimum anchor spacing on centers: Mfr. Recommendations.
 - 3. Minimum distance to edge of concrete: Mfr. Recommendations.
 - 4. Increase dimensions above to develop the full anchor load capacity.

3.2 CLEANING

- A. After embedding concrete is placed, remove protection and clean bolts and inserts.

++ END OF SECTION ++

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SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01 33 00, Submittal Procedures
- B. Section 01 74 00, Cleaning and Waste Management
- C. Section 09 90 00, Painting

1.2 REFERENCES

- A. Standards: Comply with the following unless otherwise specified or indicated on the Drawings:
 - 1. Lumber: American Softwood Lumber Standard PS 20 by the U.S. Department of Commerce. Comply with applicable provisions for each indicated use.
 - 2. Plywood: Product Standard PS 1 for Softwood Plywood, Construction and Industrial by the U.S. Department of Commerce.
 - 3. Plywood Installation: APA Design/Construction Guide, Residential & Commercial by the American Plywood Association (APA).
 - 4. Grading Rules:
 - a. Douglas Fir, Hem-Fir, Idaho White Pine, and other Western Woods: Western Wood Products Association (WWPA) or West Coast Lumber Inspection Bureau (WCLIB).
 - b. Southern Pine: Southern Pine Inspection Bureau (SPIB).
 - c. Redwood: Redwood Inspection Service (RIS).
 - d. Spruce-Pine-Fir: National Lumber Grades Authority (NLGA).
 - 5. User Specification for Treated Wood, American Wood Protection Association Standard (AWPA) U1-02.
 - 6. Framing Installation: American Forest and Paper Association (AFPA).
 - 7. ICC Evaluation Service, Inc.; ESR-1721.

8. LEED Certification: Forest Stewardship Council (FSC) Principles and Criteria

1.3 SUBMITTALS

A. Quality Control Submittals:

1. Certificates: Certification for the following wood treatments:
 - a. Pressure Treatment: Certification by treating plant stating chemicals and process used, net amount of chemical preservative retained, and conformance with specified standards.
 - b. Waterborne Preservatives: Certified written statement that moisture content of treated materials was reduced to a maximum of 19 percent prior to shipment to Project site.
 - c. Fire-Retardant Treatment: Certification by treating plant stating treated material complies with specified standards and treatment will not bleed through specified finishes.

1.4 QUALITY ASSURANCE

- #### A. Mill and Producers Mark: Each piece of lumber and plywood shall be gradestamped indicating type, grade, mill, and grading agency certified by the Board of Review of the American Lumber Standards Committee. Mark shall appear on unfinished surface, or ends of pieces with finished surfaces.
1. Pressure Preservative Treated Material: Accredited agency quality mark on each piece of wood indicating treatment.
 2. Fire-Retardant Treated Material: Accredited testing agency mark on each piece of wood indicating compliance with the fire hazard classification.

1.5 DELIVERY, STORAGE, AND HANDLING

- #### A. Keep materials dry during delivery. Store materials 6 inches minimum height above ground surface. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation between stacks.
- #### B. Cover stored materials until ready for use for protection from moisture. Place and anchor cover in a manner that will provide good ventilation under the covering.

1.6 PROJECT CONDITIONS

- #### A. Correlate location of supporting members to allow proper attachment of other Work.

PART 2 - PRODUCTS

2.1 LUMBER

- A. General: Furnish FSC certified wood products only, with all pieces stamped with the FSC Label. Furnish seasoned dimension lumber dressed to nominal sizes indicated with 19 percent maximum moisture content at time of dressing, marked “S-DRY”. Comply with dry size requirements of PS 20.
 - 1. Dress: Surfaced 4 sides (S4S) unless otherwise indicated.
- B. Framing Lumber: Species: Douglas Fir or Hem-Fir (WWPA or WCLIB), Southern Pine (SPIB), Redwood (RIS), or Spruce-Pine-Fir (NLGA) unless otherwise indicated.
 - 1. Light Framing; 2 inches through 4 inches thick, less than 6 inches wide:
 - a. Stud grade lumber for stud framing and Standard grade lumber for other light framing.
 - 2. Structural Framing; 2 inches through 4 inches thick, 6 inches and wider:
 - a. Select Structural grade.
 - 3. Exposed Framing; 2 inches through 4 inches thick: Furnish the following species and grade where framing will not be concealed by other Work:
 - a. Douglas Fir, Select Structural grade (WWPA or WCLIB).
- C. Board Lumber; less than 2 inches thick:
 - 1. Exposed Board Lumber, for Paint Finish: Southern Pine No. 1 (SPIB), Douglas Fir 2 Common (WWPA) or Select Merchantable (WCLIB), Redwood Construction Common (RIS), or Spruce-Pine-Fir No. 1 / No. 2 (NLGA).
 - 2. Exposed Board Lumber, for Transparent Finish: Redwood Clear (RIS).
 - 3. Concealed Board Lumber: Southern Pine No. 3 (SPIB), any species No. 4 (WWPA) or any species Standard (WCLIB), Redwood Merchantable (RIS), or Spruce-Pine-Fir No. 1 / No. 2 (NLGA).
- D. Miscellaneous Lumber: Standard grade, No. 3 grade, or better grade of the following species unless otherwise indicated:

CONTRACT NO. 22-522
DIVISION 6 – WOOD AND PLASTIC

1. Nailers and Blocking: Douglas Fir, Hem-Fir, Idaho White Pine, Southern Pine, or Spruce-Pine-Fir.
2. Furring: Douglas Fir, Southern Pine, or Spruce-Pine-Fir.
3. Plaster Grounds:
 - a. Interior Use: Douglas Fir, Southern Pine, or Spruce-Pine-Fir.
 - b. Exterior Use: White Oak, Douglas Fir or approved equal.

2.2 PLYWOOD (where applicable and indicated on drawings)

- A. Sheathing and Subflooring: APA RATED SHEATHING, EXPOSURE 1. Furnish APA PS 1 veneered panels, with span ratings for the required thicknesses as listed below unless otherwise indicated.

THICKNESS	SPAN RATING
3/8 inch	24/0
1/2 inch	32/16
5/8 inch	40/20
3/4 inch	48/24

- B. Underlayment: APA UNDERLAYMENT, EXPOSURE 1.
1. For use under resilient tile flooring and resilient sheet flooring: Sanded face.
 2. For use under carpet and “liquid” flooring: Touch-sanded.

2.3 PARTICLEBOARD

- A. Underlayment: ANSI A 208.1, Type 1, Density Range M (40 lb/cu ft minimum average).

2.4 HARDBOARD

- A. Hardboard: PS 58, Class “Tempered”, S1S, plain board.

2.5 MISCELLANEOUS MATERIALS

- A. Underlayment Patching Compound: Hardsetting, quicksetting type with latex or polyvinyl acetate binder.
- B. Asphalt Felt: Asphalt-saturated felt, No. 15, without perforations, complying with ASTM D 226.

- C. Rosin Paper: Commercial, rosin-sized building paper, 0.010 inch thick.

2.6 PRESERVATIVE TREATMENT

- A. Treat lumber and plywood where indicated and as specified. Comply with applicable AWPA U1 Standards and quality control and inspection requirements.
 - 1. Fasteners and anchoring devices to be used with wood treated with waterbourne preservatives shall be hot-dipped galvanized or stainless steel if the wood will be exposed to moisture.
- B. Complete fabrication of items to be treated to the greatest extent possible prior to treatment. Where items must be cut after treatment, coat cut surfaces with heavy brush coat of the same chemical used for treatment or other solution recommended by AWPA Standards for the treatment.
- C. Inspect wood after treating and drying. Discard warped or twisted items.
- D. Wood Treatment: Compatible with galvanized metal connector plates, unless other compatible protective finish for connector plates is approved by the Director for use with approved treatment.
 - 1. Preservative Treatment: Category UC3A for Exterior Construction above Ground; coated and exposed to rapid water runoff.
 - 2. Nailers, blocking, furring, stripping, and similar concealed members in contact with exterior masonry and concrete (including interior wythe of exterior walls), and all sills for framing.
 - 3. Wood items indicated or scheduled on the Drawings to be preservative treated.
- E. Wood Treatment: Compatible with galvanized metal connector plates, unless other compatible protective finish for connector plates is approved by the Director for use with approved treatment.
 - 1. Preservative Treatment: Category UC4A for Ground Contact or Freshwater; Non-critical components.

2.7 FIRE-RETARDANT TREATMENT

- A. Furnish “FR-S” lumber where indicated, complying with AWPA U1 Standards for pressure impregnation with fire-retardant chemicals to achieve a flamespread rating of 25 or less, when tested in accordance with UL Test 723, ASTM E 84 or NFPA Test 255.

1. Where treated items are indicated to receive a transparent or paint finish, use a fire-retardant treatment which will not bleed through or adversely affect bond of finish.
2. Provide UL label or identifying mark on each piece of fire-retardant lumber.
3. Redry treated items to a maximum moisture content of 19 percent after treatment.

2.8 FRAMING HARDWARE (where applicable)

- A. Fasteners and Anchoring Devices: Select and furnish items of type, size, style, grade, and class as required for secure installation of the Work. Items shall be Hot Dip galvanized or stainless steel for exterior use. Items exposed to treated wood shall be Hot-Dip galvanized conforming to ASTM Standard A653; Class G-185 or AISI 304 or AISI 316 stainless steel. Unless shown or specified otherwise, comply with the following:
1. Nails, Screws, Lag Screws/Lag Bolts, Bolts/Nuts/Washers:
 - a. Hot-Dip galvanized, ASTM Standard A653; Class G-185.
 - b. Stainless steel AISI 304 or AISI 316.
 - c. Zinc or cadmium plated.
 - d. Silicon bronze.
 2. Expansion Anchors: Hot-Dip galvanized steel wedge anchors, ASTM Standard A653; Class G-185.
 3. Toggle Bolts: Cadmium or zinc plated tumble - wing type.
 4. Self Threading Masonry Screws: Zinc Plated; “Tapcon” by Elco Industries, Inc., 1111 Samuelson Rd., PO Box 7009, Rockford, IL 61125-7009, (815) 397-5151.
 5. Bar or Strap Anchors: ASTM A575 carbon steel bars.
 6. Wall Plugs: Corrugated type, galvanized steel, 24 USS gage min, not less than 2 inches wide x 2-1/2 inches deep.
 7. Cross Bridging: Nailable type, galvanized steel, 16 USS gage min, by 3/4 inch wide.
 8. Metal Hangers and Framing Anchors: Size and type for intended use, galvanized finish, manufacturer’s recommended fasteners. Items exposed

to treated wood shall be Hot-Dip galvanized conforming to ASTM Standard A653; Class G-185 and epoxy coated in the field.

9. Buck Anchors: Corrugated type, galvanized steel not lighter than 12 USS gage min, 4 inches wide (except where partitions are less than 4 inches thick) by 8 inches long, punched for two 5/16 inch carriage bolts at buck end.
10. Sleeper Anchors: Approved type, galvanized steel not lighter than 20 USS gage min, not less than 1-1/4 inches wide, designed to anchor into concrete not less than 1-1/2 inches and permit height adjustment of sleeper.
11. Stainless Steel Anchors: AISI 304 or AISI 316; Applications include permanent wood foundations and corrosive environments such as saltwater spray and preservative treated wood.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine substrate and supporting structure on which rough carpentry is to be installed for defects that will adversely affect the execution and quality of the Work. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION - GENERAL

- A. Do not use units of material with defects which impair the quality of the Work and units which are too small to fabricate the Work with minimum joints or with optimum joint arrangement.
- B. Install Work accurately to required lines and levels with members plumb and true, accurately cut and fitted and securely fastened. Closely fit rough carpentry to other associated construction.
- C. Securely attach carpentry Work to substrates by anchoring and fastening as indicated or, if not indicated, as required by the referenced standards. Select fasteners of size that will not penetrate through members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required. Set nail heads in exposed Work which is to be painted or stained and fill resulting holes.
- D. Treated Wood: Apply heavy brush coat of treatment material to field cut surfaces.

3.3 WOOD FRAMING (where applicable)

- A. Install framing members of nominal sizes indicated or of units built-up to dimensions indicated, on spacings shown. Unless otherwise indicated, comply with the recommendations of the AFPA “Manual for Wood Frame Construction”. Construct required openings for installation of related work. Do not splice structural members between supports.
- B. Anchor and nail members as indicated. If not indicated, comply with the “Recommended Nailing Schedule - Table 1” of the “Manual for Wood Frame Construction” and other applicable recommendations of the AFPA.
- C. Install miscellaneous blocking and framing indicated and as required for attachment and support of facing materials, fixtures, specialty items, and trim.

3.4 WOOD NAILERS, BLOCKING, AND GROUNDS

- A. Install required items where indicated and where required for support, attachment or screeding of other Work. Form to shapes indicated or required. Coordinate locations and cut and shim as required to provide items at true and level planes to receive Work to be attached. Install closure strips for nailers at all edges.

3.5 PLYWOOD SHEATHING, SUBFLOORING, AND UNDERLAYMENT (where applicable)

- A. Comply with printed installation requirements of the APA Design/ Construction Guide, Residential & Commercial for plywood application required, unless otherwise indicated.
- B. Plywood Underlayment: Install underlayment just prior to installation of finish flooring. Stagger end joints between panels in relation to each other and stagger all joints in relation to substrate jointing. Allow 1/32 inch space between panel ends and edges for expansion. Fasten in accordance with APA recommendations. Prior to installation of finish flooring, patch damaged areas wider than 1/16 inch. Set nails 1/16 inch, but do not fill. Sand rough areas smooth and uneven joints flush.

3.6 PARTICLEBOARD UNDERLAYMENT (where applicable)

- A. Install underlayment in accordance with National Particleboard Association recommendations for the type of subfloor condition. Fasten to subflooring in accordance with APA recommendations. Patch and sand gouges, gaps, and chipped edges. Sand uneven joints flush.
 - 1. Nail underlayment to subflooring.

3.7 WOOD FURRING

- A. Install members plumb and level with closure strips at all edges. Shim with wood as required to achieve tolerance specified.
1. Fastening: Attach to substrates as indicated; if not indicated, attach material as specified for nailers and blocking.
 2. Tolerance: Shim and level wood furring to a tolerance of 1/8 inch in 10 feet.
 3. Firestop furred spaces on walls at each floor level, with wood blocking or other approved non-combustible materials. Fit members accurately to close furred spaces.
 4. Furring to Receive Plywood Paneling: Unless otherwise indicated, 1 x 3 inch furring at 2 feet oc, horizontally and vertically.
 5. Furring to Receive Gypsum Drywall: Unless otherwise indicated, 1 x 2 inch furring at 16 inches oc, vertically.
 6. Furring to Receive Plaster Lath: Unless otherwise indicated, 1 x 2 inch furring at 16 inches oc, vertically.
 7. Suspended Furring: Size and spacing indicated, including hangers and attachment devices.

3.8 FLOOR SLEEPERS (where applicable)

- A. Unless otherwise indicated, install 3 x 3 inch strips, 12 inches oc and across abutting walls and restricting features. Anchor to slab with sleeper anchors 16 inches oc. Shim level to required height with redwood wedges 8 inches oc. Fill space between sleepers and floor slab solid with 1 part Portland cement and 2-1/2 parts sand mortar.

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 07 21 00

INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall furnish all labor, materials, equipment and incidentals as required to provide insulation as shown and specified.
2. The extent of each type of insulation Work is shown on the Contract Drawings or specified herein.
3. The types of insulation required include the following:
 - a. Fiberglass batt insulation at ceiling joists.
 - b. Polystyrene insulation.

B. Related Work Specified Elsewhere:

1. Section 042010, Unit Masonry Construction.
2. Section 061000, Rough Carpentry.

1.2 QUALITY ASSURANCE

- A. Design Criteria: Thermal Conductivity: The thicknesses shown are for the thermal conductivity, k-value at 75 degrees F., specified for each material. Provide adjusted thicknesses as directed for the use of material having a different thermal conductivity.
- B. Requirements of Regulatory Agencies: Comply with fire-resistance and flammability ratings as shown and specified; and comply with applicable requirements of the New York State Uniform Fire Prevention and Building Code.
- C. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:
 1. ASTM C518, Thermal Conductivity of Materials by Means of Heat Flow Meter.
 2. ASTM D2842, Water Absorption of Rigid Cellular Plastics.

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

3. ASTM E84, Surface Burning Characteristics of Building Materials.
4. ASTM E119, Fire Tests of Building Construction and Materials.
5. FS HH-I-521F, Mineral Fiber, Insulation Blanket.
6. FS HH-I-558B, Thermal Insulation.
7. FS HH-I-574B, Insulation, Thermal (Perlite).
8. ASTM E2178 Standard Test Method for Air Permeance of Building Materials - leakage rates less than 0.001 L/s/m² at a test pressure of 75 Pa.
9. ASTM E283 Standard Test Method for Determining Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors under specified Pressure differences across the specimen. Results were <0.02 L/s/m².
10. 10.ASTM E2357 Standard Test Method for Determining Air Leakage of Air Barrier Assemblies - no leakage.
11. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference - no leakage.
12. 2009 International Building Code (IBC) Section 2603
13. ICC-ES ESR-1659
14. THERMAX™ products are covered under Underwriters Laboratories Inc. (UL) File R5622.

D. Reference standards for rigid insulation:

1. THERMAX™ Sheathing meets ASTM C1289 – Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board, Type I, Class 2. Applicable standards include:
 - a. C203 – Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.
 - b. C209 – Standard Test Methods for Cellulosic Fiber Insulating Board,

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

- c. C518 – Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus,
- d. D1621 – Standard Test Method for Compressive Properties of Rigid Cellular Plastics,
- e. D2126 – Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging,
- f. E96 – Standard Test Method for Water Vapor Transmission of Materials,
- g. D1623 – Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics

1.3 SUBMITTALS

- A. Manufacturer's Data: Submit for approval copies of manufacturer's specifications and installation instructions for each type of insulation required. Include data substantiating that the materials comply with specified requirements.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials: Deliver all materials in unopened, undamaged original packaging bearing the manufacturer's labels.
- B. Storage of Material:
 - 1. Protect insulation materials from becoming wet or soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.
 - 2. Handle all materials with proper care to prevent damage from any source.
 - 3. Insulation must be kept dry at all times. If stored outside, raise insulation aboveground or roof level on pallets and cover with a tarpaulin or other waterproof material. Plastic wrapping installed and they should not be used as outside storage covers.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fiberglass Insulation:
 - 1. Fiberglass insulation shall be installed within ceiling as shown and indicated on dwgs.

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

2. Insulation shall conform to Federal Specification HH-I-521F, Type II, Class A.
3. Insulation shall have a minimum R value as indicated on dwgs and shall include a vapor barrier at ceiling side only.
4. Insulation shall be secured in place with galvanized T-50 staples as recommended by the insulation manufacturer. Vapor barrier shall be towards the interior of the building. Insulation shall be stored in a dry place and shall be protected from the weather at all times.
5. Manufacturer:
 - a. Johns Manville
 - b. Or equal

B. Wall Batt Insulation

1. The insulation system shall have a minimum thickness of 2 inches and an “R” value as indicated on dwgs.
 - a. Product and Manufacturer: Batt Insulation shall be manufactured by:
 - 1) Owens Corning
 - 2) Or approved equal.

C. Polyiso Rigid Insulation

1. 2” rigid insulation or as otherwise indicated on drawings.
2. R value of R-10 as indicated on drawings for equipment room.
3. Glass-fiber-infused polyisocyanurate foam core laminated between 1.0 mil smooth, reflective aluminum facers on both sides.
4. Product and Manufacturer:
 - a. Dow Chemical, THERMAX sheathing

PART 3 - EXECUTION

3.1 INSPECTION

- A. Contractor shall examine the substrate and conditions under which the insulation Work is to be performed, and notify the Engineer in writing of unsatisfactory conditions. Do not proceed with the insulation Work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.

3.2 INSTALLATION

A. General:

- 1. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specific recommendations before proceeding with the work.

3.3 INSPECTION AND ACCEPTANCE

- A. Insulation which has become wet, damaged, or deteriorated, as determined by the Engineer, shall be promptly removed from the job.

++ END OF SECTION ++

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SECTION 07 26 13

VAPOR RETARDER UNDER SLABS ON GRADE

PART 1 – GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 03 30 00, Cast-In-Place Concrete

1.2 REFERENCES

- A. Standard Referenced in this Section are:

1. ASTM D 882 Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
2. ASTM D 1709 Standard Test Methods of Impact Resistance of Plastic Film by the Free-Falling Dart Method.
3. ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials.
4. ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs.
5. ASTM E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
6. ASTM E 1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil Or Granular Fill Under Concrete Slabs.

1.3 SUBMITTALS

- A. Product Data: Catalog sheets, specifications, and installation instructions for each material specified.

1. Samples:
 - a. Vapor Retarder Material: 12 inches square.
 - b. Pressure-Sensitive Tape: 36-inch-long piece minimum.

PART2 – PRODUCTS

2.1 MATERIALS

- A. Vapor Retarder: Extruded single-ply or multi-ply type; polyethylene or polyolefin.
 - 1. Water-Vapor Permeance (ASTM E 96 or ASTM E 154): 0.04 perms or less.
 - 2. Class Rating (ASTM E 1745): A.
 - 3. Tensile Strength (ASTM E 154 or ASTM D 882): 45 lbf./in. or higher.
 - 4. Puncture resistance (ASTM D 1709): 2200 g or higher.
 - 5. Thickness: 10 mils minimum.
 - 6. Acceptable Products:
 - a. “Moistop Ultra 10” by Fortifiber Building Systems Group.
 - b. “Vapor Block 10” by Raven Industries, Inc.
 - c. “Stego Wrap 10-Mil Vapor Barrier” by Stego Industries, LLC.
 - d. “Perminator 10 Mil Underslab Vapor-Mat” by W. R. Meadows, Inc.
- B. Pressure-Sensitive Tape/Adhesive: Vapor retarder manufacturer’s standard or recommended materials.
- C. Pipe Boots: Vapor retarder manufacturer’s standard pipe boots, or construct pipe boots from vapor retarder material, pressure-sensitive tape and/or adhesive, in accordance with vapor retarder manufacturer’s instructions

PART 3 - EXECUTION

3.1 PREPARATION

- D. Surface Preparation: Rake, trim, and tamp surfaces over which vapor retarder is to be installed to true planes and as required to make a surface that will not puncture the vapor retarder material.

3.2 INSTALLATION

- A. Install vapor retarder in accordance with manufacturer's printed instructions and ASTM E 1643. Lap seams and joints a minimum of 6 inches and seal with adhesive or pressure-sensitive tape.
- B. Lap vapor retarder over footings and seal to foundation walls.
- C. Seal penetrations, including pipes, with pipe boots.

3.3 PROTECTION

- A. Protect vapor retarder as required so that it will be in sound condition, free from punctures and tears, at the time the concrete is placed.

3.4 REPAIR

- A. Repair tears and punctures with a piece of vapor retarder material, overlapping the tear or puncture a minimum of six inches on all sides, and completely seal edges with pressure-sensitive tape or adhesive.

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 07 28 00

WATER RESISTIVE BARRIER AND AIR BARRIER

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01 33 00, Submittal Procedures
- B. Section 01 74 00, Cleaning and Waste Management
- C. Section 06 10 00, Rough Carpentry

1.2 DEFINITIONS

- A. Section includes vapor-permeable, fluid-applied air and water barriers.
- B. Weather Barrier: A combination of materials and accessories that do the following:
 - 1. Prevent the accumulation of water as a water-resistive barrier.
 - 2. Minimize the air leakage into or out of the building envelope as a continuous air barrier.
 - 3. Provide sufficient water vapor transmission to enable drying as a vapor permeable membrane.

1.3 REFERENCES

- A. Water-Resistive Barrier: A combination of materials and accessories that prevent the accumulation of water within the wall assembly in accordance with IBC Section 1403.2.
 - 1. Primary Layer: Water-resistive barrier (fluid-applied) installed closest to building interior with all flashings and terminations integrated to this layer.
- B. Continuous Air Barrier: The combination of interconnected materials, assemblies, and sealed joints and components of the building envelope that minimize air leakage into or out of building envelope in accordance with ASHRAE 90.1 Section 5.4.3.1.
- C. Vapor-Permeable Membrane: The property of having a water-vapor permeance rating of 10 perms or greater, when tested in accordance with the desiccant method using Procedure A of ASTM E 96 in accordance with definition in

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

International Building Code. Vapor-permeable material permits passage of moisture vapor through vapor diffusion.

D. Conformance to test parameters:

1. ASTM E2357 Section A2.2.1.2 Specimen 2 for penetrated assemblies.
 - a. ASTM E 331 Test Parameters.
 - b. AAMA 501.1 Test.
 - c. ASTM E 330 Test
 - d. AAMA 501.5 Test Parameters:

1.4 SUBMITTALS

A. Product Data:

1. For weather barrier, include data on air and water-vapor permeance based on testing in accordance with referenced standards.
2. Catalog sheets, specifications, and installation instructions for each material specified.

B. Sustainable Design Submittals (where applicable)

1. Test Reports: Envelope testing and verification of the following:
 - a. Water-Spray Test.
 - b. Air Infiltration Test.
 - c. Water Penetration Test.
2. Product Data: Including the following information:
 - a. Provide Health Product Declarations (HPDs).
 - b. Provide Environmental Product Declarations (EPD's).
 - c. SDS (formerly MSDS), third-party certifications, or product technical data confirming systems that meet or exceed emissions guidelines for volatile organic compounds (VOCs) and hazardous air pollutants (HAPs), as follows:
 - 1) Commercial weather barrier complies with California Department of Public Health (CDPH) Standard.

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

- 2) Adhesives and sealants wet-applied on-site that meet/exceed VOC content requirements for wet applied products comply with SCAQMD Rule 1168.
 - 3) Flashing systems comply with SCAQMD Rule 1168 on VOC limits.
- C. Preconstruction Laboratory Mockup Testing Submittals: (where applicable as approved by Architect)
1. Owner/Architect's representative in a third-party testing program: Develop specifically for Project.
 2. Test Reports: Prepared by a qualified preconstruction testing agency for each mockup test.
 3. Record Drawings: As-built drawings of preconstruction laboratory mockups showing changes made during preconstruction laboratory mockup testing.
- D. Shop Drawings:
1. Show details of weather barrier at terminations, openings, and penetrations.
 2. Show details of weather barrier applications.

1.5 INSTALLATION

- A. Manufacturer's Instructions: For installation of each product specified.
- B. Qualification Data: For Installer and laboratory mockup testing agency and field testing agency.
- C. Sample Warranty: For manufacturer's warranty.
- D. Reports: Field test and inspection reports.
- E. Installer's weather barrier manufacturer training certificate.
- F. Shop Drawings:
 1. Show details of weather barrier at terminations, openings, and penetrations.
 2. Show details of weather barrier applications.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is certified by weather barrier system manufacturer to install manufacturer's product.
- B. Laboratory Mockup Testing Agency Qualifications: Qualified in accordance with ASTM E 699 for testing indicated and accredited by IAS or ILAC Mutual Recognition Arrangement as complying with ISO/IEC 17025].
- C. Mockups: (where applicable as approved by Architect) Build mockups to set quality standards for materials and execution.
 - 1. Build integrated mockups of exterior wall assembly as indicated on dwgs, incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.
 - a. If Architect determines that mockups do not comply with requirements, reconstruct mockups and apply weather barrier until mockups are approved.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- D. Preconstruction Laboratory Mockups: (where applicable as approved by Architect)
 - 1. Preconstruction Testing Service: Owner/Architect's representative will engage a qualified testing agency to perform testing on preconstruction laboratory mockups.
 - 2. Manufacturer's Field Service: Register Project with weather barrier manufacturer prior to installation of weather barrier and comply with weather barrier manufacturer's Project Registration and Observation process.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.
- C. Store in a dry environment between 50 and 80 deg F.

1.8 WARRANTY

- A. Manufacturer's Product Warranty: Manufacturer agrees to repair or replace weather barrier product that fails in materials within specified warranty period.
 - 1. Warranty Period: 10 years from date of product purchase.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- 1. DuPont Safety & Construction: E. I. du Pont de Nemours and Company, Rochester, NY www.dupont.com
- 2. W.R. Meadows Sealtight Air Shield LMP., water-based air/liquid moisture barrier.
- 3. WR Meadows, Inc. PO Box 338 Hampshire, Ill. www.wrmeadows.com

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed weather barrier and accessories shall withstand specified wind pressures, liquid water penetration, and water vapor pressures, without failure due to defective manufacture of products.
- B. High-Performance Installations:
 - 1. For installation with one of the following building envelope performance or structural characteristics:
 - a. Exceeding 65 mph equivalent structural load.
 - b. Exceeding 15 mph equivalent wind-driven rain water infiltration.
 - c. Buildings with 60 feet or more total height above grade plane, as defined by the IBC.

- d. Construction with gypsum or cement-based exterior sheathing.
 - e. Non-wood based primary structure such as steel, light-gauge steel, masonry, or concrete.
- C. Basis-of-Design Product: DuPont Safety & Construction: E. I. du Pont de Nemours and Company; Tyvek® Fluid Applied WB+™ or comparable product by one of the following:

W.R. Meadows Sealtight Air Shield LMP., water-based air/liquid moisture barrier.

- 1. Solids Content, %: 58
- 2. Color: Gray
- 3. (Black – special order only)
- 4. Flexibility @ -26° C (-15° F),PASS
- 5. (ASTM C 836):
- 6. Elongation (ASTM D 412), %: 1300
- 7. Water Vapor Permeance 12
- 8. (ASTM E 96, Procedure B) Perms:
- 9. Service Temperature: Not to exceed 175° F
- 10. (80° C)
- 11. Nail Sealability (ASTM D 1970): Pass
- 12. Storage Temperature 40 – 90° F (4 – 32° C)
- 13. Air/Substrate Temperature (At Time of Application): >20° F (-6.7° C)
- 14. Air leakage Test Method ASTM E 2178 ASTM E 2357
- 15. Pressure 75 Pa
- 16. (1.57 lb./ft.2) 75 Pa
- 17. (1.57 lb./ft.2)
- 18. ABAA Requirements 0.004 cfm/ft.2 (0.02 L/S/M2)0.04 cfm/ft.2

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

- 19. (0.2 L/S/M2)
- 20. AIR-SHIELD LMP Results <0.004 cfm/ft.2 (0.02 L/S/M2) <0.04 cfm/ft.2
- 21. (0.2 L/S/M2)
- D. Fluid-Applied Membrane: ASTM E 2357 passed, Air Barrier Association of America (ABAA) evaluated air barrier assembly, and assembly water resistance in accordance with ASTM E 331; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested in accordance with ASTM E 84; UV stabilized for nine-month exposure; and acceptable to authorities having jurisdiction.

2.3 WEATHER BARRIER FLASHING

- A. Basis-of-Design Product: DuPont Safety & Construction: E. I. du Pont de Nemours and Company; FlexWrap™ NF or comparable product by one of the following:
 - 1. WR Meadows
- B. Conformability: Able to create a seamless sill pan extending up the jambs without cuts, patches, or fasteners. ASTM E 331 applies to water penetration testing of exterior windows, skylights, doors, and curtain walls.
- C. Water Penetration: No leakage at 15 psf (720 Pa) in accordance with ASTM E 331.
- D. Low Temperature Adhesion: Exceeds minimum value of 1.5 lb./in. (0.26N/mm) at 25 deg F (-4 deg C) as Class A (without primer use).
- E. Adhesion After Water Immersion: Exceeds minimum value of 1.5 lb./in. (0.26N/mm), after AAMA 800, Sections 2.4.1.3.1/2.4.1.4.3 Test B.
- F. Strip Flashing: Composite flashing material composed of spunbonded polyethylene laminate with a 100 percent butyl-based adhesive layer; AAMA 711, Class A (no primer), Level 3 thermal exposure of 176 deg F (80 deg C) for seven days.
- G. Basis-of-Design Product: DuPont Safety & Construction: E. I. du Pont de Nemours and Company; Tyvek® StraightFlash™ Tyvek® StraightFlash™ VF] or comparable product by one of the following:
 - 1. WR Meadows
- H. Water Penetration: No leakage at 15 psf (720 Pa) in accordance with ASTM E 331.

- I. Low Temperature Adhesion: Exceeds minimum value of 1.5 lb./in. (0.26N/mm) at 25 deg F (-4 deg C) as Class A without primer use.
- J. Adhesion After Water Immersion: Exceeds minimum value of 1.5 lb./in. (0.26N/mm), after AAMA 800, Sections 2.4.1.3.1/2.4.1.4.3 Test B.
- K. Primer for Flashings: Synthetic rubber-based product. Spray applied. Strengthen the adhesive bond at low temperature applications between weather products, such as self-adhered Flashing Products, Commercial Building Wraps, and common building sheathing materials.
- L. Basis of Design Product: DuPont Safety & Construction: E. I. du Pont de Nemours and Company; DuPont™ Adhesive Primer or comparable product by one of the following.
 - 1. WR Meadows
- M. Peel Adhesion Test: Passes ASTM D 3330, Test Method F, for the following:
 - 1. Peel Angles: 0, 25, 72, and 180 degrees.
 - 2. Substrates: Concrete masonry units (CMU), exterior gypsum sheathing, oriented strand board (OSB), aluminum, and vinyl.
- N. Chemical Compatibility per AAMA 713: Pass.
- O. Flame Spread Index per ASTM E 84: 5.
- P. Smoke Development Index per ASTM E 84: 0.

2.4 FLUID APPLIED FLASHING AND SEALANT (where applicable)

- A. Fluid Applied Flashing: Trowel or brush applied, non-water soluble, single component, silyl terminated polyether technology (STPE), vapor permeable, flashing material.
 - 1. Basis-of-Design Product: DuPont Safety & Construction: E. I. du Pont de Nemours and Company; Tyvek® Fluid Applied Flashing and Joint Compound+ or comparable product by one of the following:
 - a. WR Meadows
 - 2. VOC Content: ASTM C 1250, less than 2 percent by weight and less than 30 g/L.
 - 3. Water Vapor Transmission: ASTM E 96, Method B, greater than 20 perms at 25 mils (0.64 mm) thick.
 - 4. Minimum Tensile Strength: ASTM D 412, 165 psi (1140 kPa).

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

5. Minimum Elongation at Break: ASTM D 412, 360 percent.
- B. Fluid Applied Sealant: ASTM C 920
1. Extension-Recovery/Adhesion per ASTM C 736: 100 percent recovery.
 2. Accelerated Weathering/Low Temperature Flexibility per ASTM C 793: Pass.
 3. VOC Percentage by Weight per ASTM C 1250: Less than 2 percent.
 4. VOC per ASTM C 1250: Less than 30 g/L.

2.5 DRAINAGE LAYER

- A. Drainage Layer: Weather barrier membrane with drainage.
1. Basis-of-Design Product: DuPont Safety & Construction: E. I. du Pont de Nemours and Company; Tyvek® Fluid Applied WB+™ and CommercialWrap® D or comparable product by one of the following:
 - a. WR Meadows
 2. Drainability: 98 percent or greater when tested in accordance with ASTM E 2273.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
 2. Verify that substrates have cured and aged for minimum time recommended in writing by weather barrier manufacturer.
 3. Verify that substrates are visibly dry and frost-free.
 - a. Fluid-applied weather barrier may be applied to damp surfaces.
 - b. Surfaces are considered damp if there is no visible water on the surface, and no transfer of water to the skin when touched.
 - c. Apply accessory products only to clean and dry surfaces.

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

4. Verify that substrates are free of efflorescence and mold.
 5. Verify that masonry joints are flush and filled with mortar.
 6. Verify that top-of-wall system has been capped or covered to prevent water getting behind the facade and into wall cavity.
 7. Verify continuous path for moisture drainage.
 - a. Verify that continuous path for drainage is not blocked or disrupted, which results in excess moisture buildup in wall cavity.
 8. Verify that surfaces to receive weather barrier are above grade.
- B. Verify that substrate and surface conditions are in accordance with commercial weather barrier manufacturer recommendations prior to installation.
1. Verify that rough sill framing for doors and windows slopes downward towards the exterior and is level across width of opening.
- C. Verify air and surface temperatures are above 25 deg F (4 deg C) with a maximum surface temperature of 140 deg F (60 deg C). Do not install once ambient temperature exceeds 95 deg F (35 deg C), unless surface is shaded.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate in accordance with manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- C. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.
- D. Remove excess mortar from masonry ties, shelf angles, and other obstructions. (where applicable)
- E. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- F. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

- G. When spraying is method of application, taper ends of the joint treatment to assist maintaining a wall system free of pinholes and voids.
- H. Treat all non-moving transition joints to beams, columns, and dissimilar materials by applying a 2-inch- (50-mm-) wide by 60-mil- (1.5-mm-) thick coat of fluid-applied flashing across the joint.
- I. Apply 25-mil- (0.6-mm-) thick coat of fluid-applied flashing, extending a minimum 2 inches (51 mm) on each surface, and treat the following conditions:
 - 1. Joints up to 1/4 inch (6 mm).
 - 2. Joints 1/4- to 1/2-inch (6- to 13-mm); reinforce with fiberglass-mesh tape.
 - 3. Joints and transitions up to 1 inch (25 mm); treat using strip flashing.
- J. Bridge [isolation joints] [expansion joints] [and] discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement in accordance with manufacturer's written instructions and details.
- K. When spraying is method of application, taper ends of fluid applied corner treatment to wall substrate.
- L. Treat inside and outside corners by applying a 25-mil- (0.6-mm-) thick coat of fluid applied weather barrier a minimum 2 inches (50 mm) on each adjoining surface. Apply fillet bead of fluid-applied sealant to inside corners to ensure continuity. Alternatively, treat corners using strip flashing. Press strip flashing into inside corners; ensure that it is fully adhered to substrate.
- M. Seal penetrations using fluid-applied flashing or sealant. Extend fillet bead 1/2 inch (13 mm) onto both surfaces.
- N. Treat embedded masonry anchors by applying a coat of fluid-applied weather barrier or fluid-applied flashing around base of the anchor.

3.3 ACCESSORIES INSTALLATION (where applicable and indicated on drawings)

- A. Install accessory materials in accordance with air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.
 - 1. Coordinate installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 - 2. Install transition strip on roofing membrane or base flashing, for a minimum 3 inches (75 mm) coverage over each substrate.

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow to dry.
 4. Use recommended primer when applying self-adhered flashing products on concrete, masonry, and fiber faced exterior gypsum board substrates. Priming is generally not required for adhering self-adhered flashing products to wood. However, adverse weather conditions or colder temperatures may require a primer to promote adhesion. Priming is not required when applying fluid-applied products, except on cut edges of exterior gypsum sheathing.
 5. Apply pressure along entire surface of strip flashing for good bond using a J-roller or firm hand pressure. Remove all wrinkles and bubbles by smoothing surface and repositioning as necessary.
- B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- C. When applying self-adhered flashing products over a cured fluid-applied membrane, first apply a wet bed of fluid-applied product.
- D. Seal fasteners of mechanically attached supports or furring strips in high-performance building envelope designs.
1. Apply double-sided butyl tape to back of support bracket at fastener location.
 2. Embed support bracket into an additional wet bed of fluid applied product.
 3. Adhere butyl-based flashing patch to wall at fastener location.
 4. Use alternate method as approved by the manufacturer.
- E. At end of each working day, seal top edge of strips and transition strips to substrate with manufacturer approved product.
- F. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Flashing Sill Area for Windows and Doors: (where applicable and as indicated on dwgs)
1. Use 6-inch- (150-mm-) wide conformable flashing for 2- by 4-inch (50- by 100-mm) framing and 9-inch- (220-mm-) wide conformable flashing

for 2- by 6-inch (50- by 150-mm) framing. When rigid back dams are required or desired, one option to use is a 3/4-inch (19 mm) corner guard (back dam), cut to length of sill, and nailed into place on interior edge of sill prior to installation of 9-inch- (220-mm-) wide conformable flashing. Afterward, install 9-inch- (220-mm-) wide conformable flashing over sill and corner guard back dam.

2. Install without stretching conformable flashing when installing along sills or jambs. Conformable flashing is intended to be stretched when covering corners or curved sections.
- H. Apply fluid-applied flashing products from head of opening down. Use a corner trowel to smooth corners.
- I. Repairs:
1. Coat small damaged areas with layer of fluid-applied product.
 2. Reinforce large damaged areas with fiberglass mesh or replace damaged substrate before reapplying fluid-applied product.

3.4 PRIMARY AIR-BARRIER MATERIAL INSTALLATION

- A. Apply air-barrier material to form a seal with strips and transition strips, and to achieve a continuous air barrier in accordance with air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.
1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 3. Where multiple prime coats are needed to achieve required bond, allow adequate drying time between coats.
 4. Fluid applied products may be overcoated once a touch-free skin has formed. Exterior insulation and cladding may be installed once the membrane has cured sufficiently to resist damage during installation.
- B. Apply air barrier material in accordance with air-barrier manufacturer's written instructions and recommendations. (where applicable)
1. Roller Application:
 - a. Nap rolling: Use a roller cover with a 1/2- to 3/4-inch (13- to 19-mm) nap.

2. Spray Application:
 - a. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
 - b. Use spray guard.
 - c. Back Rolling: Use a roller cover with a 1-1/2- to 3/4-inch (13- to 19-mm) nap. Apply fluid-applied product in a single coat at 25 mils (0.64 mm) thick. Control thickness by applying appropriate volume over a marked area and spot checking with a wet-mil gauge.
- C. Integrate fluid-applied product with through-wall flashing and window and door flashing by overlapping flashing with fluid-applied product a minimum 2 inches (50 mm).
- D. Inspect surfaces to ensure that fluid-applied products are continuous and free of any voids or pinholes.
- E. Do not cover air barrier until it has been tested and inspected by the testing agency.
- F. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

- A. ABAA Quality Assurance Program: Perform examinations, preparation, installation, testing, and inspections under ABAA's Quality Assurance Program.
- B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements.
 1. Continuity of air-barrier system has been achieved throughout the building envelope without gaps, holes, or pinholes.
 2. Air-barrier dry film thickness.
 3. Continuous structural support of air-barrier system provided.
 4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
 5. Site conditions for application temperature, and dryness of substrates are maintained.
 6. Maximum exposure time of materials to UV deterioration not exceeded.

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

7. Surfaces primed, where applicable.
 8. Laps in strips and transition strips comply with minimum requirements, are shingled in correct direction (or mastic applied on exposed edges), and are without fishmouths.
 9. Termination mastic applied on cut edges.
 10. Strips and transition strips firmly adhered to substrate.
 11. Compatible materials used.
 12. Transitions at changes in direction and structural support at gaps provided.
 13. Connections between assemblies (air-barrier and sealants) comply with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
 14. Each penetration sealed.
- C. Field Quality Control Testing: (where applicable as approved by Owner/Architect's representative) Perform the following tests:
1. Air Infiltration Whole Building: ASTM E 779 at not more than [0.40 cfm/sf (2.00 L/s per sq. m)] [0.25 cfm/sf (1.25 L/s per sq. m)] [0.15 cfm/sf (0.75 L/s per sq. m)] at 1.57 lb/sq. ft. (75 Pa).
 2. Water Penetration: ASTM E 1105 at a minimum [uniform] [and] [cyclic] static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article in Part 2, but not less than [2.86 lbf/sq. ft. (137 Pa)] [6.24 lbf/sq. ft. (300 Pa)] [10.4 lbf/sq. ft. (500 Pa)] [12.5 lbf/sq. ft. (600 Pa)]. No water penetration shall occur as defined in ASTM E 1105.
 - a. Perform a minimum of two tests in areas as directed by Architect. (where applicable)
 - b. Perform tests in each test area as directed by Architect. Perform a minimum three tests, prior 70 percent completion.
 3. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate in accordance with ASTM D 4541 for each [600 sq. ft. (56 sq. m)] of installed air barrier or part thereof.
- D. Air barriers will be considered defective if they do not pass tests and inspections.

1. Apply additional air-barrier material, in accordance with manufacturer's written instructions, where inspection results indicate insufficient thickness.
 2. Remove and replace deficient air-barrier components for retesting as specified above.
- E. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
- F. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, in accordance with manufacturer's written instructions.
1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials in accordance with air-barrier manufacturer's written instructions.
 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.
- C. Remove masking materials after installation.

++ END OF SECTION ++

SECTION 07 40 00

ALUMINUM SOFFITS FASCIAS, AND WALL PANELS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. The General Contractor shall furnish all labor, materials, equipment for a complete installation of aluminum soffits and fascias, and related work shown on drawings and specified herein.

B. Coordination: Review installation procedures under other Sections and coordinate the installation of items that must be installed with the aluminum soffits and fascias work.

C. Related Work Specified Elsewhere:

1. Section 06 10 00, Rough Carpentry
2. Section 07 71 00, Manufactured Roof Specialties
3. Section 07 92 00, Joint Sealants

1.2 QUALITY ASSURANCE

A. Installer Qualifications:

1. The installer shall be skilled and experienced in the type of aluminum siding work required, and equipped to perform workmanship in accordance with recognized standards.

B. Reference Standards: Comply with applicable provisions and recommendations of the New York State Code reference standards, as well as the indicated manufacturer's specifications, standards and recommendations.

1.3 SUBMITTALS

A. Samples: Submit for approval 12-inch long sample of specified soffit and fascia.

B. Shop Drawings: Submit for approval the following:

1. Shop drawings shown in the method and details of erection.
2. Copies of manufacturers Specifications.

1.4 PRODUCT DELIVERY AND HANDLING

- A. Delivery of Materials: Deliver soffits and fascia boards to job in manufacturers original, unopened containers with labels intact and legible.
- B. Storage of Materials:
 - 1. Store materials in an area protected from construction traffic.
 - 2. Store materials in same package in which they were shipped.
- C. Handling Materials: Protect materials from dents, scratches, warps or bends.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Soffit: Fully vented soffit.
- B. Fascia: Solid aluminum fascia panels.
- C. Wall Panels: Vertical 8” wide.
- D. Accessories:
 - 1. J-Channel, F-Channel and trim.
- E. Colors: To be chosen by the Owner.
- F. Product and Manufacturer:
 - 1. Atlas International, Inc.
 - 2. Or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Prior to commencing work, verify governing dimensions of buildings; examine, clean and repair, if necessary, any adjoining work on which this work is in any way dependent for its proper installation.

- B. The field application of soffit, fascia, wall panels, and trim members shall be in accordance with the best practice, with all joint members true and plumb.
- C. Soffit, fascia, wall panels and accessories shall be installed in accordance with the latest edition of the manufacturer's installation manual.
- D. Items not covered in this specification - as indicated on drawings or as required shall be provided for a complete installation.

3.2 WARRANTY

- A. Manufacturer to provide a lifetime limited warranty on the quality of materials.
- B. No service charge to inspect complaints.

++ END OF SECTION ++

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SECTION 07 41 10
ALUMINUM ROOF PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Metal roofing, including flashing and accessories.
- B. Metal wall and fascia panels.
- C. Metal soffit panels.

1.2 RELATED SECTIONS

- A. Section 07 40 00, Aluminum Soffits, Fascias, and Wall Panels
- B. Section 07 71 00, Manufactured Roof Specialties
- C. Section 07 92 00, Joint Sealants

1.3 REFERENCES

- A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2001a.
- B. ASTM A792 / A792M - Standard Specification for Steel Sheet, 55 percent Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- C. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2001.
- D. ASTM E 283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 1991 (Reapproved 1999).
- E. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000.
- F. ASTM E 408/C - 1371: "Standard Test Method for Total Normal Emittance of Surfaces Using inspection - Meter Techniques.
- G. ASTM E 903/C - 1549: Standard Test Method for Solar Absorbance, using Integrating Spheres.

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

- H. ASTM E 1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference; 1995.
- I. ASTM E 1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems; 1995.
- J. Dade County County (Florida) Acceptance Report Numbers: 01-1106-01 and 01-1106-02.
- K. FM - Tests Requirements for Class 1 Panel roofs, Factory Mutual Research Corporation.
- L. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies; 1994.
- M. UL2218: Class 4 Impact Resistance Rating.
- N. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors National Association; 1993.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00, Submittal Procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors and textures.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Operation and Maintenance Data: Include methods for maintaining installed products and precautions relating to cleaning materials and methods that might be detrimental to finishes and performance.
- H. Close Out: Warranty documents specified herein.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Installer with documented experienced in performing work of this section who has specialized in the installation of work similar to that required for this project.
- B. Pre-Installation Meeting: Conduct pre-installation meeting to acquaint installers of roofing and related work with project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging with identification labels intact until ready for installation.
- B. Store materials protected from exposure to harmful conditions. Store material in dry, above ground location.
 - 1. Stack pre-finished material to prevent twisting, bending, abrasion, scratching and denting. Elevate one end of each skid to allow for moisture to run off.
 - 2. Prevent contact with material that may cause corrosion, discoloration or staining.
 - 3. Do not expose to direct sunlight or extreme heat trim material with factory applied strippable film.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's standard warranty document executed by authorized company official covering finish, including color, fade, chalking and film integrity.
- B. Warranty Period: 20 years commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. ATAS International, Inc.,
- B. Or approved equal.

2.2 SHEET METAL ROOFING

- A. General: Factory fabricated panels; panels fabricated on site using portable roll former are prohibited.
1. Performance Requirements: Provide sheet metal roofing that has been manufactured, fabricated and installed to achieve the following performance without defects, damage, failure or infiltration of water.
 - a. Wind Uplift: Provide UL 580 Class 90 rated assembly.
 - b. FM: Test Requirements for Class 1 panel roofs.
 - c. Static Air Infiltration: 0.06 cu ft/min/sq ft (1.1 cu m/h/sq m) at 6.24 lb/sq ft (300 Pa) air pressure differential, maximum, when tested in accordance with ASTM E 283 or ASTM E 1680.
 - d. Water Infiltration: No evidence of water penetration at inward static air pressure differential of 12.0 lb/sq ft (575 kPa), when tested in accordance with ASTM E 331 or ASTM E 1646.
 - e. Thermal Movement: Accommodate movement expected due to ambient and surface temperature ranges likely to occur at project site.
 2. Panel Lengths: As indicated on drawings; panels 55 feet (16.76 m) and less fabricated in one continuous length.
 3. Texture: Smooth texture, dull matte specular gloss 25 to 35 percent at 60 degrees F (15.5 degrees C).
 4. Finish: Factory applied PAC-CLAD finish:
 - a. Topside: Full-strength fluoropolymer, 70 percent Kynar 500 or Hylar resin, 1.0 mil (0.025 mm) total dry film thickness.
 - b. Underside: Wash coat of 0.3 to 0.4 mil (0.076 to 0.1 mm) dry film thickness.
 - c. Color: As selected by Owner from manufacturer's standard colors.
 5. Panel Fasteners: Non-penetrating type, as required to achieve wind uplift rating or otherwise as recommended by manufacturer.
- B. Roof Panels: Aluminum flat panels with continuously interlocked standing seam; one-piece design without separate seam cover.
1. Seam Height: 1-1/2 inches (38 mm) minimum.

2. Material: 24 gage, 0.024 inch (0.61 mm) ASTM A792 /A792M Galvalume steel, structural quality.
3. Panel Width: 18 inch (457 mm), center to center.
4. Eave Notching: Factory produced eave notching for trimmed eave panels.
5. Sealant Bead: Factory applied sealant bead.

2.3 ACCESSORY MATERIALS

- A. Underlayment: ASTM D 226, Type II No. 30 asphalt saturated organic roofing felt.
- B. Plywood Deck: 5/8 inch (16 mm) nominal thickness; as specified in Section 06 10 00 - Rough Carpentry.
- C. Nailable Insulation: 1 inch (25 mm) minimum to 3-1/2 inch (89 mm) maximum nominal thickness classified polyisocyanurate foamed plastic, 2 pcf (32 kg/cu m) density, factory laminated to 7/16 inch (11 mm) thick APA rated oriented strand board (OSB).
- D. Sealant: Elastomeric.
- E. Bituminous Coating: Cold-applied asphaltic mastic, free of asbestos fibers, sulfur, and other harmful impurities.
- F. Touch-Up Paint: Approved by panel manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrates are acceptable for roofing installation in accordance with manufacturer's instructions.
- B. Do not begin installation until substrates have been properly prepared.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Coordinate metal roofing with other work, including but not limited to drainage, flashing and trim, deck substrates, parapets, copings, walls, and other adjoining work.

- C. Install metal roofing panels to profiles, patterns and drainage indicated, in accordance with manufacturer's instructions, and as necessary to achieve specified performance and a leak-free Installation. Allow for structural and thermal movement.
- D. Separate dissimilar metals using bituminous coating to prevent galvanic action.
- E. Use fasteners recommended by panel manufacturer; conceal fasteners wherever possible; cover and seal exposed fasteners.
- F. Provide uniform, neat seams; provide sealant-type joint where indicated and form joints to conceal sealant.

3.3 FIELD QUALITY CONTROL

- A. Post Installation Testing: Owner reserves right to perform post installation testing of installed sheet metal roofing.
- B. Manufacturer's Field Services: Upon Owner's request, provide manufacturer's field service consisting of product use recommendations and periodic site visit for inspection of product installation in accordance with manufacturer's instructions.

3.4 CLEANING

- A. Remove temporary coverings and protection of adjacent work areas.
- B. Touch-up, repair or replace damaged products.
- C. Clean in accordance with manufacturer's instructions prior to Substantial Completion.
- D. Remove construction debris from project site and legally dispose of debris.

3.5 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

++ END OF SECTION ++

SECTION 07 71 00

MANUFACTURED ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Gutters and Downspouts:

1. Gutter profiles.
2. Square/rectangular downspouts, elbows, and offsets.
3. End caps.
4. Miters.
5. Hangers for downspouts.
6. Conductor heads.

B. Related Sections:

1. Section 07 40 00, Aluminum Soffits, Fascias, and Wall Panels
2. Section 07 41 10, Aluminum Roof Panels
3. Section 07 92 00, Joint Sealants

1.2 REFERENCES

A. ASTM International (ASTM):

1. ASTM A240 - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
2. ASTM A527 - Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality.
3. ASTM A568 - Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

4. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 1. Preparation instructions and recommendations.
 2. Storage and handling requirements and recommendations.
 3. Installation methods.
- B. Shop Drawings: Include materials, details of construction and attachment to adjacent work.
- C. Verification Samples: For each product to be provided, two samples, minimum size 6 inches (150 mm) square representing actual product including thickness, color and finish.
 1. Anchors: Two, each type required.
 2. Cap Flashings: Full section, 6" long.
 3. Downspout: Full section, 12" long.
- D. Guarantee
- E. Certificates of qualifications as specified under Article titled "Quality Assurance".
- F. Product Certificates
 1. Certify that materials of this Section, such as copper/fabric flashing, sealants, termination bar, and fasteners, are compatible with all components of the air barrier system and other Project materials that contact them.

1.4 DESIGN REQUIREMENTS

- A. Conform to applicable code for size and method of rain water discharge.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All primary products specified in this section shall be supplied by a single manufacturer with a minimum of ten years' experience.
- B. Installer Qualifications: Minimum 2 years experience installing similar products.

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Store products in clean, dry, sheltered area off the ground until ready for use.
- C. Protect products from exposure to direct sunlight and rain. Handle materials to avoid damage.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results.

1.8 WARRANTY

- A. Manufacturers Product Warranty: Provide manufacturer's standard limited warranty that products are free from manufacturing defects and will not break down or deteriorate under normal conditions.
 - 1. Warranty Period: 10 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Chris Industries: 290 Larkin Ave.; Wheeling, IL 60090; Toll Free Tel: 800-356-7922 ; Tel: 847-729-9292; Fax: 847-729-0340; Web: www.chrisind.com
- B. Or approved equal

2.2 MATERIALS

- A. Materials: The products listed in this specification are made using materials listed below as applicable and as specified.
 - 1. Galvanized Flat Sheet, Paint grip: G90 galvanized steel. LFQ (lock forming quality). ASTM A527.
 - 2. Stainless Steel Flat Sheet: Alloy 304, Finish 2B, ASTM A240

2.3 SCUPPER, NOZZLE AND DOWNSPOUTS

- A. Scupper

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

- 1 Manufacturer: OMG 5 inch scupper thru wall retro drain
 - a. RAC Backflow Compression Seal - activated at drain flange level to protect the roofing system and building contents from water backup damage.
 - b. 125-in. metal clamping ring assembly provides a compression type termination for the vertical and horizontal roof flashings. Stainless steel studs and lock nuts secure the clamping ring assembly to the drain flange.
 - c. .060-in. thick drain strainer secured to the drain body with four stainless steel wing nuts
 - d. 9-in. stem

B. BRONZE DOWNSPOUT NOZZLE

1. Manufacturer: ZURN
 - a. Model ZARB199-8-PVC
1. Downspout Material:

2.4 ACCESSORIES

- A. Connectors: Furnish required connector pieces for components.
- B. Anchors and Supports: Profiled to suit downspouts.
- C. Anchoring Devices: In accordance with SMACNA requirements
- D. Downspout Supports:
- E. Fasteners: As per manufacturer's recommendations
- F. Solder: ASTM B32; Alloy Grade Sn50 type.

2.5 FASTENERS

- A. Nails "Stronghold" type large flat head roofing nail.
 1. For Copper: Hardened copper.
 2. For Stainless Steel: Stainless steel.
- B. Screws, Bolts, and other Fastening Accessories

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

1. For Copper: Copper or brass.
2. For Stainless Steel: Stainless steel type 316.

C. Anchors

Provide one of the following types:

1. Hammer driven anchors, consisting of a stainless steel drive pin and a corrosion resistant metal expansion shield inserted thru a stainless steel disc with an EPDM sealing washer.
- D. Self-tapping, corrosion resistant, concrete and masonry screw inserted thru a stainless steel disc with an EPDM sealing washer.

2.6 MISCELLANEOUS MATERIALS

A. Solder

1. Composition of block tin/pig lead of proportion recommended by the metal manufacturer, stamped either 50/50 or 60/40 "Warranted".

B. Flux

1. Paste or acid type as recommended by the metal manufacturer.

C. Bituminous Coating: FS TT-C494.

D. Type 3 Sealant (For concealed sealant joints of thru-wall cap receivers and other areas which require concealed sealant).

1. One part butyl rubber sealant; Pecora BC-158, PTI 707, or Woodmont chem-Calk 300.

E. Flashing Sealants and Adhesives (where applicable)

1. Provide products recommended in writing by the flashing manufacturer, and compatible with all adjacent materials, including components of the air barrier system. Materials containing asbestos are prohibited. Mastics and other asphaltic materials shall not be used where sealant is specified or required.
- 2.. Where low modulus silicone sealant is indicated provide ASTM C 920, single-component, neutral-curing silicone; Class 100/50, Grade NS, Use NT, Use O.

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

F. Hinged Gutter Guards

1. Width to match gutter; as manufactured by US Gutter Systems, or approved equal.

G. Splash Blocks

1. Precast sloped concrete splash block pad, 3,500 psi, approximate size 1 foot x 2 feet long.

2.7 FABRICATION

A. Form gutters, rakes, downspouts and elbows as indicated on drawings

B. Fabricate with required connection pieces.

C. Form sections to shape indicated on Drawings, square, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance.

D. Hem exposed edges of metal.

E. Downspouts

1. Materials: Plain copper or lead coated copper.
2. Components (where applicable)
 - a. Hung Gutter: 20 oz.
 - b. Downspouts: 16 oz.
 - c. Conductor Heads: 16 oz.
 - d. Outlet Tube, offsets and elbows: 16 oz.
 - e. Continuous cleats: 20 oz.
 - f. Downspout Support Hanger: 1"x1/16" brass or copper.
 - g. Wire Strainers: 18 gage copper wire, 1/2" mesh.
3. Fabrication
 - a. Fabricate gutters, downspouts and fittings to shapes and profiles indicated on Drawings; if details are not indicated, follow applicable

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

requirements of the Architectural Sheet Metal Manual of SMACNA.

- b. Form downspouts in 10'-0" long sections (where applicable).

2.7 INSTALLATION

A. Installing Thru Wall Scupper

- 1 Where protected membrane roofing is provided, scuppers shall be equipped with grilles with opening size not greater than the size of stone ballast used on the roof.
2. Lock and solder, or rivet and solder all construction joints of the scupper (where applicable).

B. Installation of Downspouts:

- 1 Join the downspout sections with end joints that telescope at least 1 1/2"
- 2 Install necessary offsets and elbows.
- 3 Install a minimum of 2 hangers at each downspout section. Form hangers to keep downspouts 1" away from wall.
- 4 Fasten downspouts to hangers with sheet metal screws.
- 5 Secure hangers to masonry and concrete walls with machine bolts in lead shields and to wood walls with screws.
- 6 Discharge Elbows: Fasten leader shoes to downspouts with a minimum of 3 sheet metal screws.
- 7 Connection to Underground Drains: Fit the downspout neatly into the drain pipe or boot. Caulk the joint with lead wool and seal with sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install products in accordance with manufacturer's recommendations, approved submittals, and in proper relationship with adjacent construction.

3.4 CLEANING AND PROTECTION

- A. Clean products in accordance with the manufacturer's recommendations.
- B. Protect installed products until completion of project.

++ END OF SECTION ++

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall provide all labor, materials, tools, equipment, and incidentals as shown, specified, and required to furnish and install caulking and sealants.
2. Extent of each type of caulking and sealant is shown or indicated and includes the following:
 - a. Interior and exterior joints in equipment and construction systems not filled by another material, and that are not required to be open for operation.
 - b. Exposed-to-view joints of all fire-rated sealants.
 - c. Joints specified to be re-caulked.

B. Coordination:

1. Review installation procedures under other Sections and coordinate installation of items to be installed with or before caulking and sealants.
2. Notify other trades in advance of installation of caulking and sealants to provide other trades with sufficient time for installing their work that must be installed before caulking and sealants.
3. Coordinate final selection of caulking and sealants so that materials are compatible with all caulking and sealant substrates specified.

1.2 REFERENCES

A. American Society of Testing Material (ASTM) Publications:

B. ASTM C510, Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants.

1. ASTM C661, Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer.

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

2. ASTM C793, Test Method for Effects of Accelerated Weathering on Elastomeric Joint Sealants.
 3. ASTM C794, Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.
 4. ASTM C920, Specification for Elastomeric Joint Sealants.
 5. ASTM C1021, Practice for Laboratories Engaged in Testing Building Sealants.
 6. ASTM C1087, Test method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.
 7. ASTM C1193, Guide for Use of Joint Sealants.
 8. ASTM C1247, Practice for Durability of Sealants Exposed to Continuous Immersion in Liquids.
- C. Federal Specifications (FS)
1. FS TT-S-00227, Sealing Compound: Elastomeric Type, Multi-component (for Caulking, Sealing, and Glazing in Buildings and Other Structures).
 2. FS TT-S-00230 Sealing Compound: Elastomeric Type, Single Component (for Caulking, Sealing, and Glazing in Buildings and Other Structures).
- D. South Coast Air Quality Management District's (SCAQMD).
1. SCAQMD Rule 1168.

1.3 QUALITY ASSURANCE

A. Qualifications:

1. Installer:

- a. Engage a single installer, approved by product manufacturer, regularly engaged in caulking and sealant installation and with successful experience in applying types of products required, and who employs only tradesmen with specific skill and successful experience in the type of Work required.

2. Testing Laboratory:

- a. Furnish services of independent testing laboratory qualified according to ASTM C1021, for conducting testing required.

B. Component Supply and Compatibility:

1. Obtain materials only from manufacturers who will, if required:
 - a. Furnish at the Site services of a qualified technical representative to advise installer of proper procedures and precautions for using materials.
 - b. Test caulking and sealants for compatibility with substrates for conformance with FS-TT-S-00227, and recommend remedial procedures as required.
2. Before purchasing each sealant, investigate its compatibility with joint surfaces, joint fillers, and other materials in joint system. Provide products that are fully compatible with actual installation condition, verified by manufacturer's published data or certification, and as shown on approved Shop Drawings and other approved submittals.
3. Product Testing: Provide test results of laboratory pre-construction compatibility and adhesion testing, as specified in Article 3.1 of this Section, by qualified testing laboratory, based on testing of current sealant formulations within a 36-month period preceding the Notice to Proceed for the Work.
4. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C920 and, where applicable, to other standard test methods.
5. Test other joint sealants for compliance using specified post-construction field adhesion test.

1.4 SUBMITTALS

A. Action Submittals: Submit the following:

1. Shop Drawings:
 - a. Schedule of caulking and sealants installation, indication each specific surface where caulking or sealants are to be provided and the material proposed for each application.
2. Product Data:
 - a. Copies of manufacturer's data sheets including color charts, specifications, recommendations, and installation instructions for each type of sealant, caulking compound, and associated miscellaneous material required. Include manufacturer's published data, indicating that each product complies with the Contract

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

Documents and is intended for the applications shown or indicated.

- b. Product test reports and UL Listed design data sheets

B. Informational Submittals: Submit the following:

1. Certificates:

- a. Certify that materials are suitable for intended use and materials meet or exceed requirements of the Contract Documents.
- b. Certification from manufacturer that products furnished are appropriate for surfaces and conditions to which they will be applied.
- c. Certify that applicator is approved by manufacturer.

2. Field Quality Control Submittals:

- a. Results of tests on job mock-ups.
- b. Pre-construction and post-construction field test reports.
- c. Compatibility and adhesion test reports.
- d. Contractor's Field Test Report Logs:
 - 1) Indicate time present at the Site.
 - 2) Include observations and results of field tests, and document compliance with manufacturer's installation instructions and supplemental instructions provided to installers.

3. Pre-installation conference record.

4. Qualifications: Submit qualifications for:

- a. Installer.
- b. Testing laboratory

C. Closeout Submittals: Submit the following:

1. Operation and Maintenance Data:

- a. Recommended inspection intervals.
- b. Instructions for repairing and replacing failed sealant joints.

2. Warranty: Submit written warranties as specified in this Section.

1.5 DELIVERY, STORAGE AND HANDLING

A. Comply with the following:

1. Delivery of Products:

- a. Deliver products in caulking and sealant manufacturer's original unopened, undamaged containers, indicating compliance with approved Shop Drawings and approved Sample color selections.
- b. Include the following information on label:
 - 1) Name of material and Supplier.
 - 2) Formula or Specification Section number, lot number, color and date of manufacture.
 - 3) Mixing instructions, shelf life, and curing time, when applicable.

2. Storage of Products:

- a. Do not store or expose materials to temperature above 90 degrees F or store in direct sunlight.
- b. Do not use materials that are outdated as indicated by shelf life.
- c. Store sealant tape in manner that will not deform tape.
- d. In cool or cold weather, store containers for sixteen hours before using in temperature of approximately 75 degrees F.
- e. When high temperatures prevail, store mixed sealants in a cool place.

3. Handling:

- a. Do not open containers or mix components until necessary preparatory Work and priming are complete.

1.6 JOB CONDITIONS

A. Conform to applicable OSHA and the New York State Building Codes.

B. Environmental Conditions:

1. Do not install caulking and sealants under adverse weather conditions, or

when temperatures are below or above manufacturer's recommended limitations for installation.

2. Proceed with the Work when forecasted weather conditions are favorable for proper cure and development of high-early bond strength.
3. Where joint width is affected by ambient temperature variations, install elastomeric sealants when temperatures are in the lower third of manufacturer's recommended installation temperature range, so that sealant will not be subjected to excessive elongation and bond stress at subsequent low temperatures.
4. When high temperatures prevail, avoid mixing sealants in direct sunlight.
5. Supplemental heat sources required to maintain both ambient and surface temperatures within the range recommended by manufacturer for material applications are not available at the Site.
6. Provide supplemental heat and energy sources, power, equipment, and operating, maintenance, and temperature monitoring personnel.
7. Do not use heat sources that emit carbon dioxide or carbon monoxide into areas of caulking, sealants, and painting Work, and areas where Owner's personnel or construction personnel may work. Properly locate and vent such heat sources to outdoors so that caulking and sealants and other Work are unaffected by exhaust.

1.7 WARRANTY

- A. Provide written warranty, signed by manufacturer and Contractor, agreeing to repair or replace sealants that fail to perform as air-tight and watertight joints; or fail in joint adhesion, cohesion, abrasion resistance, weather resistance, extrusion resistance, migration resistance, stain resistance, or general durability; or appear to deteriorate in any other manner not clearly specified in approved Shop Drawings and other submittals, as an inherent quality of material for exposure indicated.
 1. Provide manufacturer warranty for period of one year from date of Substantial Completion of caulking and sealants Work.
 2. Provide installer warranty for period of two years from date of Substantial Completion of caulking and sealants Work.

PART 2 - PRODUCTS

2.1 SYSTEM PERFORMANCE

- A. Provide elastomeric joint sealants for interior and exterior joint applications that

establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

- B. VOC Performance Criteria:
1. VOC content of sealants used shall comply with current VOC content limits of SCAQMD Rule 1168. Sealants used as fillers shall comply with or exceed requirements of BAAQMD Regulation 8, Rule 51.
 - a. Sealants: 250 g/L.
 - b. Sealant Primers for Nonporous Substrates: 250 g/L.
 - c. Sealant Primers for Porous Substrates: 775 g/L.
 - C. Provide colors selected by Engineer from caulking and sealant manufacturer's standard and custom color charts. "Or equal" manufacturers shall provide same generic products and colors as available from manufacturers specified.

2.2 MATERIALS

- A. Exterior and Interior Vertical Joints; Non-submerged:
1. Two-component Polyurethane Sealant:
 - a. Products and Manufacturers: Provide one of the following:
 - 1) Sikaflex- 2c NS by Sika Corporation.
 - 2) Dymeric 240 FC by Tremco Sealant/Waterproofing Division of RPM International, Inc.
 - 3) Or equal.
 - b. Polyurethane based, two-component elastomeric sealant complying with:
 - 1) FS TT-S-00227E: Type II (non-sag) Class A and ASTM C920, Type M, Grade NS, Class 25.
 - 2) Adhesion-in-Peel, FS TT-S-00227E and ASTM C794: (Minimum five pounds per linear inch with no adhesion failure): 10 pounds.
 - 3) Hardness (Standard Conditions), ASTM C661: 25 to 35 (Shore A).
 - 4) Stain and color change, FS TT-S-00227E and ASTM C510:

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

No discoloration or stain.

- 5) Accelerated Aging, ASTM C793: No change in sealant characteristics after 250 hours in weatherometer.
- 6) Rheological Vertical Displacement at 120 degrees F, FS TT-S-00227E: No sag.
- 7) VOC Content: 100 g/L, maximum.

B. Exterior and Interior Horizontal Joints; Non-submerged:

1. Two-component Polyurethane Sealant:

a. Products and Manufacturers: Provide one of the following:

- 1) Sikaflex- 2c SL by Sika Corporation.
- 2) THC/900 by Tremco Sealant/Waterproofing Division of RPM International, Inc.
- 3) Or equal.

b. Polyurethane based, two-component elastomeric, self-leveling sealant complying with the following:

- 1) FS TT-S-00227E, Type I (self-leveling) Class A. and ASTM C920, Type M, Grade P, Class 25
- 2) Water Immersion Bond, FS TT-S-00227E: Elongation of 50 percent with no adhesive failure.
- 3) Hardness (Standard Conditions), ASTM C661: 35 to 45.
- 4) Stain and Color Change, FS TT-S-00227E and ASTM C510: No discoloration or stain.
- 5) Accelerated Aging, ASTM C793: No change in sealant characteristics after 250 hours in weather meter.
- 6) VOC Content: 165 g/L, maximum.

C. Miscellaneous Materials:

1. Joint Cleaner: As recommended by caulking and sealant manufacturer.
2. Joint Primer and Sealer: As recommended for compatibility with caulking and sealant by caulking and sealant manufacturer.

3. Bond Breaker Type: Polyethylene tape or other plastic tape as recommended for compatibility with caulking and sealant by caulking and sealant manufacturer, to be applied to sealant-contact surfaces where bond to substrate or joint filler must be avoided for proper performance of caulking and sealant. Provide self-adhesive tape where applicable.
4. Sealant Backer Rod: Compressible rod stock polyethylene foam, polyethylene jacketed polyurethane foam, butyl rubber foam, neoprene foam or other flexible, permanent, durable non-absorptive material as recommended for compatibility with caulking and sealant by caulking and sealant manufacturer. Provide size and shape of rod that will control joint depth for sealant placement, break bond of sealant at bottom of joint, form optimum shape of sealant bead on back side, and provide highly-compressible backer to minimize possibility of sealant extrusion when joint is compressed.
5. Low-temperature Catalyst: As recommended by caulking and sealant manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine joint surfaces, substrates, backing, and anchorage of units forming sealant rabbet, and conditions under which caulking, and sealant Work will be performed, and notify Engineer in writing of conditions detrimental to proper and timely completion of the Work and performance of sealants. Do not proceed with caulking and sealant Work until unsatisfactory conditions are corrected.
- B. Laboratory Pre-construction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers for testing indicated below samples of materials that will contact or affect joint sealants.
 1. Use ASTM C1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 2. Submit at least eight pieces of each type of material, including joint substrates, shims, joint sealant backings, secondary seals, and miscellaneous materials.
 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 4. For products that fail tests, obtain joint-sealant manufacturer's written instructions for corrective measures including using specially formulated primers.

5. Immersion Testing: ASTM C1247 for potable water and wastewater.
6. Testing will not be required if joint sealant manufacturers submit joint preparation data based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted and mock-up field testing is acceptable.

3.2 PREPARATION

- A. Protection: Do not allow caulking and sealants to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces including rough textured materials. Use masking tape or other precautionary devices to prevent staining of adjoining surfaces, by either the primer/sealer or caulking and sealant materials.
- B. Joint Surface Preparation:
 1. Clean joint surfaces immediately before installing sealant compound. Remove dirt, weakly adhering coatings, moisture and other substances that would interfere with bonds of sealant compound as recommended in sealant manufacturer's written instructions as shown on approved Shop Drawings.
 2. If necessary, clean porous materials by grinding, sandblasting, or mechanical abrading. Blow out joints with oil-free compressed air or by vacuuming joints prior to applying primer or sealant.
 3. Roughen joint surfaces on vitreous coated and similar non-porous materials, when sealant manufacturer's data indicates lower bond strength than for porous surfaces. Rub with fine abrasive cloth or steel wool to produce a dull sheen.
- C. Mixing:
 1. Comply with sealant manufacturer's written instructions for mixing multi-component sealants.
 2. Thoroughly mix components before use.
 3. Add entire contents of activator can to base container. Do not mix partial units.
 4. Mix contents for minimum of five minutes or as recommended by sealant manufacturer, until color and consistency are uniform.

3.3 INSTALLATION

- A. Install caulking and sealants after adjacent areas have been cleaned and before joint has been cleaned and primed, to ensure caulking and sealant joints will not be soiled. Replace caulking and sealant joints soiled after installation.

CONTRACT NO. 22-522
DIVISION 7 – THERMAL AND MOISTURE PROTECTION

- B. Comply with sealant manufacturer's written instructions except where more stringent requirements are shown or indicated in the Contract Documents, and except where manufacturer's technical representative directs otherwise, only as acceptable to Engineer.
- C. Prime or seal joint surfaces as shown on approved Shop Drawings and approved other submittals. Do not allow primer or sealer to spill or migrate onto adjoining surfaces. Allow primer to dry prior to applying sealants.
- D. Apply masking tape before installing primer, in continuous strips in alignment with joint edge to produce sharp, clean interface with adjoining materials. Remove tape immediately after joints have been sealed and tooled as directed.
- E. Do not install sealants without backer rods and bond breaker tape.
- F. Roll back-up rod stock into joint to avoid lengthwise stretching. Do not twist, braid, puncture, or prime backer rods.
- G. Employ only proven installation techniques that will ensure that sealants are deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a slight cove, so that joint will not trap moisture and dirt.
- H. Install sealants to depths recommended by sealant manufacturer but within the following general limitations, measured at the center (thin) section of bead.
 - 1. For horizontal joints in sidewalks, pavements, and similar locations sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to depth equal to 75 percent of joint width, but not more than 5/8-inch deep or less than 3/8-inch deep.
 - 2. For vertical joints subjected to normal movement and sealed with elastomeric sealants and not subject to traffic, fill joints to a depth equal to 50 percent of joint width, but not more than 1/2-inch deep or less than 1/4-inch deep.
- I. Remove excess and spillage of compounds promptly as the Work progresses.
- J. Cure caulking and sealant compounds in compliance with manufacturer's instructions and recommendations, to obtain high-early bond strength, internal cohesive strength, and surface durability.

3.4 EXISTING JOINTS

- A. Mechanically remove existing sealant and backer rod.

- B. Clean joint surfaces of residual sealant and other contaminants capable of affecting sealant bond to joint surface.
- C. Conduct laboratory pre-construction compatibility and adhesion testing on joint surfaces in accordance with Paragraph 3.1.B of this Section.
- D. Allow joint surfaces to dry before installing new sealants.

3.5 FIELD QUALITY CONTROL

- A. Post-construction Field Adhesion Testing: Before installing elastomeric sealants, field-test joint sealant adhesion to joint substrates as follows:
 - 1. Extent of Testing: Test completed elastomeric sealant joints as follows:
 - a. Perform ten tests for the first 1,000 feet of joint length for each type of elastomeric sealant and joint substrate.
 - b. Perform one test for each 1,000 feet of joint length thereafter, and minimum of one test per each floor per elevation.
 - c. Test Method: Test joint sealants according to Method A, Field-applied Sealant Joint Hand Pull Tab, and Method D, Water Immersion in Appendix X1 of ASTM C1193. For joints with dissimilar substrates, verify adhesion to each substrate separately by extending cut along one side and verifying adhesion to opposite side. Repeat procedure for opposite side.
 - d. Inspect joints for complete fill, absence of voids, and joint configuration complying with specified requirements. Record results in a log of field adhesion tests.
 - e. Inspect tested joints and report on whether:
 - 1) Sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
 - 2) Sealants filled the joint cavities and are free of voids.
 - 3) Sealant dimensions and configurations comply with specified requirements.
 - f. Record test results in a log of field adhesion tests. Include dates when sealants were installed, names of persons who installed

sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.

- g. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
- h. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other requirements will be satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.
- i. Do not proceed with installation of elastomeric sealants over joint surfaces that have been painted, lacquered, waterproofed, or treated with water repellent or other treatment or coating unless a laboratory test for durability (adhesion), in compliance with FS TT-S-00227, has successfully demonstrated that sealant bond is not impaired by the coating or treatment. If laboratory test has not been performed or shows bond interference, remove coating or treatment from joint surfaces before installing sealant.

B. Water Leak Testing: Field test for water leaks as follows:

- 1. Flood the joint exposure with water directed from a 3/4-inch diameter garden hose, without nozzle, held perpendicular to wall face, two feet from joint and connected to water system with 30 psi minimum normal water pressure. Move stream of water along joint at an approximate rate of 20 feet per minute.
- 2. Test approximately five percent of total joint system, in locations that are typical of every joint condition, and that can be inspected easily for leakage on opposite face. Conduct test in presence of Engineer, who will determine actual percentage of joints to be tested and actual period of exposure to water from hose, based on extent of observed leakage or lack of observed leakage.
- 3. Where nature of observed leaks indicates potential of inadequate joint bond strength, Engineer may direct that additional testing be performed at a time when joints are fully cured, and before Substantial Completion.

3.6 ADJUSTING AND CLEANING

- A. Where leaks and lack of adhesion are evident, replace sealant.

- B. Clean adjacent surfaces of sealant and soiling resulting from the Work. Use solvent or cleaning agent recommended by sealant manufacturer. Leave all finish Work in neat, clean condition.
- C. Protect sealants during construction so that they will be without deterioration, soiling, or damage at time of readiness for final payment of the Contract.

3.7 PROTECTION

- A. During and after curing period, protect joint sealants from contact with contaminating substances and from damage resulting from construction operations or other causes, so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original Work.

+ + END OF SECTION + +

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Provide hollow metal doors and frames as indicated on Drawings and specified herein.

1.2 RELATED SECTIONS

- A. The following Sections contain requirements that relate to this Section:
 - 1. Section 08 71 00, Door Hardware
 - 2. Section 08 90 00, Louvers and Vents.

1.3 REFERENCES

- A. References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.
 - 1. Underwriters' Laboratories, Inc. (UL)
 - 2. American Society for Testing and Materials (ASTM)
 - 3. National Fire Protection Association (NFPA)
 - 4. Steel Door Institute (SDI)
 - 5. Hollow Metal Manufacturers Association (HMMA)

1.4 SUBMITTALS

- A. Product Data
Manufacturer's catalog sheets, specifications, and installation instructions.
- B. Shop Drawings:
 - 1. Show details of each frame type, elevation and construction for each door type, conditions at openings, location for each door type, location and installation requirements for finish hardware (including cutouts and

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

reinforcements), details of connections, and anchorage and accessory items.

2. Include a schedule of doors and frames using the same reference numbers for details and openings as those on the Contract Drawings.
3. For sound rated assemblies, provide drawings indicating interface of sound rated doors and frames with adjacent construction. Include details of each frame type, cam hinge (when used), sound seals, door bottom, threshold, and door. Indicate location and installation requirements of door and frame hardware and reinforcements. Indicate glazing materials and details for glazed assemblies.

C. Samples

1. Frames: Corner sample of each type, 18" x 18" with mortises and reinforcements, shop primed.
2. Doors: Corner sample of each type showing construction, 18" x 18", with mortises and reinforcements, shop primed.
3. Security Louver panel, as per Section 08 91 19.

D. Quality Control Submittals

1. Include approval data and acceptance by a New York City Building Department approved testing agency for all fire-rated assemblies.
2. Provide certification glazing meets safety impact requirements of CPSC 16 CFR 1201.
3. Provide certification for oversized assemblies as described in Quality Assurance.

E. Warranties

1. Provide manufacturer/installer warranty.

1.5 QUALITY ASSURANCE

- A. Provide doors and frames complying with ANSI/SDI A250.8 and as herein specified.
- B. Fire Rated Assemblies

Wherever fire resistance classification is shown or scheduled for hollow metal doors and frames, provide fire rated units that have been tested as fire door assemblies and comply with National Fire Protection Association (NFPA) Standard No. 80, are tested in accordance with NFPA 252 or UL 10B/UL 10C and

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

UL 1784 as required by the NYS Building Code and comply with these Specifications. Identify each door and frame with metal UL, or Warnock Hersey labels indicating applicable fire class of the unit. Rivet or weld labels on the hinge edge of door and jamb rabbet of frame.

1. Oversize Assemblies: Whenever fire rated assemblies are larger than size limitations established by NFPA, provide manufacturer's certification that they have been constructed with materials and methods equivalent to requirements for labeled construction.
2. See Door Schedule in the Drawings for Label Requirements (Class) for respective openings.

C. Regulatory Requirements

1. Notwithstanding the requirements for fire-rated assemblies noted above, all fire-rated doors and frames shall be approved for use in New York State
2. Provide evidence of acceptance by an approved testing agency. Provide permanent labels on doors and frames as required by the New York State Building Code. Labels shall be applied at the factory or where fabrication and assembly are performed.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store doors and frames on raised platforms in vertical position with blocking between units to allow air circulation.
- B. During delivery, storage and handling, protect doors and frames from water damage.
- C. Provide delivery, storage and handling in such manner to prevent damage to products.

1.7 FIELD EXAMINATION

- A. At the Site, before door installation, the Owner reserves the right to select at random one or more doors for examination by cutting a portion of such size to reveal the construction of the particular door.
 1. If the examination finds that the doors examined do not comply with requirements of the Specifications, all doors shall be removed from the Site and new doors shall be provided. Costs of examination and replacement of rejected doors shall be borne by Contractor.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

2. If the examination finds that the doors do comply with the requirements of the Specifications, the cost of the examination and the cost of the replacement of the examined doors will be borne by the Owner.

1.8 GAUGE STANDARDS

- A. Gages specified are based on U.S Standard Gauge for hot rolled and cold rolled steel sheets.
- B. The allowable tolerances for steel sheet thicknesses shall be in accordance with HMMA Standards.

1.9 WARRANTY

- A. Submit warranty signed by manufacturer and installer, agreeing to replace assemblies which fail in materials, performance or workmanship within the specified warranty period.
 1. Warranty Period: 1 year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acme & Dorf Door Corp., Clifton NJ 07011
- B. Ceco Door Products Div., Milan, TN 38358
- C. Curries Company, Mason City, IA 50401
- D. Long Island Fireproof Door, Port Washington, NY 11050
- E. Michbi Doors Inc. Brentwood, NY 11717
- F. Or Approved Equal.

2.2 MATERIALS

- A. Cold-Rolled Steel Sheets
Commercial Quality carbon steel complying with ASTM A1008 and ASTM A568.
- B. Metallic-Coated Steel Sheet
Commercial Quality Steel complying with ASTM A653, Type B with minimum G60 (Z180) or A60 metallic coating.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

C. Galvannealed Steel Sheets

Carbon steel sheets of commercial quality complying with ASTM A653 Doors and frames shall have A60 zinc-iron coating, mill phosphatized, complying with ASTM A653.

D. Anchors and Supports

Fabricate of gages indicated on and of not less than 16 gage sheet steel, unless otherwise indicated, on the drawings

1. Galvanized Units: Galvanized anchors and supports used with galvanized frames, complying with ASTM A153, Class B.

E. Anchorage Devices, Bolts, and other Fasteners

Manufacturer's standard units unless otherwise indicated on the Drawings.

1. Galvanized Units: Galvanized items used with galvanized frames complying with ASTM A153, Class C or D as applicable.

2.3 FABRICATION

A. Fabricate hollow metal work accurately and assemble neatly to ensure work smooth and free from dents, tool marks, visible waves, warp, buckles and conspicuous joints.

B. Align lines straight and true with arises and angles as sharp as practicable. Miter corners in true alignment and join similar abutting profiles accurately.

C. Assemble all joints to form imperceptible intersections when finished.

D. Form each member, such as jamb and head, from a single piece of metal, unless otherwise shown or approved.

E. Fasten all members together to provide rigid construction in assembled work. Weld all connections except those for removable members such as glazing beads.

F. Weld, dress smooth and flush joints on exposed faces.

G. Clearances

Fabricate doors for their respective frames within the following clearances:

1. Jambs and Head: 3/32" to 1/8".
2. Meeting Edges of Pairs: 1/8" to 3/16".
3. Bottom (no threshold or carpet): 3/8", maximum.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

4. Bottom (at threshold or carpet): 1/4", maximum.

H. Work showing defects or blemishes will be rejected and rejected work shall be replaced with satisfactory work.

2.4 DOORS

A. General

1. Provide steel doors of types and styles indicated on drawings or schedules. Comply with ANSI/SDI A250.8 requirements unless more restrictive requirements are specified herein.
2. Design and Thickness: Flush design doors, seamless vertical edges, hollow construction, 1 3/4" thick unless specifically noted otherwise.
3. Sound Deadening (ASTM E90): Minimum Sound Transmission Class (STC) of 30.
4. Door Edges: Bevel lock stile edge of single acting hinged doors 1/8" in 2". Double acting doors shall have rounded edges, approximately 2 1/4" radius. Meeting stiles of pairs of single acting doors shall be "V" beveled or rounded as detailed on the Drawings or required.
5. Glazing Stops and Beads: Fixed steel stops, formed integral with door unless otherwise approved by the Owner, on the outside of exterior doors and on the secure side of interior doors. Removable steel beads, of tubular steel of gage indicated on the Drawings or solid bar stock, on the other side of doors secured with machine screws. Form corners with butted hairline joints. Coordinate width of rabbet between fixed stop and removable bead and depth of rabbet with type of glass and glazing required.
6. Glazing:
 - a. Non-rated doors - 1/4" thick minimum laminated glass meeting safety impact requirements of CPSC 16 CFR 1201.
 - b. Fire-rated doors – Fire Protection rated glazing meeting safety impact requirements of CPSC 16 CFR 1201.
 - c. Fire-protection-rated glazing in excess of 100 square inches shall be permitted in fire door assemblies when tested as components of the door assemblies and not as glass lights per NYS Building code.

Size and location of vision panels shall be as indicated on the drawings.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

B. Interior Doors

1. Fabricate interior doors with 2 outer stretcher-leveled, steel sheets of 12 gage unless indicated otherwise on the Drawings. Construct doors with smooth, flush surfaces without visible joints or seams on exposed faces and stile edges, except around glass and louver panels. On mortise face of door, vertical joints shall be welded, filled and ground smooth.
2. Provide surface sheet reinforcement for surface sheet, edge, hardware, stops and other provisions, of size and gage as detailed on Drawings.
3. Provide 14 GA top and bottom channels and closures as detailed on the Drawings.
4. For all toilet room, locker room, mechanical room, food service area doors and other doors indicated on the door schedule, all outer sheets of the door shall be galvanized and welds shall be coated with zinc rich primer.

C. Louvered Panels for Doors

1. Provide steel louvers for doors where indicated on Drawings and as specified herein. Refer to Section 08 90 00.

2.5 FRAMES

A. General

1. Provide steel frames for doors, and other openings where shown, of size and profile as indicated on Drawings.
2. Construction: Full-welded unit construction, with corners mitered and continuously welded full depth and width of frame, unless otherwise indicated. Knock-down type frames will not be accepted.
 - a. Fixed Stops: Integral 5/8" stop unless otherwise indicated. Construct jambs and heads from one piece of metal each; rabbeted and flanged as required for the various types of openings, and neatly mitered or interlocked and welded together. Provide channel, angle and bent plate reinforcing as indicated on approved Shop Drawings or otherwise required. Provide reinforcing in the heads of frames where shown or required.
3. Frame Material
 - a. Interior Frames: 12 gage Galvanized steel sheet unless indicated otherwise on Drawings.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

4. Provide frames for masonry openings with adjustable Underwriter's type masonry anchors to suit conditions of installation, using not less than three (3) at each jamb, in addition to floor anchors.
5. Provide frames with calking stops, filler pieces and trim where indicated on Drawings or required; integrally formed as part of the frame wherever possible. Applied calking stops, filler pieces, and other members as indicated, shall be neatly attached by spot welding. All welds at galvanized frames shall be painted with zinc-rich primer.
6. Equip sound-proof frames with adjustable door stops and continuous rubber seals. Fill frames solidly with sound-deadening material.
7. At butts, cut back jamb the thickness of one leaf of butt.
8. Drill and tap reinforcement to template.
9. Spot weld 20 gage plaster guard to frame at latch cutouts, if applicable. Paint all welded areas with zinc-rich primer.
10. Provide reinforcement for hardware as indicated on Drawings and as required for proper hardware installation. Refer to Section 08 71 00 - Door Hardware.
11. Provide frames for other openings as indicated on the Drawings.
12. Provide cutouts and reinforcing for security devices as required.

2.6 SHOP PAINTING

- A. All doors shall be delivered to the site with a full shop coat. Doors not fully shop coated shall not be accepted.
- B. Chemically wash, rinse, and dry exposed and concealed surfaces of fabricated units.
- C. Apply one coat of rust-inhibiting primer (Carboline "Carbozinc 11 HS" or approved equal) to all exposed surfaces of ungalvanized doors and frames. Use the same paint to touch up all welded areas of galvanized doors and frames. Apply primer per the manufacturer's recommendations
- D. Units shall pass the following tests:
 1. Salt Spray Test complying with ASTM B117 for 120 continuous hours.
 2. Water fog Test Complying with ASTM D1735 or ASTM D4585 for 240 continuous hours

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions

Examine substrate and conditions, under which the frames are to be installed, for defects which will adversely affect the execution and quality of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Install hollow metal doors, frames, and accessories in accordance with the Drawing Details, approved Shop Drawings, and the manufacturer's printed instructions, except as otherwise indicated.

B. Frame Installations

Place frames accurately in position; plumb, align, and brace securely until permanent anchors are set. After wall construction is complete, remove temporary braces and spreader bars, leaving surfaces smooth and undamaged.

1. At in-place concrete and in-place masonry construction, place frames and secure in place with anchorage devices. Set anchorage devices opposite each anchor location, in accordance with details on approved Shop Drawings and anchorage device manufacturer's instructions. Leave drilled holes rough, not reamed, and free from dust and debris.

a. Anchor frames as detailed on the Drawings.

2. Place fire rated frames in accordance with NFPA Standard No. 80.

3. Provide necessary field splices in frames as detailed on approved Shop Drawings, welded and finished to match factory fabrication.

4. Extend jambs to structural floor slab and securely anchor in place.

C. Door Installation

1. Install doors accurately in their respective frames within the clearance specified in Part 2.

2. Place fire rated doors with clearances as specified in NFPA standard No. 80.

D. Drill and tap doors and frames to receive surface applied hardware.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

3.3 ADJUSTING

A. Prime Coat Touch-up

Immediately after installation, sand smooth and clean rusted and damaged areas of shop prime coat and apply touch-up of original primer.

B. Final Adjustments

Check and adjust operating finish hardware items prior to final inspection. Leave work in complete and proper operating condition.

3.4 CLEANING

A. Clean doors, frames, and accessories, leaving free of dirt and other foreign material after completion of installation.

++ END OF SECTION ++

SECTION 08 36 80

OVERHEAD ROLLING DOORS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall provide all labor, materials, equipment and incidentals as shown, specified, and required to furnish and install overhead rolling doors.
2. The extent of overhead rolling doors is shown on the Contract Drawings and in schedules.
3. The types of rolling door Work required includes the following:
 - a. Insulated aluminum overhead rolling door. (unless otherwise indicated on drawings)

B. Coordination:

1. Review installation procedures under other Sections and coordinate the installation of items that must be installed with the overhead rolling doors.
2. Inserts and Anchorages: Furnish inserts and anchoring devices which must be set in concrete or built into masonry for the installation of the units. Provide setting drawings, templates, instructions and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.

C. Related Sections:

1. Division 26, Electrical.

1.2 QUALITY ASSURANCE

- A. Wind Loading Design Criteria: Design and reinforce rolling doors to withstand a wind loading pressure of 30 pounds per square feet.
- B. Source Quality Control: Provide overhead rolling doors as complete units produced by a single manufacturer specializing in the production of this type of work, including hardware, accessories, mounting and installation components.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

- C. Reference Standards: Comply with applicable provisions and recommendations of the following, except where otherwise shown or specified.
1. Aluminum Association (AA) Standards and Finish Designations.
 2. ASTM A446, Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
 3. ASTM A525, General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
 4. National Electrical Manufacturers Association (NEMA), Standard KS 1.

1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval the following:
1. Drawings for components and installations as shown or specified.
 2. Copies of manufacturer's specifications, roughing-in diagrams, and installation instructions for each type and size of rolling door. Include manufacturer's data, operating instructions and maintenance data. Indicate by transmittal form that installer has received a copy of diagrams and installation instructions.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials:
1. Deliver doors and frames cartoned or crated to provide protection during transit and job storage.
 2. Inspect metal work upon delivery for damage. Minor damage may be repaired provided the finish items are equal in all respects to new work and acceptable to the Engineer, otherwise, remove and replace damaged items as directed.
- B. Storage of Materials: Store doors and frames at the building site under cover. Place units up off the floors in a manner that will prevent rust and damage. Avoid the use of non-vented plastic or canvas shelters which could create a humidity chamber.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Door Curtain:
1. Door Curtain Slats: Fabricate rolling door curtain of flat interlocking slats designed to withstand the specified wind loading, of continuous length for the

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

width of the door without splices. Unless otherwise shown or specified, provide slats of the material gauge recommended by the door manufacturer for the size and type of door required, as follows:

- a. Aluminum Door Curtain Slats: Provide the following minimum gage materials for all door types: 16 gage Brown and Sharpe. Double faced slats insulated with closed cell polyethylene foam. Provide the following equivalent anodic finish and color after AA Number M34C22 combined pretreatment (caustic etch with satin finish).
 - 1) AA Number A42 with medium bronze.
 2. Endlocks: Heavy malleable iron castings, secured to curtain slats with 2 galvanized rivets. Provide locks on alternate curtain slats for curtain alignment and resistance against lateral movement.
 3. Windlocks: Heavy malleable iron castings secured to curtain slats with 3 galvanized rivets. Space windlocks approximately 24 inches on center on both edges of curtain.
 4. Bottom Bar: Consisting of 2 aluminum angles, each not less than 1-1/2 inches by 1-1/2 inches by 1/8 inch thick.
- B. Curtain Jamb Guides:
1. Fabricate curtain jamb guides of Type 316 stainless steel shapes with sufficient depth and strength to retain the curtain against specified wind loading. Build-up units with minimum 3/16-inch thick steel sections complying with ASTM A36. Slot bolt holes for track adjustment.
 2. Secure guides to continuous wall angles. Place anchor bolts on exterior wall guides so that they are concealed when door is in closed position. Provide removable stops on guides to prevent over-travel of curtain, and a continuous bar for holding windlocks.
- C. Weather Seals, Exterior Doors: Provide natural rubber or neoprene rubber weatherstripping for exterior doors. Secure weather seals with continuous metal pressure bars. At door heads, use a 1/8-inch thick continuous sheet secured to the inside of the curtain coil hood. At door jambs, use a 1/8-inch thick continuous strip secured to the exterior side of the jamb guide.
- D. Counterbalancing Mechanism:
1. Counterbalance doors by means of an adjustable steel helical torsion spring mounted around a steel shaft and mounted in a spring barrel and connected to

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

the door curtain with the required barrel rings. Use grease-sealed ball bearings or self-lubricating graphite bearings for all rotating members.

2. Counterbalance Barrel:
 - a. Fabricate spring barrel of hot-formed structural quality carbon steel, welded or seamless pipe, of sufficient diameter and wall thickness to support the roll-up of curtain without distortion of slats and limit barrel deflection to not more than 0.03 inch per foot of span under full load.
 - b. Provide spring balance of one or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance the weight of the curtain, with uniform adjustment accessible from outside barrel. Provide cast steel barrel plugs to secure ends of springs to the barrel and the shaft.
 - c. Fabricate torsion rod for counterbalance shaft of case-hardened steel, of required size to hold the fixed spring ends and carry the torsional load.
 3. Brackets: Provide mounting brackets of manufacturer's standard design, either cast iron or cold-rolled steel plate with bell-mouth guide groove for curtain.
 4. Hood:
 - a. Form to entirely enclose coiled curtain and operating mechanism at opening head, and act as a weather seal. Contour to suit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Provide closed ends for surface-mounted hoods, and any portion of jamb mounting projecting beyond wall face. Provide intermediate support brackets as required to prevent sag.
 - b. Fabricate hoods of Alloy 3003 aluminum sheet not less than 0.032-inches thick, mill finish.
- E. Product and Manufacturer: Provide one of the following:
1. Overhead Door Model 422 Sectional Steel Door, Model 630,631 Fire rated doors
 2. Thermal Series as manufactured by Atlas Door Corporation.
 3. Thermiser as manufactured by Cornell Iron Works Incorporated.
 4. Or approved equal.

2.2 ACCESSORIES

A. Electric Door Operators:

1. General: Furnish electric door operator assembly of the size and capacity recommended and provided by the door manufacturer; complete with electric motor and factory-prewired motor controls, gear reduction unit, solenoid operated brake, clutch, remote control stations, and control devices meeting NEMA 1 requirements.
2. Provide a hand-operated disconnect or a mechanism for automatically engaging a sprocket and chain operator and releasing brake for emergency manual operation. Mount disconnect and operator so that they are accessible from floor level. Include an interlock device to automatically prevent the motor from operating when emergency operator is engaged.
3. Design operator so that motor may be removed without disturbing the limit-switch adjustment and without affecting the emergency auxiliary operator.
4. Door Operator Type: Provide wall or bracket-mounted door operator units consisting of an electric motor, a worm gear drive from motor to reduction gear box, a chain or worm gear drive from reduction box to a gear wheel mounted on the counterbalance shaft, and a quick-clutch disconnect-release for manual operation. Provide motor, clutch, and drive assembly of horsepower and design as determined by the door manufacturer for the size of door required and as herein specified.
5. Electric Motors:
 - a. Provide high-starting torque, reversible, constant duty, Class A insulated electric motors with overload protection.
 - b. Provide UL Listed electric operator, size and type as recommended by the manufacturer (1 horsepower motor min.) to move door in either direction, from any position, at not less than 8 inches nor more than 12 inches per second. Operator shall meet UL325/2010 requirements for continuous monitoring of safety devices.
 - c. Coordinate wiring requirements and current characteristics of motors with the building electrical system; see Division 26 of these Specifications.
 - d. Provide open-drip-proof type, unless otherwise shown or specified.
 - e. Motors shall be 3 phase, rated for 460-volt operation.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

6. Remote Control Station:
 - a. Unless otherwise shown, provide momentary-contact, 3-button NEMA 1 control station with push button controls labeled "open," "close" and "stop." Install at location as shown or scheduled.
7. Safety Edge Device: Provide each door with an electric safety switch, extending full width of the door bottom, and located within a U-shaped neoprene or rubber astragal mounted to the bottom door rail. Design the unit to operate such that contact with the switch before fully closing will immediately stop the downward travel and reverse the direction to the fully opened position. Connect to the control circuit through a retracting safety cord. The compressible strip shall also serve as a weatherseal along the bottom of the door.

2.3 SURFACE PREPARATION AND SHOP PAINTING

- A. Clean and prime coat ferrous metal surface of equipment in the shop in accordance with the requirements of Section 09 91 13.
- B. Coat bearing, gear and similar mechanical, polished and non-ferrous metal surfaces with corrosion prevention compound which shall be maintained during storage and until equipment begins operation.
- C. Field painting is under Section 09 91 13.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Contractor and his installer must examine the substrates and conditions under which the rolling door unit is to be installed and notify Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to Engineer.

3.2 INSTALLATION

- A. Install, connect and adjust doors in full accordance with the manufacturer's written instructions, the approved Shop Drawings, and as shown and specified. Refer to paragraph 1.1.B of this Section for the requirements of coordination with others.
- B. Install, wire, connect and adjust doors, motors, starters, pushbutton stations, limit and safety switches and all other electrical accessories and connections required in full accordance with the manufacturer's written instructions, the approved Shop Drawings,

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

and as shown and specified. Refer to paragraph 1.1.B of this Section for the requirements of coordination with others.

3.3 FIELD QUALITY CONTROL

- A. Upon completion of installation including the work by other trades, test and adjust doors to operate easily, free from warp, twist or distortion. Test the door in presence of Engineer to demonstrate compliance with the Specifications and the manufacturers design criteria.

3.4 ADJUSTMENT AND CLEANING

- A. Adjust mechanism so moving parts operate smoothly.
- B. Repair damage to rolling doors, and match manufacturer's original finish.
- C. Leave work area clean and free of debris.

++ END OF SECTION ++

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SECTION 08 71 00

FINISH HARDWARE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall furnish all labor, material, equipment and incidentals required to provide finish hardware as shown and specified.
2. The extent of finish hardware is shown on the Drawings and in schedules. Finish hardware is defined to include all items known commercially as finish hardware, as required for swing doors, except special types of unique and unmatching hardware specified in the same Section as the door and door frame.
3. The types of finish hardware required include the following and as indicated in the Hardware Schedule on the drawings:
 - a. Mortise hinges.
 - b. Locksets.
 - c. Latchsets.
 - d. Door closers.
 - e. Stripping and seals.
 - f. Thresholds.
 - g. Miscellaneous items.

B. Coordination: Review installation procedures under other Sections and coordinate the installation of items that must be installed with the finish hardware.

C. The contractor shall coordinate the installation of security door hardware specified in these specifications and in the construction drawings, including but not limited to, electric door strikes, locksets, magnetic locks, interchangeable lock cores, and any other related door security hardware, with the District's security system vendor, prior to ordering the hardware, to ensure the final installation is fully coordinated and integrated with the security system vendor's work.

D. Related Work Specified Elsewhere:

1. Section 08 11 13, Metal Doors and Frames.

1.2 QUALITY ASSURANCE

- A. Supplier Qualifications: The finish hardware supplier shall have in their employ a member of the American Society of Architectural Hardware Consultants who shall be responsible for the complete finish hardware contract.
- B. Design Criteria:
1. Match the existing lock and latch set manufacturer and keying system, where applicable.
 2. Where the finish, shape, size, or function of a member receiving finish hardware is such as to prevent the use of, or make unsuitable the types specified, furnish similar types having as nearly as practicable the same operation.
 3. If finish hardware for any location is not specified, provide finish hardware equal in design and quality to adjacent finish hardware for comparable openings.
 4. Furnish finish hardware items of proper design for use on doors and frames of the thickness, profile, swing, security, and similar requirements, as necessary for proper installation and function.
 5. Contractor shall bring to Engineer's attention any item of finish hardware which cannot be installed or will not function properly.
 6. Unless otherwise specified, comply with the National Builders Hardware Association, "Recommended Locations for Builders Hardware."
 7. For fire rated openings, provide hardware complying with NFPA 80. Provide hardware which has UL approval for the intended use.
- C. Requirements of Regulatory Agencies:
1. Codes: Comply with the applicable requirements of the New York State Uniform Fire Prevention and Building Code for the types of finish hardware specified.
- D. Source Quality Control: To the greatest extent possible, obtain each type of finish hardware from only one manufacturer. Locksets, latch sets, and cylinders must originate from the same manufacturer.
- E. Reference Standards: Comply with the applicable provisions and recommendations of the following except where otherwise shown or specified:

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

1. FS TT-S-001657, Sealing Compound - Single Component, Butyl Rubber Based, Solvent Release Type.
2. National Builders Hardware Association, Recommended Locations for Builders Hardware.
3. NFPA Standard No. 80, fire doors and windows.

1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval the following, in accordance with Division 1:
1. Copies of manufacturer's data for each item of finish hardware. Include whatever information may be necessary to show compliance with requirements and include instructions for installation and for maintenance of operating parts and exposed finishes. Wherever needed, furnish templates to fabricators of other work which is to receive finish hardware.
 2. Copies of the finish hardware schedule, in the manner and format specified, complying with the actual construction progress schedule requirements (for each draft). Include a separate key schedule, showing clearly how the Owner's final instructions on keying of locks have been fulfilled. Finish hardware schedules are intended for coordination of the Work. Review and acceptance by the Engineer does not relieve the Contractor of their exclusive responsibility to fulfill the requirements as shown and specified.
 3. Based on the finish hardware requirements specified, organize the final finish hardware schedule into "hardware sets," indicating complete designation of every item required for each door or opening. Furnish initial draft of schedule at the earliest possible date, in order to facilitate the fabrication of other work (such as hollow metal frames) which may be critical in the Project construction schedule. Furnish final draft of schedule after samples, manufacturer's data sheets, coordination with Shop Drawings for other work, delivery schedules and similar information have been completed and accepted.
- B. Samples: Prior to submittal of the final hardware schedule and prior to delivery of hardware, submit one sample of each exposed hardware unit, finished as required, and tagged with full description for coordination with the schedule. Sample will be reviewed by Engineer for design, color, and texture only. Compliance with other requirements is the exclusive responsibility of the Contractor.
- C. Owner's Replacement Stock: Samples submitted which are approved by the Engineer will be forwarded to the Owner for use as replacement stock.
- D. Prepare a keying schedule in consultation with the Owner.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery of Materials:

1. Deliver finish hardware sufficiently in advance of its setting for proper inspection.
2. Pack each piece of finish hardware separately, complete with screws, keying, instructions, and templates, tagged to correspond with the approved finish hardware schedule.

B. Storage of Materials:

1. Provide secure lock-up for finish hardware stored at the site, but not yet installed.
2. Store finish hardware in manufacturers' original packages.

C. Handling of Materials: Control the handling and installation of finish hardware items which are not immediately replaceable, so that the completion of the Work will not be delayed by finish hardware losses, both before and after installation.

1.5 JOB CONDITIONS

A. Scheduling: Deliver individually packaged finish hardware items at the proper time to the proper locations for installation.

B. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory prepared for the installation of hardware work to confirm that adequate provisions are made for the proper installation of hardware.

C. Coordination: Coordinate hardware with other work. Tag each item or package separately, with identification related to the final hardware schedule, and include basic installations in the package. Furnish hardware items of proper design for use on doors and frames of the thicknesses, profile, swing, security and similar requirements indicated, as necessary for proper installation and function.

1.6 SUBSTITUTIONS

A. Do not make substitutions after Engineer's approval of final finish hardware schedule.

PART 2 - PRODUCTS

2.1 MATERIALS AND FABRICATION

A. General:

1. Hand of Door: The Drawings show the swing or hand of each door leaf (left, right, reverse bevel, etc.). Furnish each item of finish hardware for proper installation and operation of the door swing as shown.
2. Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable nameplates).
3. Base Metals: Produce finish hardware units of the basic metal and forming method specified, using the manufacturer's standard metal alloy, composition, temper and hardness. Do not substitute materials or forming methods for those specified.
4. Fasteners: Manufacture finish hardware to conform to published templates, generally prepared for machine screw installation. Do not provide finish hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.
5. Furnish screws for installation, with each finish hardware item. Provide Phillips flat-head screws except as otherwise specified. Finish exposed (exposed under any condition) screws to match the hardware finish or, if exposed in surfaces of other work, to match the finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
6. Provide fasteners which are compatible with both the unit fastened and the substrate, and which will not cause corrosion or deterioration of finish hardware, base material or fastener.
7. No exposed fasteners on hardware units shall be visible when doors are closed, except to the extent no standard manufacturer units of the type specified are available with concealed fasteners. Do not use through bolts for installation where the bolt head or the nut on the opposite face is exposed in other Work under any condition, except where it is not possible to adequately reinforce the Work and use machine screws or concealed fasteners of another standard type to satisfactorily avoid the use of through bolts.
8. Tools for Maintenance: Furnish a complete set of specialized tools as needed for Owner's continued adjustment, maintenance, removal and replacement of finish hardware.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

9. Field Checks: Make periodic checks during installation of finish hardware to ascertain the correctness of the installation. After completion of the work, certify in writing that all items of finish hardware have been installed, adjusted and are functioning in accordance with Specification requirements.
 10. Hardware shall be as indicated on Hardware Schedule on the drawings.
- B. Mortise Hinge:
1. Templates and Screws: Provide only template-produced units.
 2. Base Metal: Except as otherwise specified, fabricate hinges from stainless steel and finish to match the latch and lock set. Set 1: Dark Bronze finish. Set 2: Chrome finish
 3. Number of Hinges: Except as otherwise specified, provide two hinges on each door leaf of less than 60 inches and an additional hinge for each 30 inches or fraction thereof.
 4. Hinge Size: Except as otherwise specified or as required to comply with UL and NFPA, provide hinges of the following sizes:
 - a. Interior Doors: Maximum 48 inches wide: 5-inch heavy weight (0.190 inch)
 - b. Exterior Doors: Maximum 48 inches wide: 6-inch heavy weight (0.203 inch).
 - c. All hinges for 1 3/4 inch thick doors shall be 4 1/2 inches wide in the open position. For other door thicknesses hinges shall be of width to permit unobstructed swing of the door.
 5. Types of Hinges: Provide full-mortise type, ball-bearing hinges swaged for mortise applications, inner leaf beveled, square cornered, unless manufacturer's recommendations indicate that half-mortise, half-surface, full-surface or other type should be used for the frame and door type or condition.
 6. Hinge Pins: Except as otherwise specified, provide hinge pins as follows:
 - a. Pins: Non-rising stainless steel.
 - b. Exterior Doors: Non-removable non-rising pins, modern type.
 - c. Tips: Flat button and matching plug with no horizontal lines, finished to match leaves.
 7. Product and Manufacturer: Provide one of the following:

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

- a. T4A3386 A5111 Stainless HVY by ASSA ABLOY
 - b. Or approved equal.
- C. Continuous Hinges
1. Hager Concealed 780-112HD AL, Heavy Duty
 2. Or approved equal.
- D. Non-Keyed Passage Latchset Interior Mortise Style: Provide interior doors with latch sets as specified below:
1. Strikes: Provide manufacturer's standard wrought steel box strike, for each location and use shown. Provide curved lip strikes, unless otherwise recommended by manufacturer, finished to match latch set trim.
 2. Material: Provide all stainless steel chassis, including heavy-duty cylindrical case, latch case and front.
 3. Backsets: Provide backset of 2 3/4 inches.
 4. Modify specified locks and latches to comply with UL, Building Materials Directory, and List of Inspected Fire Protection Equipment and Materials and NFPA No. 80 requirements.
 5. Finish: U.S. 32D satin on stainless steel. (or as noted otherwise)
 6. Operation: The latch bolt shall be retracted by knob from either side at all times.
 7. All locksets and latchsets, etc., shall be of one manufacturer's products. Design shall be Schlage Mortise style or approved equal.
 8. Product and Manufacturers: Provide one of the following:
 - a. Schlage L Series 1000, Function 9010.
 - b. Or approved equal.
- E. Storeroom Locksets, Exterior Mortise Style, Keyed: Provide exterior doors with lock and latch sets as specified below:
1. Material: Provide all stainless steel chassis, including heavy-duty cylindrical case, latch case and front.
 2. Backsets: Provide backset of 2 3/4 inches.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

3. Modify specified locks and latches to comply with UL, Building Materials Director, and List of Inspected Fire Protection Equipment and Materials and NFPA No. 80 requirements.
 4. Finish: U.S. 32D satin on stainless steel.
 5. Operation: The latch bolt shall be retracted by key outside or knob inside. The auxiliary latch shall deadlock the latch bolt when the door is closed. The inside knob shall be always free for immediate exit.
 6. All locksets, etc., shall be of one manufacturer's products. Design shall be Schlage keyed mortise style, or approved equal.
 7. Product and Manufacturers: Provide one of the following:
 - a. Best Locks, 7 pin core to match facility standards.
 - b. No substitutions.
- F. Privacy Lockset: Provide doors with lock and latch sets as specified below:
1. Material: Provide all stainless steel chassis, including heavy-duty cylindrical case, latch case and front.
 2. Backsets: Provide backset of 2 3/4 inches.
 3. Modify specified locks and latches to comply with UL, Building Materials Director, and List of Inspected Fire Protection Equipment and Materials and NFPA No. 80 requirements.
 4. Finish: U.S. 32D satin on stainless steel.
 5. Operation: Latch bolt operated by lever from either side except when outside lever is locked by inside turn or button. Operating inside lever, closing door or operating outside emergency release unlocks outside lever. Storeroom locks are used when the outside lever should be locked at all times.
 6. All locksets, etc., shall be of one manufacturer's products. Design shall be Schlage keyed mortise style, or approved equal.
- G. Product and Manufacturers: Provide one of the following:
1. Schlage L Series, Function 9040
 2. Or approved equal.
- H. Cylinders and Keying System:

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

1. Multiple-Building System: Match Owner's master.
 2. Equip all locks with manufacturer's standard 6-pin tumbler cylinder and provide Owner with four keys to match each tumbler assembly. All locksets shall be provided with either identical or independently keyed tumbler assemblies, as directed by Owner.
 3. Each key shall be stamped "Do Not Duplicate."
- I. Electrified Breakaway Lever(where applicable):
1. Manufacturer: Von Duprin E996L, or approved equal.
- J. Electrified Concealed Electrical Power Transfer:
1. Powder coat finish, predrilled hole in base.
 2. Concealed Electrical Power Transfer shall be provided, unless otherwise specified, as follows:
 - a. Securitron CEPT-10. Description - US32D, concealed, 10 wire, ANSI/UL10C listed,3 HR rated
 - b. Or approved equal.
- K. Exit Device:
1. Rim exit device with night latch lock (for locking)
 2. Certified to ANSI/BHMA A156.3 2014, Grade 1
 3. Manufacturer: Best Exit Device; match facility standard.
 4. No substitutions.
- L. Electric Strike for Exit Device:
1. For single doors: Von Duprin 6111
 2. For pair doors: Von Duprin 6121
 3. Or approved equal.
- M. Door Closers:
1. Provide all doors both active and inactive, with door closers.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

2. Size of Units: Except as otherwise specified, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather, and anticipated frequency of use. Use adjustable size closers, changeable from size 2 through 6 and reversible for right or left hand doors.
 3. Use parallel arm arrangement for doors that would otherwise have the door closer appearing in finished corridors or entries.
 4. Provide hold open feature for all doors except fire rated doors.
 5. Provide long arm to allow door to swing 180 degrees where possible.
 6. Provide individual regulating valves for closing and latching speeds, and separate adjustable backcheck valve, preset at 75 degrees.
 7. Provide corner bracket on all exterior doors. Select arms to clear weatherstripping and overhead stops.
 8. Material: Heavy Duty Cast iron.
 9. Finish: Aluminum Enamel
 10. Product and Manufacturer: All closing devices and accessories are to be one manufacturer's products. Provide one of the following:
 - a. 281 Series Door Closers by Sargent Division of Walter Kidde and Company, Incorporated.
 - b. 1600SS Series Door Closers by Norton Security Products, Division of Scovill Industries.
 - c. Or approved equal.
- N. Overhead Stops: (where applicable or otherwise indicated on plans)
1. Provide heavy duty (30 pounds per square foot) overhead holder and stop with hold open feature on all exterior doors, both leafs. Comply with UL and NFPA requirements.
 2. Materials: Provide the following materials:
 - a. Shock Absorber Spring: Brass.
 - b. All Other Parts: Extruded bronze.
 3. Coordinate placement of overhead holder and stop with arm and bracket selection for door closers, for non-interference.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

4. Product and Manufacturer: Provide one of the following:
 - a. GJ 79HD Series Heavy Duty Overhead Door Holder by Glynn Johnson Corporation.
 - b. Or approved equal.
- O. Wall and Floor Stops:
 1. All doors shall have stops. Provide floor stops only where conditions preclude the use of wall stops.
 2. Materials: Stainless steel or brass chassis with gray rubber tip.
 3. Finish: US 32D Satin or US26D Satin, as scheduled.
 4. Provide concealed stainless steel fasteners as required by the substrate.
 5. Coordinate height of dome type floor mounted door stops with threshold condition and undercut of door.
 6. Product and Manufacturer: Provide one of the following (except where otherwise specified):
 - a. 408B wall-mounted concave series and 436 floor-mounted dome type series by Ives Company.
 - b. WB60MX wall-mounted concave series and I3X floor-mounted dome type series by Glynn Johnson Division of The Citation Companies.
 - c. Or approved equal.
- P. Coordinators:
 1. Provide coordinator device on all pairs of doors requiring automatic flush bolts. Comply with UL, List of Inspected Fired Protection Equipment and Material, and NFPA No. 80 requirements.
 2. Provide manufacturer's standard carry bar and strike on all pairs of doors equipped with coordinator.
 3. Materials: Bronze.
 4. Finish: Polished bronze.
 5. Product and Manufacturer: Provide one of the following:
 - a. CORG series by Ives Company.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

- b. COR 65 by Glynn-Johnson.
 - c. Or approved equal.
- Q. Stripping and Seals: (where applicable)
- 1. Provide perimeter weather stripping at all exterior doors and doors in walls forming hazardous spaces and as specified.
 - 2. Continuity of Stripping: Except as otherwise specified, it is required that the stripping at each opening be continuous and without unnecessary interruptions at door corners and hardware.
 - 3. Replaceable Seal Strips: It is required that the resilient or flexible seal strip of every unit be easily replaceable and readily available from stocks maintained by the manufacturer.
 - 4. Provide bumper type weather stripping at jambs and head, including a resilient insert and metal retainer strip, surface applied, of the following metal, finish and resilient bumper material:
 - a. Housing: Extruded aluminum with medium bronze anodized finish; 0.062-inch minimum thickness of main walls and flanges.
 - b. Seals: Silicone or vinyl.
 - 5. Product and Manufacturer: Provide one of the following:
 - a. No. 293AV by Pemko Manufacturing Company.
 - b. No. 129VDUR by Reese Enterprises, Inc.
 - c. Or approved equal.
 - 6. Provide automatic drop-seal sound-stripping door-bottom unit of manufacturer's standard design, with operating seal bar of the following material, retained in an extruded metal bar, and capable of operating to close a 3/4-inch gap (from door bottom to floor or threshold). House mechanism and operating bar in the following metal housing, for mounting on doors as follows:
 - a. Housing: Extruded aluminum, 0.062-inch thick, with medium bronze anodized finish on exposed surfaces.
 - b. Seal: Closed-cell sponge neoprene.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

- c. Mounting: Surface-mounted, except as otherwise indicated. Mount on stop-face of doors, except mount on hinge-face of swing-in exterior doors.
7. Product and Manufacturer: Provide one of the following:
- a. No. 430DS by Pemko Manufacturing Company.
 - b. No. 330DUR by Reese Enterprises, Inc.
 - c. Or equal.
- R. Astragals:
- 1. Provide metal and neoprene astragal for exposed flat head screw mounting on both leaves of all pairs of doors.
 - 2. Provide astragal of extruded aluminum, medium bronze anodized finish and black neoprene.
 - 3. Product and Manufacturer: Provide one of the following:
 - a. No. 375DR Series by Pemko Manufacturing Company.
 - b. No. 93DUR by Reese Enterprises, Incorporated (with additional screws through neoprene).
 - c. Or approved equal.
- S. Flush Bolts: (where applicable)
- 1. Provide flush bolts on the inactive leaf of all pairs of doors, at the top and bottom of door.
 - 2. Materials: Provide the following materials:
 - a. Flush Bolt Levers: Aluminum.
 - b. Flush Bolt Plate: Aluminum.
 - c. Flush Bolt Guide and Strike: Wrought brass.
 - d. Flush Bolt Rods: 1/2-inch round rods, bronze, 12-inch minimum length.
 - e. Bolt Head: Brass.
 - 3. All flush bolts furnished for labeled doors shall have UL approval.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

4. Provide extension flush bolts with 3/4-inch throws and with top bolt not over 6 feet above finished floor. Provide bottom flush bolt 12 inches long.
5. Product and Manufacturer: Provide one of the following:
 - a. 458 Flush Bolt by Ives Company.
 - b. Or approved equal.
- T. Automatic Door Bottom (where applicable): Surface mounted and adjustable.
 1. Zero 365AA
 2. Or approved equal.
- U. Thresholds:
 1. Provide thresholds on all exterior doors and doors in walls forming hazardous spaces and as specified on Door Schedule.
 2. Metal: Extruded aluminum, smooth commercial finish.
 3. Surface Pattern: Grooved tread, manufacturer's standard.
 4. Provide countersunk aluminum screws and expansion shields.
 5. Width: 5 inches wide and full width of opening.
 6. Construction: Single piece complying with manufacturer's recommendations.
 7. Profile: Provide manufacturer's standard flat unit with low profile. For doors equipped with panic hardware, including floor bolts, provide profile with stop bar of proper size and shape to function as the strike plate for the floor bolts.
 8. Thickness: 1/2-inch maximum.
 9. Product and Manufacturer: Provide one of the following:
 - a. 655,8655 and 655A-V3 by Pemko Manufacturing Company, for low profile.
 - b. S406A and S105 by Reese Enterprises, Incorporated.
 - c. Or approved equal.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

V. Latch Guard:

1. Rockwood 320-32D.
2. Or approved equal.

W. Silencers:

1. Provide silencers for all non-fire rated door frames. Refer to Section 08100, for number required.
2. Product and Manufacturer: provide one of the following:
 - a. No. 3446 by Sargent and Company.
 - b. No. 33 by Russwin, Division of Emhart Corporation.
 - c. Or approved equal.

X. Sealants: Provide butyl rubber sealant complying with FS TT-S-001657 for use with thresholds.

Y. Kick Plates: 8” high, stainless steel, on push side, unless otherwise indicated on drawings:

1. Ives 8400
2. Or approved equal.

Z. Rain Drip:

1. Provide rain drip for all exterior doors not protected by an overhang.
2. Metal: Extruded medium bronze anodized aluminum.
3. Provide projecting leg of 2 1/2 inches.
4. Product and Manufacturer: Provide one of the following:
 - a. R201 DUR by Reese Enterprises Incorporated.
 - b. 142 by Zero Weatherstripping Company, Incorporated.
 - c. Or equal.

AA. Push Plates and Pull Bars:

1. All push plates shall be 14-gauge by 3-inch by 12-inch wrought plates with beveled edges.
2. All pull bars shall be 3/8-inch by 1 1/4-inch by 6 3/8-inch bar, fastened to a back plate that matches the push plate.

2.2 HARDWARE FINISHES

- A. Provide matching finishes for finish hardware units at each door or opening, to the greatest extent possible. Reduce differences in color and textures as much as commercially possible where the base metal or metal forming process is different for individual units of finish hardware exposed at the same door or opening. In general, match all items to the manufacturer's standard finish for the latch and lock set for color and texture. All hardware and hinges shall have a US32D finish unless otherwise noted. All surface closers shall have a USP finish unless otherwise noted.

PART 3 - EXECUTION

3.1 GENERAL

A. Finish Hardware Schedule

Provide hardware for each door, each pair of doors, and each set of doors, in compliance with "Hardware Set Numbers" indicated in Door Schedule on Drawings, and as specified herein.

Manufacturer's names and product designations for hardware types are listed for the purpose of establishing minimum requirements. Provide the product specified or comparable product of other manufacturers listed in Art. 2.01 for each hardware type.

All door frames located in smoke partitions and fire-rated partitions shall be provided with continuous smoke seals at jambs and head, whether or not listed in Hardware Sets below. Manufacturer/model: Pemko S44D; McKinney S44D.

- B. Approval: As soon as practical after award of General Construction Contract and before a hardware schedule is prepared, and before any hardware is ordered or delivered to the project, the Contractor shall submit to the Engineer for their written approval, copies of sample list, listing each of the different items of builders' finishing hardware and catalog cuts of each item proposed.

3.2 KEYING

- A. Contractor shall provide Temporary Construction Cores in all locks for use during and throughout Construction.
- B. Contractor shall confirm with Owner the type of core used in other buildings in the facility so project's cores match.
- C. At Substantial Completion Engineer and Owner shall advise of Final Keying Arrangement.

3.3 INSPECTION

- A. Contractor shall examine the substrate to receive finish hardware and ascertain the conditions under which the Work will be performed, and notify the Engineer in writing of unsatisfactory conditions. Do not proceed with the finish hardware Work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.

3.4 PREPARATION

- A. Templates: Within 10 days after receipt of the approved hardware schedule, the hardware supplier shall furnish finish hardware templates to each fabricator of doors, frames, and other work to be factory prepared for the installation of finish hardware. Upon request, check the Shop Drawings of such other work, to confirm that adequate provisions are made for the proper installation of the finish hardware.

3.5 INSTALLATION

- A. Installation of all hardware shall be in a manner which will eliminate cracks on surfaces which could allow the growth of biological life by providing crevices and joints which can collect moisture and germs.
- B. Mount finish hardware units at heights recommended in, "Recommended Locations for Builders' Hardware," by National Builders Hardware Association, except as otherwise specified or required to comply with governing regulations.
- C. Install each finish hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install finish hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, re-install each item. Do not install surface-mounted items until finishes have been completed on the substrate.
- D. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

- E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- F. Cut and fit threshold and floor covers to profile of door frames, with mitered corners and hair-line joints. Join units with concealed welds or concealed mechanical joints. Cut smooth openings for spindles, bolts and similar items, if any.
- G. Screw thresholds to substrate with No. 10 or larger screws, of the proper type for permanent anchorage and of bronze or stainless steel which will not corrode in contact with the threshold metal.
- H. Set thresholds in a bead of butyl rubber sealant to completely fill concealed voids and exclude moisture from every source. Do not plug drainage holes or block weeps. Remove excess sealant.

3.6 ADJUSTMENT AND CLEANING

- A. Adjust and check each operating item of finish hardware and each door, to ensure proper operation or function of every unit. Lubricate moving parts with the type lubrication recommended by manufacturer (graphite-type if no other recommended). Replace units which cannot be adjusted and lubricated to operate freely and smoothly as intended for the application.
- B. Final Adjustment: Where finish hardware installation is made more than 1 month prior to acceptance or occupancy of a space or area, return to the Work during the week prior to acceptance or occupancy, and make a final check and adjustment of all finish hardware items in such space or area. Clean and relubricate operating items as necessary to restore proper function and finish of finish hardware and doors. Adjust door control devices to compensate for final operating of heating and ventilating equipment.
- C. Instruct Owner's personnel in proper adjustment and maintenance of finish hardware during the final adjustment of finish hardware.
- D. Finish hardware which is blemished or defective will be rejected even though it was set in place before defects were discovered. Remove and replace with new finish hardware. Repair all resultant damage to other work.
- E. Continued Maintenance Service: Approximately 6 months after the acceptance of finish hardware in each area, the Contractor, accompanied by the representative of the latch and lock manufacturer, shall return to the Project and re-adjust every item of hardware to restore proper function of doors and finish hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Clean and lubricate operational items wherever required. Replace finish hardware items which have deteriorated or failed due to faulty design, materials or installation of finish hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the finish hardware.

+ + END OF SECTION + +

SECTION 08 90 00
LOUVERS AND VENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Fixed, extruded-aluminum louvers.

1.3 DEFINITIONS

- A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.
- B. Horizontal Louver: Louver with horizontal blades; i.e., the axes of the blades are horizontal.
- C. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.
- D. Storm-Resistant Louver: Louver that provides specified wind-driven rain performance, as determined by testing according to AMCA 500-L.

1.4 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.
 - 1. Wind Loads: Determine loads based on pressures as indicated on Drawings.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes, without buckling, opening of joints, overstraining of

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

components, failure of connections, or other detrimental effects.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- C. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
1. Show weep paths, gaskets, flashing, sealant, and other means of preventing water intrusion.
 2. Show mullion profiles and locations.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of metal finish required.

1.6 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed according to AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.

1.7 QUALITY ASSURANCE

- A. Source Limitations: Obtain louvers and vents from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.
- B. Welding: Qualify procedures and personnel according to the following:
1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 2. AWS D1.3, "Structural Welding Code - Sheet Steel."

3. AWS D1.6, "Structural Welding Code - Stainless Steel."

C. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T5, T-52, or T6.

B. Fasteners: Use types and sizes to suit unit installation conditions.

1. Use Phillips flat-head screws for exposed fasteners unless otherwise indicated.

2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.

3. For fastening galvanized steel, use hot-dip-galvanized steel or 300 series stainless-steel fasteners.

4. For fastening stainless steel, use 300 series stainless-steel fasteners.

5. For color-finished louvers, use fasteners with heads that match color of louvers.

C. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed, for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.2 FABRICATION, GENERAL

A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

- B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.
 - 1. Horizontal Mullions: Provide horizontal mullions at joints where indicated.
- C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.
- D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
 - 1. Frame Type: Channel unless otherwise indicated.
- E. Include supports, anchorages, and accessories required for complete assembly.
- F. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer, or 72 inches o.c., whichever is less.
 - 1. Semirecessed Mullions: Where indicated, provide mullions partly recessed behind louver blades so louver blades appear continuous. Where length of louver exceeds fabrication and handling limitations, fabricate with interlocking split mullions and close-fitting blade splices designed to permit expansion and contraction.
 - 2. Exterior Corners: Prefabricated corner units with mitered blades with concealed close-fitting splices and with semirecessed mullions at corners.
- G. Provide subsills made of same material as louvers or extended sills for recessed louvers.
- H. Join frame members to each other and to fixed louver blades with fillet welds concealed from view unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.3 FIXED, EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal Storm-Resistant, Sight-proof, Louver (Exterior louvers only):
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Air Balance Inc.; a Mestek company.
 - b. Air Flow Company, Inc.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

- c. Airolite Company, LLC (The).
 - d. All-Lite Architectural Products.
 - e. American Warming and Ventilating, Inc.; a Mestek company.
 - f. Arrow United Industries; a division of Mestek, Inc.
 - g. Construction Specialties, Inc.
 - h. Greenheck Fan Corporation.
 - i. Industrial Louvers, Inc.
 - j. NCA Manufacturing, Inc.
 - k. Nystrom Building Products.
 - l. Reliable Products, Inc.
 - m. Ruskin Company; Tomkins PLC.
 - n. United Enertech Corp.
- 2. Louver Depth: 5 inches.
 - 3. Frame and Blade Nominal Thickness: Not less than 0.060 inch for blades and 0.080 inch for frames.
 - 4. Louver Performance Ratings:
 - a. Free Area: Not less than 5.0 sq. ft. for 48-inch- wide by 48-inch-high louver.
 - b. Air Performance: Not more than 0.10-inch wg static pressure drop at 600-fpm free-area exhaust /intake velocity.
 - c. Wind-Driven Rain Performance: Not less than 99 percent effectiveness when subjected to a rainfall rate of 8 inches per hour and a wind speed of 50 mph at a core-area intake velocity of 300 fpm.

2.4 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
 - 1. Screen Location for Fixed Louvers: Interior face.
 - 2. Screening Type: Insect screening.

CONTRACT NO. 22-522
DIVISION 8 – DOORS AND WINDOWS

- B. Secure screen frames to louver frames with machine screws with heads finished to match louver, spaced a maximum of 6 inches from each corner and at 12 inches o.c.
- C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
 - 1. Metal: Same kind and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
 - 2. Finish: Same finish as louver frames to which louver screens are attached.
 - 3. Type: Rewirable frames with a driven spline or insert.
- D. Louver Screening for Aluminum Louvers:
 - 1. Insect Screening: Aluminum, 18-by-16 mesh, 0.012-inch wire.

2.5 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2.6 ALUMINUM FINISHES

- A. Finish louvers after assembly.
- B. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Color and Gloss: As selected by Director's Representative.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

- A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Form closely fitted joints with exposed connections accurately located and secured.
- D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
- F. Protect unpainted galvanized and nonferrous-metal surfaces that will be in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.
- G. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 07 Section "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

- A. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.
- C. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

CONTRACT NO. 22-522

DIVISION 8 – DOORS AND WINDOWS

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

++ END OF SECTION ++

SECTION 09 29 00

CEMENT BOARD

PART 1 - GENERAL

1.1 CEMENTITIOUS BACKER PANEL

- A. Basis of Design: Subject to compliance with project requirements, the design is based on the following: Cement Board”.
- B. Classification: Cementitious Backer Units: ANSI A118.9, ASTM A108.11 and ASTM C 1325 provide with manufacturer's standard edges.
 - 1. Thickness: As indicated on the drawings.
 - 2. Board Length: 8 feet.
 - 3. Board Width: 48 inches.
 - 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
- C. Minimum bending radius: 6 feet.
- D. Fastener Requirements: Provide fasteners of size and type indicated that comply with requirements specified in this Section for material and application.
 - 1. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Sheathing SF steel drill screws with corrosion-resistant coating.
 - 2. Wood Screws: Sheathing WF screws with corrosion-resistant coating.
 - 3. Nails: 11-gauge hot-dipped galvanized roofing nails.
- E. Installation Requirements:
 - 1. For steel framing less than 0.0329 inch thick, attach sheathing to comply with ASTM C 1002.
 - 2. For steel framing from 0.033 to 0.112 inch thick, attach sheathing to comply with ASTM C 954.
- F. Standard:
 - 1. Cement board exceeds ANSI standards for cementitious backer units (CBU). See ANSI A118.9 for test methods and specifications for CBU and ANSI A108.11 for interior installation of CBU. Exceeds industry standards as an

exterior substrate for exterior finishes. Exceeds ASTM C1325 standards for non asbestos fiber-mat reinforced cementitious backer units.

1.2 COMPOSITION AND MATERIALS

- A. Cement board is formed in a continuous process of aggregated portland cement slurry with polymer-coated, glass-fiber mesh completely encompassing edges, back and front surfaces. The edges are formed smooth. The ends are square cut.

1.3 DELIVERY AND STORAGE OF MATERIALS

- A. All materials should be delivered and stored in their original unopened package and stored in an enclosed shelter providing protection from damage and exposure to the elements. Even though the stability and durability of cement board is unaffected by the elements, moisture and temperature variations may have an effect on the bonding effectiveness of basecoats and adhesives. Store all cement board panels flat.

1.4 ENVIRONMENTAL CONDITIONS

- A. In cold weather and during cement board panel and tile installation, temperatures within the building shall be maintained within the range of 40 to 100°F. Adequate ventilation shall be provided to carry off excess moisture.

1.5 INTERIOR APPLICATIONS

- A. The building shall be enclosed and the HVAC system operating so that wood framing shall reach the moisture content it will reach in service. Do not install board when the board is wet.

1.6 EXTERIOR APPLICATIONS

- A. In exterior applications, cement board should not be left uncovered for a period of time exceeding 90 days. Discoloration or staining may occur due to exposure to the elements which will not affect performance of the panel. Finishes, leveling/skim coats and basecoats should not be applied to cement board panel that is wet or frozen or that contains frost. After application, and for at least 24 hours, finishes, leveling/skim coats and basecoats should be effectively protected from rain and excessive moisture. In cold weather and during finish applications, cement board panel, skim or basecoat, mortar, finish material and air temperature must be at least 40°F and must remain at this temperature or higher for at least 24 hours after application. Hot and dry weather may affect working time of leveling/skim or basecoat and finish materials. Under rapid drying conditions, dampening or light fogging of board, leveling/ skim or basecoat surface may be required to improve workability.

1.7 PANEL MICROCRACKING

- A. Cement board is formulated to develop fine microcracking (also called as multiple cracking) in the panel. The microcracking process helps to evenly relieve the stored strain energy in the product due to handling and installation, external loads and/or panel restrained movement. The presence of microcracks in the panel should not be considered a product defect.
- B. Installation:
1. Install cement board with ends and edges closely abutted, but not forced together. Stagger end joints in successive courses.
 2. For flooring applications over a wood-based substrate, laminate cement board to subfloor using Type 1 organic adhesive or latex-modified thin-set mortar suitable for bonding cement board. Fasten to subfloor with 1-1/4" Tile Backer Screws for wood framing (or equivalent) or 1-1/2" hot-dipped galvanized roofing nails spaced 8" o.c. in both directions with perimeter fasteners at least 3/8" and less than 5/8" from ends and edges. Drive nails and screws so that bottoms of heads are flush with panel surface to ensure firm panel contact with subfloor. Do not overdrive fasteners. Prefill joints with tile-setting mortar or adhesive and then immediately embed Tile Backer Tape and level joints.
 3. For wall application, fasten cement board panels to framing with specified fasteners. Drive fasteners into field of panels first, working toward ends and edges. Hold panels in firm contact with framing while driving fasteners. Space fasteners maximum 8" o.c. for walls, 6" o.c. for ceilings, with perimeter fasteners at least 3/8" and less than 5/8" from ends and edges. Drive nails and screws so bottoms of heads are flush with panel surface to ensure firm panel contact with framing. Do not overdrive fasteners. Approved fasteners include: tile backer screws for steel framing (or equivalent), 1-1/4" and 1-5/8" for 14- to 20-gauge steel framing; tile backer screws for wood framing (or equivalent), 1-1/4", 1-5/8" and 2-1/4" for wood framing. Nails (1-1/2" hot dipped galvanized roofing nails). Prefill joints with tile-setting mortar or adhesive and then immediately embed tile backer tape and level joints.
 4. Cement board should be cut to size with a knife and straight edge. A power saw should be used only if it is equipped with a dust-collection device. Installer should wear NIOSH/MSHA approved dust mask.
 5. If waterproofing is desired, use *Waterproofing Membrane* (CB595) for product information.

C. Limitation:

1. Designed for positive or negative uniform loads up to 60 psf. For complete information on the use of panels in exterior systems, consult uniform load table on Page 4 for applicable positive or negative uniform loads on wall systems.
2. Wall applications: Maximum stud spacing: 16" o.c. (24" o.c. for cavity shaft wall assembly). Framing shall be designed (based on stud properties alone) not to exceed L/360 deflection for tile and thin brick, L/240 for direct-applied exterior finish systems. Maximum fastener spacing: 8" o.c. for wood and steel framing; 6" o.c. for ceiling applications.
3. Floor applications: Maximum joist spacing 24" o.c. The subfloor system should be designed with a minimum deflection limit of L/360 for the span. Some finish materials may require a more rigid subassembly (such as large format tile and natural stone products). In these cases, follow the manufacturer's minimum requirements. The subfloor should be APA Span-Rated Plywood or OSB with an Exposure 1 classification or better with tongue and groove or back blocked at the unsupported edges.
4. In exterior applications, cement board should not be left uncovered for a period of time exceeding 90 days. Discoloration or staining may occur due to exposure to the elements which will not affect performance of the panel.
5. Brittle coatings, such as epoxy coatings, are not recommended for use with cement board. Cement board is intended for use with tile, thin brick and exterior stucco coatings only.
6. Maximum dead load for ceiling system is 7.5 psf.
7. Steel framing must be 20-gauge equivalent or heavier.
8. Do not use drywall screws or drywall nails. Do not use drywall joint tape.
9. Do not use 1/4" cement board for wall or ceiling applications.
10. Do not use cement board with vinyl flooring.
11. Cement board is not designed for use as a structural panel.
12. Maximum installed weight of the finish system should not exceed 15 psf.
13. Cement board panels should not be used in areas where they are exposed to temperatures that exceed 200°F.
14. In locations close to salt water or other challenging environments, design professionals should consider the use of stainless steel fasteners.

15. Do not use lightweight setting-type joint compounds or ready-mix joint compounds directly over cement board.

D. Technical Data

Property	Unit of Measure	ASTM Test Method	5/8" USG Cement Board	1/2" Cement Board	1/4" Cement Board
Flexural strength	PSI	C947	>480	>750	>1000
Indentation strength	PSI	D2394	>1250	>1250	>1250
Shear bond strength	PSI	ANSI A118.4	>50	>50	>50
Water absorption	% by wt.24hrs	C473	15	15	15
Nail-pull resistance	Lb. (0.375" head diameter, wet or dry)	C473	>90	>90	-
Weight	PSF	C473	3	2.4	<1.9
Freeze / thaw resistance	Procedure B, number of cycles with no deterioration	C666	100	100	100
Mold resistance	-	G21 D3273	Rating O, No growth 10/10	Rating O, No growth 10/10	Rating O, No growth 10/10
No combustibility	Pass/Fail	E136	Pass	Pass	Pass
Surface-burning characteristics	Flame/smoke	E84	0/0	0/0	0/0
Thermal	"R" / k value	C518	.49/1.27	0.39/1.27	-
Standard method for evaluating ceramic floor tile installation systems	Passes cycles 1-6	C627	Light commercial	Light commercial	Light commercial

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

Property	Unit of Measure	ASTM Test Method	5/8" USG Cement Board	1/2" Cement Board	1/4" Cement Board
Minimum bending radius	Ft. (requires special framing details available upon request)	-	6	6	-

1.8 UNIFORM LOAD—1/2" USG DUROCK® BRAND CEMENT BOARD

Stud Spacing	Fastener Spacing	Design Wind Load (1/240)	Design Wind Load (1/360)
12" O.C	8" O.C	45 psf	45 psf
	6" O.C	60 psf	60 psf
16" O.C	8" O.C	33 psf	30 psf
	6" O.C	45 psf	30 psf
24" O.C (for shaft wall assemblies only)	8" O.C	13 psf	9 psf
	6" O.C	13 psf	9 psf

++ END OF SECTION ++

SECTION 09 67 23
RESINOUS FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Definitions: Resinous flooring includes penetrating, moisture tolerant, two-component epoxy primer, a high performance, three-component, chemical resistant mortar consisting of bisphenol F epoxy resin, curing agent and selected, graded aggregates blended with inorganic pigments, a two-component, chemical resistant bisphenol F epoxy coating and a selected, graded, large grit silica aggregate.
- B. Related Work
 - 1. Section 03 30 00, Concrete Cast in Place
 - 2. Section 07 92 00, Joint Sealers

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data, installation instructions, and general recommendations for each resinous flooring material required. Include certification indicating compliance of materials with requirements.
- B. Samples: Submit, for verification purposes, 4-inch square samples of each type of resinous flooring required, applied to a rigid backing, in color and finish indicated.
 - 1. For initial selection of colors and finishes, submit manufacturer's color charts showing full range of colors and finishes available.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain primary resinous flooring materials including primers, resins, hardening agents, finish or sealing coats from a single manufacturer with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Contractor shall have completed at least five projects of similar size and

complexity; Stonhard or approved equal. Provide secondary materials only of type and from source recommended by manufacturer of primary materials.

B. Pre-Installation Conference

1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
2. Attendance
 - a. General Contractor
 - b. Architect/Owner's Representative
 - c. Manufacturer/Installer's Representative

C. ISO 9001: All materials, including primers, resins, curing agents, finish coats, aggregates and sealants are manufactured and tested under an ISO 9001 registered quality system.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Material shall be delivered to job site and checked by flooring contractor for completeness and shipping damage prior to job start.
- B. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.
- C. Material shall be stored in a dry, enclosed area protected from exposure to moisture. Temperature of storage area shall be maintained between 60 and 85°F/16 and 30°C.

1.6 PROJECT CONDITIONS

- A. Concrete substrate shall be properly cured for a minimum of 30 days. A vapor barrier must be present for concrete subfloors on or below grade. Otherwise, an osmotic pressure resistant grout must be installed prior to the resinous flooring.
- B. Utilities, including electric, water, heat (air temperature between 60 and 85°F/16 and 30°C) and finished lighting to be supplied by General Contractor.
- C. Job area to be free of other trades during, and for a period of 24 hours, after floor installation.
- D. Protection of finished floor from damage by subsequent trades shall be the responsibility of the General Contractor.

1.7 WARRANTY

- A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of one (1) full year from date of installation.

PART 2 - PRODUCTS

2.1 COLORS

- A. Colors: As selected by Architect from manufacturer's standard colors. (or as indicated on drawing)

2.2 EPOXY FLOORING

- A. Stonclad HT coated with Stonkote HT4 with Texture #3 as manufactured by Stonhard, Inc., Maple Shade, NJ, (800) 257-7953 is a nominal 1/4"/6mm thick system comprised of a penetrating, moisture tolerant, two-component epoxy primer, a high performance, three-component, chemical resistant mortar consisting of bisphenol F epoxy resin, curing agent and selected, graded aggregates blended with inorganic pigments, a two-component, 100% solids, chemical resistant, bisphenol F epoxy coating and a selected, graded, large grit silica aggregate.

- 1. Physical Properties: Provide flooring system in which physical properties of topping including aggregate, when tested in accordance with standards or procedures referenced below, are as follows:

Compressive Strength..... 11,500 psi
(ASTM C-579)

Tensile Strength..... 2,200 psi
(ASTM C-307)

Flexural Strength 5,000 psi
(ASTM C-580)

Hardness 87-90
(ASTM D-2240/Shore D Durometer)

Impact Resistance > 160 in. lbs.
(ASTM D-4226)

Abrasion Resistance 0.08 gm max. weight loss
(ASTM D-4060, Taber
Abrader CS-17 wheel)

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

Coefficient of Friction	0.80
(ASTM D-2047/Neoprene-Dry)	
Flexural Modulus of Elasticity	1.7 x 10 ⁶ psi
(ASTM C-580)	
Flammability.....	Self Extinguishing
(ASTM D-635)	Extent of burning 0.25 inches max.
Thermal Coefficient of Linear Expansion	2.0 x 10 ⁻⁵ in/in°C
(ASTM C-531)	
Water Absorption	0.2%
(ASTM C-413)	
Heat Resistance Limitation.....	200°F/93°C
(for continuous exposure)	250°F/122°C
(for intermittent spills)	
Cure Rate allow	8 hours for foot traffic
(at 77°F/25°C)	24 hours for normal operations

2.3 JOINT SEALANT MATERIALS

- A. Type produced by manufacturer of resinous flooring system for type of service and joint condition indicated.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Substrate: Concrete preparation shall be by mechanical means and include use of a scarifier or shot blast machine for removal of bond inhibiting materials such as curing compounds or laitance.

3.2 APPLICATION

- A. General: Apply each component of resinous flooring system in compliance with manufacturer's directions to produce a uniform monolithic wearing surface of thickness indicated, uninterrupted except at divider strips, sawn joints or other types of joints (if any), indicated or required.
- B. Primer: Mix and apply primer over properly prepared substrate with strict adherence to manufacturer's installation procedures and coverage rates.

Coordinate timing of primer application with application of troweled mortar to ensure optimum adhesion between resinous flooring materials and substrate.

- C. Troweled Mortar: Mix mortar material according to manufacturer's recommended procedures. Uniformly spread mortar over substrate using manufacturer's specially designed screed box adjusted to manufacturer's recommended height. Hand trowel apply mixed material over freshly primed substrate using stainless steel finishing trowels.
- D. Coating/Texture: Remove any surface imperfections by lightly abrading and vacuuming the floor surface. Mix coating according to manufacturer's recommended procedures. Squeegee apply and backroll coating with strict adherence to manufacturer's installation procedures and coverage rates. Broadcast silica aggregate into freshly rolled coating. Allow coating to cure and apply a second layer of coating according to manufacturer's recommended procedures.

3.3 FIELD QUALITY CONTROL

- A. The right is reserved to invoke the following material testing procedure at any time, and any number of times during period of flooring application.
- B. The Owner will engage service of an independent testing laboratory to sample materials being used on the job site. Samples of material will be taken, identified and sealed, and certified in presence of Contractor.
- C. Testing laboratory will perform tests for any of characteristics specified, using applicable testing procedures referenced herein, or if none referenced, in manufacturer's product data.
- D. If test results show materials being used do not comply with specified requirements, Contractor may be directed by Owner to stop work; remove non-complying materials; pay for testing; reapply flooring materials to properly prepared surfaces which had previously been coated with unacceptable materials.

3.4 CURING, PROTECTION AND CLEANING

- A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.
- B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

- C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer.

++ END OF SECTION ++

SECTION 09 90 00

PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Scope:

1. The General Contractor shall furnish all labor, materials, equipment and incidentals required to provide painting as shown and specified.
2. The extent of painting work may be determined by referring to the Contract Drawings, site inspections, other specification sections and as described in this Section.
3. The Work includes the painting and finishing of all exposed new interior and exterior surfaces including, but not limited to, the following:
 - a. All structural and framing members.
 - b. Miscellaneous metals, pipe sleeves and pipe hangers.
 - c. All new exposed piping, fittings, valves and insulation in new and/or existing building(s) as shown on the Contract Drawings and directed by Owner or Engineer.
 - d. All new equipment and associated piping.
 - e. Exposed wood and rough carpentry
 - f. Doors and frames.
 - g. Seal coating building floor and new exposed concrete.
 - h. Interior surfaces of masonry and brick walls.
 - i. Interior walls and ceilings of new structures.
 - j. Interior Gypsum and Cement Board Surfaces.
 - k. All work specified to be painted as directed by Owner or Engineer, whether or not specifically listed herein.

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

4. Surface preparation, priming and coats of paint specified are in addition to shop priming and surface treatment specified under this and other sections of the Work.
5. The term “paint” as used herein means all coating system materials, which includes pretreatment, primers, emulsions, enamels, stains, varnishes, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
6. The exposed surfaces of all work shall be painted, whether or not colors are designated in any schedule, except where the natural finish of the material is specifically noted as a surface not to be painted. Unless otherwise noted, the term “exposed” as used herein means all items not covered with concrete. Where items or surfaces are not specifically mentioned, paint these the same as adjacent similar materials or areas.
7. All exposed structural members appurtenances, as indicated by the contract drawings and the specifications, which are customarily painted, shall be painted with not less than one shop coat and two field coats, or one prime coat and two finish coats of the appropriate paint.
8. Structural and miscellaneous metals covered with concrete, shall only receive a coating compatible with the covering material.
9. Piping and equipment identification for all new piping and equipment.

B. Coordination:

1. Review installation procedures under other Sections and coordinate the installation of items that must be field painted in this Section.
2. Coordinate the painting of areas that are inaccessible once equipment has been installed.
3. Provide finish coats which are compatible with the prime paints used. Review other Sections of these Specifications in which prime paints are to be provided to ensure compatibility of the total coatings system for the various substrates. Contractor shall be responsible for the compatibility of all shop primed and field painted items. Furnish information on the characteristics of the finish materials proposed for use to ensure that compatible prime coats are used. Provide barrier coats over incompatible primers or remove and reprime as required. Notify the Engineer in writing of anticipated problems using the coating systems as specified with substrates primed by others.
4. Manufacturers of equipment to receive finish coating in the shop shall submit color charts with shop drawings for color selection by the Owner.

- C. Related Work Specified Elsewhere:
1. Section 07 92 00, Sealants.
 2. Equipment markers in appropriate equipment section.
- D. Painting Not Included: The following categories of Work are not included as part of the field-applied finish Work or are included in other Sections of these Specifications or in other contracts.
1. Shop Priming: Unless otherwise specified, shop priming of structural metal, miscellaneous metal fabrications, other metal items and such fabricated components as shop-fabricated or factory-built heating and ventilating, instrumentation and electrical equipment or accessories shall conform to applicable requirements of Section 09900 but is included under the appropriate Sections of the Specifications.
 2. Prefinished Items: Unless otherwise shown or specified, do not include painting when factory finishing such as baked-on enamel, baked-on phenolic resin, porcelain, polyvinyl fluoride or other similar finish is specified for such items as, but not limited to, finished mechanical and electrical equipment such as conduits, fans, ductwork, light fixtures and distribution cabinets, aluminum doors and other equipment. Contractor shall be required to touch-up factory finished items with paint supplied by the item manufacturer. Contractor shall field paint damaged prefinished items as directed by the Engineer.
 3. Metal surfaces of aluminum, stainless steel, chromium plate, bronze, copper, and similar finished materials will not require finish painting, unless otherwise shown or specified.
 4. Operating Parts and Labels:
 - a. Moving parts of operating units, mechanical and electrical parts such as valve and damper operators, linkages, sensing devices, motor and fan shafts do not require finish painting unless otherwise shown or specified.
 - b. Do not paint over any code-required labels, such as UL and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.
 - c. Remove all paint, coating or splatter inadvertently placed on these surfaces.

1.2 QUALITY ASSURANCE

- A. Manufacturer: Provide products manufactured by one of the following:
1. Tnemec Company, Incorporated.
 2. Sherwin Williams
 3. Or equal.
- B. Applicator Qualifications:
1. Submit the name and experience record of the painting applicator. Include a list of utility or industrial installations painted, responsible officials, architects, or engineers concerned with the project and the approximate contract price.
 2. Painting applicators whose submissions indicate that they have not had the experience required to perform the Work will not be approved.
- C. Source Quality Control: Obtain all materials from the same manufacturer unless otherwise approved. Obtain materials only from manufacturers who will:
1. Provide the services of a qualified manufacturer's representative at the project site at the commencement of Work to advise on materials, installation and finishing techniques.
 2. Certify long-term compatibility of all coatings with all substrates, both new and existing.
- D. Reference Standards: Comply with applicable provisions and recommendations of the following, except where otherwise shown or specified:
1. ANSI/NSF Standard 61.
 2. ANSI A13.1, Scheme for the Identification of Piping Systems.
 3. OSHA 1910.144, Safety Color Code for Marking Physical Hazards.
 4. AMPP volume 2, Systems and Specifications, Surface Preparation Guide and Paint Application Specifications.
 5. Great Lakes - Upper Mississippi River Board of State Public Health and Environmental Managers Engineers (Ten States Standards), Recommended Standards for Water Works - Latest edition, Painting of Water Works Piping for Public Water Supplies.

E. Manufacturer's Guarantee:

1. The identification signs and nameplates shall be guaranteed in writing by the manufacturer against color fading, chipping, corroding or any other manufacturing defects for a period of ten (10) years.

F. Concrete Floor Mock-Up:

1. Prior to application of concrete floor coating, but after Engineer's approval of floor coating system, the Contractor shall coat a section of the new concrete floor using the approved aggregate and coating specified for final work. Mock-up shall be provided at the site in a location approved by the Engineer. The mock-up shall be of full coating thickness and approximately 5 feet long by 5 feet wide unless otherwise shown. The mock-up shall indicate the proposed range of texture and workmanship to be expected in the completed work. The Contractor shall obtain Engineer's and Owner's acceptance of coating qualities of the mock-up before start of concrete floor coating work. Retain and protect mock-up floor area during construction as a standard for judging completed floor coating work. Do not alter, move or destroy mock-up until given written permission by Engineer. Concrete floor coatings that do not meet the approved mock-up coating area shall be removed and recoated as required by the Engineer.

1.3 SUBMITTALS

A. Samples: Submit for approval the following:

1. Paint samples for Engineer's review of color and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor. Provide a listing of the material and application for each coat of each finish sample.
2. Piping and Equipment Identification:
 - a. Submit to the Engineer for approval each type of tag proposed and the manufacturer's standard color chart and letter styles. Tags shall have stamped on them the information shown on the valve schedules.

B. Shop Drawings: Submit for approval the following:

1. Copies of manufacturer's technical information, including paint label analysis and application instructions for each material proposed for use.
2. Copies of Contractor's proposed protection procedures in each area of the Work.

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

3. List each material and cross-reference to the specific paint and finish system and application. Identify by manufacturer's catalog number and general classification.
 4. Copies of manufacturer's complete color charts for each coating system.
 5. Maintenance Manual: Upon completion of the Work, furnish copies of a detailed maintenance manual including the following information:
 - a. Product name and number.
 - b. Name, address and telephone number of manufacturer and local distributor.
 - c. Detailed procedures for routine maintenance and cleaning.
 - d. Detailed procedures for light repairs such as dents, scratches and staining.
 6. Pipe Markers: Copies of manufacturer's technical brochure, including color chart and list of standard markers.
- C. Certificates: Submit for approval the following:
1. Certificates stating that materials meet or exceed Specification requirements.
 2. Certificate stating that all coatings are compatible with substrate specified, and factory or field applied prime coats.
 3. Safety Data Sheets (SDS), for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. SDS shall indicate the Volatile Organic Compound (VOC) limits of products submitted (If an SDS does not include a product's VOC content, then product data sheets, manufacturer literature, or a letter of certification from the manufacturer can be submitted in addition to the SDS to indicate the VOC content).

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials: Deliver all materials to the job site in original, new and unopened packages and containers bearing manufacturer's name and label, and the following information.
1. Name or title of material.
 2. Manufacturer's stock number and date of manufacture.

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

3. Manufacturer's name.
4. Contents by volume, for major pigment and vehicle constituents.
5. Batch Numbers
6. Thinning instructions where recommended.
7. Application instructions.
8. Color name and number.

B. Storage of Materials:

1. Store only acceptable project materials on project site.
2. Store in a suitable location approved by the Paint Manufacturer and accepted by the Owner. Keep area clean and accessible.
3. Restrict storage to paint materials and related equipment.
4. Comply with health and fire regulations including the Occupational Safety and Health Act of 1970.

C. Handling:

1. All waste and paint rags shall be kept in tightly covered metal containers and the contents shall be safely disposed of at the end of each working day in accordance with all applicable federal, state and local laws and regulations.
2. A sufficient number of approved type fire extinguishers shall be provided adjacent to the storage area.

1.5 JOB CONDITIONS

A. Existing Conditions:

1. Before painting is started in any area, it shall be broom cleaned and excessive dust shall be removed, and damp surfaces shall be dried.
2. Some existing surfaces may exhibit failing coatings, i.e. peeling, chipped and/or cracked. Paint shall be removed to provide clean adhered surface.
3. After painting operations begin in a given area, broom cleaning will not be allowed; cleaning shall then be done only with commercial vacuum cleaning equipment.

B. Environmental Requirements:

1. Apply water base paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 55°F and 90°F unless otherwise permitted by the paint manufacturer's printed instructions.
2. Apply other paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 65°F and 95°F, unless otherwise permitted by the paint manufacturer's printed instructions.
3. Do not apply paint in snow, rain, fog, or mist or when the relative humidity exceeds 85 percent or to damp or wet surfaces, unless otherwise permitted by the paint manufacturer's printed instructions.
4. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.
5. Adequate illumination and ventilation shall be provided in all areas where painting operations are in progress.
6. Install piping markers only after all painting and finish Work has been completed.

C. Protection: Cover or otherwise protect finished work of other trades and surfaces not being painted concurrently or not to be painted.

D. Manufacturer's Field Service: A qualified representative of the manufacturer shall be available to instruct the painters on any special requirements or techniques for the application of the paints, coatings, etc., at no additional cost to the Owner. Prior to starting any painting, the Contractor shall supply, for use by the Engineer, two wet film thickness gauges and one digital dry film thickness gauge.

PART 2 - PRODUCTS

2.1 MATERIAL QUALITY

A. Provide the best grade of the various types of coatings suitable for use in water supply and water treatment plants and as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying the manufacturer's identification as a standard, best-grade product will not be acceptable.

- B. Provide primers produced by the same manufacturer as the finish coats. Use only thinners recommended by the paint manufacturer, and use only to recommended limits.
- C. Provide paints, and pipe markers of durable and washable quality. Use materials which will withstand normal washing as required to remove grease, oil, chemicals, etc., without showing discoloration, loss of gloss, staining, or other damage.

2.2 SUBSTITUTIONS

- A. No substitutions shall be considered that decrease the film thickness, the number of coats, the surface preparation or the generic type of coating specified. Approved manufacturers must furnish the same color selection as the manufacturers specified, including accent colors in all coating systems.
- B. No substitutions of paint containing volatile organic compounds (VOCs) shall be considered where paint is specified which does not contain VOCs.

2.3 COLORS AND FINISHES

- A. Surface treatments, and finishes, are specified under “Painting Systems” below. All substrates scheduled under “Painting Systems” shall be painted whether or not shown on the Contract Drawings, or in Schedules, unless an item is specifically scheduled as not requiring the painting system scheduled below.
- B. Color Selection:
 - 1. Many different colors shall be selected for the Project, in addition to color coding of all piping.
 - 2. The Owner reserves the right to select nonstandard colors for all paint systems specified within the ability of the manufacturer to produce such nonstandard colors. Selection of nonstandard colors shall not be cause for the Contractor rejecting Owner’s color selections and the Contractor shall supply such colors at no additional expense to the Owner.
- C. After approval of submittals and prior to beginning Work, the Engineer will furnish color schedules for surfaces to be painted listed in the painting systems below.
- D. Color Coding: In general, and unless otherwise specified, all color coding of piping, and equipment shall comply with applicable standards of ANSI A13.1, OSHA 1910.144 and the Ten States Standards, Recommended Standards for Water Works, Current Edition.
- E. Color Pigments: Pure, nonfading, applicable types to suit the substrates and service indicated.

1. Lead: Lead content shall not exceed amount permitted by federal, state and local government laws and regulations.
- F. All painting systems specified are based on brush application except as noted or specified. Other mechanical techniques shall be submitted to the Engineer for approval before these application techniques may be reflected in any paint schedules submitted by the Contractor. Submit proof of acceptability of technique proposed by the paint manufacturer selected.

2.4 PAINTING SYSTEMS

- A. Interior CMU walls (unless otherwise specified): Sealer shall be applied with 3/8”-3/4” nap lambswool or solvent resistant cover and not sprayed.
1. Surface Preparation: Remove grease, oil and all foreign matter as specified in Section 3.2.
 2. Product and Manufacturer: Provide one of the following:
 - a. KOP-COAT:
 - 1) Primer: Epoxy Block Filler - 1 coat, 10.0 dry mils per coat.
 - 2) Finish: Hi-Gard - 2 coats, 3.0-4.0 dry mils per coat. Second coat on floors to provide a skid resistant finish.
 - b. Tnemec:
 - 1) Primer: Series 130 Envirofill - 1 coat, 10.0 dry mils.
 - 2) Finish: Series V69 H.B. Epoxoline - 2 coats, 3.0-4.0 dry mils per coat. Second coat on floors to provide a skid resistant finish.
 - c. Sherwin Williams:
 - 1) Primer: Pro Industrial HD Block Filler – 1 coat, 8-10 mils dft.
 - 2) Finish: Macropoxy 646 FC Epoxy – 2 coats, 3-5 mils dft per coat. Second coat on floors to provide a skid resistant finish.
 - d. Or approved equal.
- B. Factory Primed Structural Steel Members; interior non-Submerged:

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

1. Surface Preparation: Remove chalk, loose paint, grease, oil, rust, scale, all foreign matter, as specified in Section 3.2.
 2. Product and Manufacturer: Provide one of the following:
 - a. Tnemec:
 - 1) Shop Holding Primer: Building Manufacturer's choice
 - 2) Field Primer or field touchup over holding primer: Tnemec Series 115 - 1 coat, 2.0-4.0 dry mils per coat.
 - 3) Finish: Tnemec Series 1029, 2 coats, 2.0-3.0 dry mils per coat.
 - b. Sherwin Williams:
 - 1) Field touch up Primer: Pro Industrial ProCryl Universal Primer – 1 coat, 2-3.5 mils dft.
 - 2) Finish: Shercryl HPA, 2 coats, 2-3 dry mils per coat.
 - c. Or approved equal
- C. Ferrous Metals and all Ferrous Piping; Interior Nonsubmerged:
1. Surface Preparation: Blast Cleaning as specified in Section 3.2.
 2. Product and Manufacturer: Provide one of the following:
 - a. Tnemec:
 - 1) Shop Primer: Series V69 H.B. Epoxoline - 1 coat, 3.0-5.0 dry mils per coat.
 - 2) Field Primer or Field Touch-up: Series V69 H.B. Epoxoline - 1 coat, 3.0-5.0 dry mils per coat.
 - 3) Finish: Series V69 H.B. Epoxoline - 2 coats, 3.0-5.0 dry mils per coat.
 - b. Sherwin Williams:
 - 1) Shop Primer: Macropoxy 646 FC Epoxy - 1 coat, 3.0-5.0 dry mils per coat.

- 2) Field Primer or Field Touch-up: Macropoxy 646 FC Epoxy - 1 coat, 3.0 – 5.0 dry mils per coat.
 - 3) Finish: Macropoxy 646 FC Epoxy, 2 coats, 3.0 – 5.0 dry mils per coat.
- c. Or approved equal.
- D. Ferrous, Nonferrous Metals, and Galvanized Metals; Exterior Nonsubmerged:
1. Surface Preparation:
 - a. Ferrous Metals: Blast Cleaning as specified in Section 3.2.
 - b. Galvanized and Nonferrous Metal: Cleaning as specified in Section 3.2.
 2. Product and Manufacturer: Provide one of the following:
 - a. Tnemec:
 - 1) Primer:
 - a) Ferrous Metals: Series V69 H.B. Epoxoline - 1 coat, 3.0-5.0 dry mils per coat.
 - b) Nonferrous and Galvanized: None.
 - 2) Intermediate: Series V69 H.B. Epoxoline - 1 coat, 4.0-5.0 dry mils.
 - 3) Finish: Series 1095 Endura-Shield Aliphatic Acrylic Polyurethane - 1 coat, 2.0-3.0 dry mils.
 - b. Sherwin Williams:
 - 1) Shop Primer: Macropoxy 646 FC Epoxy - 1 coat, 3.0-5.0 dry mils per coat.
 - 2) Field Primer or Field Touch-up: Macropoxy 646 FC Epoxy - 1 coat, 3.0-5.0 dry mils per coat.
 - 3) Finish: High Solids Polyurethane 250, 1 coat, 3.0-4.0 dry mils per coat.

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

- E. Galvanized Metal and Nonferrous Metals; Interior, Nonsubmerged:
 - 1. Surface Preparation: Cleaning, as specified in Section 3.2.
 - 2. Product and Manufacturer: Provide one of the following:
 - a. Tnemec:
 - 1) Primer: Series V69 H.B. Epoxoline - 1 coat, 2.0-3.0 dry mils.
 - 2) Finish: Series V69 H.B. Epoxoline - 1 coat, 2.5-3.5 dry mils.
 - b. Sherwin Williams:
 - 1) Primer: Macropoxy 646 FC Epoxy- 1 coat, 2.0-4.0 dry mils per coat.
 - 2) Finish: Macropoxy 646 FC Epoxy, 1 coat, 2.0-4.0 dry mils per coat.
 - c. Or approved equal.
- F. Submerged or Intermittently Submerged Ferrous Metals; Interior and Exterior.
 - 1. Surface Preparation: Cleaning, as specified in Section 3.2.
 - 2. Product and Manufacturer: Provide one of the following:
 - a. Tnemec:
 - 1) Primer/Finish: Series 22 - 1 coat, 24.0-30.0 dry mils per coat.
 - b. Sherwin Williams
 - 1) Primer/Finish: Sherplate PW Epoxy – 1 coat, 25.0-35.0 dry mils per coat.
 - c. Or approved equal.
- G. All Aluminum in contact with Dissimilar Materials:
 - 1. Surface Preparation: Remove all foreign matter. SSPC-SP1, solvent cleaned.
 - 2. Product and Manufacturer: Provide one of the following:

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

- a. Tnemec:
 - 1) Series V69 H.B. Epoxoline - 2 coats, 2.0-3.0 dry mils per coat.
 - b. Sherwin Williams:
 - 1) Macropoxy 646 FC Epoxy - 2 coats, 2.0 - 4.0 dry mils per coat.
 - c. Or approved equal.
- H. Ferrous Metals, Buried Exterior:
- 1. Surface Preparation: SSPC-SP 10, Near-White Blast, as specified in Section 3.2.
 - 2. Product and Manufacturer: Provide one of the following:
 - a. Tnemec:
 - 1) Shop Primer: Series V69 H.B. Epoxoline - 1 coat, 3.0-5.0 dry mils per coat.
 - 2) Field Primer or Field Touchup: Surface preparation as specified.
 - 3) Finish: Series 46H-413 H.B. Tneme-Tar - 2 coats, 8.0-10.0 dry mils per coat.
 - b. Sherwin Williams:
 - 1) Shop Primer: Macropoxy 240 - 1 coat, 3.0-5.0 dry mils per coat.
 - 2) Finish: TarGuard Coal Tar Epoxy, 2 coats, 8.0 - 10.0 dry mils per coat.
 - c. Or approved equal.
- I. New and existing Interior Concrete Floors and equipment pads: Sealer shall be applied with 3/8"-3/4" nap lambswool or solvent resistant cover and not sprayed.
- 1. Surface Preparation: Remove grease, oil and all foreign matter as specified in Section 3.2.
 - 2. Product and Manufacturer:

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

- a. GP 3477 Epoxy Water Emulsion Primer/Sealer by the Sherwin Williams Company (two coats).
 - b. L&M Sealhard by Laticrete International.
 - c. Or approved equal.
- J. New Interior Concrete Floors: Paint shall be applied with a brush or roller and not sprayed.
1. Surface Preparation: Remove grease, oil and all foreign matter as specified in Section 3.2.
 2. Product and Manufacturer: Provide one of the following:
 - a. Tnemec:
 - 1) Primer: Series V69 H.B. Epoxoline – 2 coats, 3.0-4.0 dry mils per coat.
 - 2) Finish: Series V69 H.B. Epoxoline - 2 coats, 3.0-4.0 dry mils per coat.
 - b. Sherwin Williams:
 - 1) Primer: Macropoxy 646 FC Epoxy – 1 coat, 3.0-5.0 dry mils per coat.
 - 2) Finish: Macropoxy 646 FC Epoxy - 2 coats, 3.0-5.0 dry mils per coat.
 - c. Or approved equal.
- K. New Interior Concrete Block and Masonry Walls and Trim: Paint shall be applied with a brush or roller and not sprayed.
1. Surface Preparation: Remove grease, oil and all foreign matter as specified in Section 3.2.
 2. Product and Manufacturer: Provide one of the following:
 - a. Tnemec:
 - 1) Primer: Series 130 EnviroFill Block Filler - 1 coat, 10.0 dry mils.

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

- 2) Finish: Series V69 H.B. Epoxoline - 2 coats, 3.0-5.0 dry mils per coat.
 - b. Sherwin Williams:
 - 1) Primer: Pro Industrial Heavy Duty Block Filler - 2 coats, 8.0 – 10.0 dry mils per coat.
 - 2) Finish: Macropoxy 646 FC Epoxy - 2 coats, 3.0-5.0 dry mils per coat.
 - c. Or approved equal.
- L. New Exterior Masonry Clear Coating:
1. Surface Preparation: Remove Mortar and efflorescence as specified in Section 3.2.
 2. Product and Manufacturer: Provide one of the following:
 - a. Hydrozo Clear Double 7 by Hydrozo Coatings Company (2 coats).
 - b. Thompson's Water Seal by E.A. Thompson Company (2 coats).
 - c. Conflex 7% Siloxane CF31T0007, by Sherwin Williams (1 Flood coat)
 - d. Or approved equal.
- M. New Cement Wallboard, Exposed Finish Carpentry, Interior:
1. Surface Preparation:
 - a. Remove all foreign matter.
 - b. Fill voids created by securement devices with joint compound to achieve smooth surface.
 - c. Apply joint tape and joint compound to all lateral joints and at perimeter of ceilings.
 - d. Sand joint compound with fine grit, open coated sandpaper to provide a smooth, flat surface. If additional joint finishing is required to provide a smooth, flat surface, the same joint compound or a ready mix spackling compound should be used.
 - e. Remove dust by wiping with clean rags.

2. Product and Manufacturer: Provide the following:
 - a. Tnemec:
 - 1) Primer: Series 151-1051 Elasto-Grip FC - 1 coat, 1.0-2.0 dry mils per coat.
 - 2) Finish: Series 113 or 114 H.B. Tneme Tufcoat - 2 coats minimum, 4.0-5.0 total dry film thickness.
 - b. Sherwin Williams:
 - 1) Primer: ProMar 200 Zero VOC Primer – 1 coat, 1.0 – 2.0 dry mils per coat.
 - 2) Finish: Pro Industrial Water Based Catalyzed Epoxy – 2 coats, 3.0 – 4.0 dry mils per coat.
 - c. Or approved equal.

2.5 PIPING AND EQUIPMENT IDENTIFICATION

A. Identification Signs:

1. Lettering of Titles:
 - a. Letter size shall be as indicated in the following table:

<u>Outside Diameter of Pipe or Covering</u>	<u>Size of Legend</u>
3/4-in to 1-1/2-in	1/2-in
1-1/2-in to 2-in	3/4-in
2-1/2-in to 6-in	1-1/2-in
8-in to 10-in	2-1/2-in
Over 10-in	3-in
 - b. Letter type shall be Gothic Capital, upper case. Arrow shall match letter type and size. Colors of lettering and backgrounds shall match colors listed below.
2. Sign Materials:
 - a. Signs and arrows shall be pressure sensitive vinyl tape with pressure sensitive vinyl tape banding. Banding in humid areas, as determined by the Engineer shall be stainless steel.

- b. Product and Manufacturer: Provide one of the following:
 - 1) Opti-Code Special Markers by Seton Name Plate Corporation.
 - 2) Custom Self-sticking Marker System by W.H. Brady Company.
 - 3) Or approved equal.
 3. Titles for Equipment:
 - a. Titles shall be provided on all equipment using 1-inch high letters same style and materials as specified above. Where more than one piece of the equipment item to be titled exists, the items shall be numbered consecutively as indicated on the mechanical drawings or as directed by the Engineer. Titles shall be composed in more than one line if required and justified on the left hand side as follows (for example):

PUMP NO. "X"
 4. Metal Tags: For valves and pipelines smaller than 3/4-inch in diameter, securely fasten metal tags, 2-1/2-inch by 1/2-inch, of 17 Birmingham Stubs Gauge Brass with lettering etched and filled with enamel. Tags shall be approved by the Engineer.
- B. Additional Signs and Nameplates:
1. In addition to the legends specified herein the Engineer may order the Contractor to furnish and install additional identification signs, arrows and nameplates at no additional cost to the Owner. Such additional signs may be requested near completion of the Work and shall be limited to no more than 10 signs for each of the types specified. The legends and color combinations for additional signs shall conform to the requirements specified herein.
- C. Legend for Valve Tags:
1. The Contractor shall be responsible for furnishing and installing tags for all valves required for their own work. Contractor shall submit to the Engineer a valve schedule containing all valves required for their work. The schedule shall contain for each valve, the location, type, a number, words to identify the valve's function, type of operator and the normal operating position. The information contained in the valve schedules shall be coded on the tags in a system provided by the Engineer. Each valve shall be coded and identified by the Engineer utilizing a combination of up to twelve letters and numbers.

D. Colors:

1. Standard Colors: Pipe line signs, equipment nameplates and finish coats of paint for pipe lines and equipment shall be coded in basic colors. Colors shall be brilliant, distinctive shades matching the following safety colors in accordance with ANSI Z53.1 color specifications for safety colors and other basic colors as hereinafter specified.

TABLE OF STANDARD COLORS

<u>Color</u>	<u>Designation</u>
White	Safety
Yellow	Safety
Orange	Safety
Red	Safety
Black	Safety
Blue	Safety
Green	Safety
Gray	ANSI No. 61
Brown	*
Light Green	**
Charcoal	***
Olive Green	****
Aqua	\$
Light Brown	\$\$
Dark Blue	\$\$\$

* The color “Brown” for paints shall be equivalent to Tnemec Terra Cotta 07RD.

** The color “Light Green” for paints shall be equivalent to Tnemec Aztec Grass 52GN.

*** The color “Charcoal” for paints shall be equivalent to Tnemec Deep Space GR34.

****The color “Olive” for paints shall be equivalent to Tnemec Balsam 91GN.

\$ The color “Aqua” for paints shall be equivalent to Tnemec Aqua Sky 10GN.

\$\$ The color “Light Brown” for paints shall be equivalent to Tnemec Desert Sands 04BR.

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

\$\$\$ The color “Dark Blue” for paints shall be equivalent to Tnemec Old Glory Blue 78BL.

2. Color of Pipe Lines:

- a. All pipe lines and equipment shall be painted in conformity with the requirements of this section and the paint schedules contained on the Drawings. The color of the final coats of paint shall be color coded.
- b. General Color Code: Unless otherwise specified, the following color code should be used:

<u>Pipe Line</u>	<u>Color</u>
Finished (potable) Water Piping	Blue
Raw Water Piping	Olive Green
Well/Booster Blowoff	Olive Green
PTAS Influent	Olive Green
PTAS Effluent / Booster Pump Influent	Olive Green
GAC Influent	Aqua
GAC Effluent	Aqua
GAC Blowoff	Light Brown
Backwash Waste	Light Brown
Clearwell Overflow	Aqua
Lube Water	Blue
Generator Engine Exhaust	Orange
Generator Fill and Vent	Red
Vent Pipes	Gray
Electrical Conduit	Gray
Natural Gas	Red
Carbon Fill	Gray
Carbon Suction	Gray
Pressure Relief	Gray
Air Release	Gray
Vent	Gray
Roof Drains	Black
Chlorine (gas and solution)	Yellow
Caustic	Yellow with Green Band

Vents and drains shall be in the same color combination as the contents of equipment vented and drained.

- c. The color of the final coats shall match as closely as possible without custom blending, the color tabulated under Background for the

specific pipe line service as given in the General Color Code tabulated previously.

- d. Where aluminum or stainless steel is specified for pipe, duct work or insulated jackets the exterior shall not be painted unless otherwise directed by the Engineer or Owner.
 - e. Flanges, flexible couplings, valves and fittings shall be painted with the specified color code.
- E. Spare Parts and Accessories:
- 1. Each contractor shall furnish the following spare parts and accessories:
 - a. For every 20 pipe identification signs installed:
 - 1) One complete mounting assembly.
 - b. For every 20 nameplates installed:
 - 1) One complete nameplate mounting assembly.
 - c. For every 20 valve identification tags:
 - 1) One stainless steel cable and splice.
 - 2. All spare parts and accessories shall be suitably boxed and marked for storage and reordering.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Contractor and their applicator shall examine the areas and conditions under which painting Work is to be performed and notify the Engineer in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film.

3.2 SURFACE PREPARATION

A. General:

1. Perform all preparation and cleaning procedures as specified herein and in strict accordance with the paint manufacturer's instructions for each particular substrate and atmospheric condition.
2. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish painted, or provide surface applied protection prior to surface preparation and painting operations. Remove, if necessary, for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, reinstall the removed items by workmen skilled in the trades involved.
3. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease with clean cloths and cleaning solvents prior to mechanical cleaning. Schedule the cleaning and painting so that dust and other contaminants from the cleaning process will not fall in wet, newly painted surfaces.
4. No interior painting shall be started until the structure has been enclosed, ventilated and thoroughly dried out, as approved by the Engineer. Apply materials under adequate illumination and ventilation. Special fans shall be provided when natural ventilation is insufficient and if required, face masks shall be provided for the painters. Written consent of the Engineer will be required before building fans may be used. Maintain temperature of rooms at 65°F minimum where varnish, lacquer or enamel is being applied and at 50°F minimum during other painting and finishing. No exterior painting shall be started in rainy, snowy, damp or frosty weather, or until surfaces are thoroughly dry. Exterior painting shall be done only when air temperature is 40°F or above and only in dry weather. Allow exterior paints and finishes to dry at least 48 hours between coats. Allow interior paints to dry at least 24 hours between coats or as otherwise indicated by the manufacturer. Allow enamels, lacquers and varnishes to dry at least forty-eight hours between coats. Remove dust well before succeeding coat is applied. Allow additional drying time if conditions warrant to assure that all coats are perfectly dry before applying succeeding coats. Remove or protect during painting all finish hardware, accessories, fixtures and similar items installed prior to painting and not required to be painted. If removed, carefully replace and adjust on completion of painting. All work shall be performed by experienced and competent painters in conformance with the requirements of the Specifications.

5. All surfaces which were not shop painted or which were improperly shop painted, and all abraded or rusted shop painted surfaces, which are to be painted, as determined by the Engineer, shall be prepared as specified below.

B. Ferrous Metals:

1. Clean ferrous surfaces including structural steel and miscellaneous metal to be shop primed, of all oil, grease, dirt, mill scale and other foreign matter by near-white blast cleaning complying with AMPP/SSPC-10.
2. Clean submerged ferrous surfaces including structural steel and miscellaneous metal to be shop primed, of all oil, grease, dirt, mill scale and other foreign matter by white blasting complying with AMPP/SSPC-SP 5.
3. Clean non-submerged, ferrous surfaces that have not been shop-coated of all oil, grease, dirt, loose mill scale and other foreign substances by near-white blast cleaning, complying with AMPP/SSPC-SP 10.
4. Clean submerged ferrous surfaces that have not been shop-coated or that, in the opinion of the Engineer, have been improperly shop coated, of all oil, grease, dirt, mill scale and other foreign matter by white blasting complying with AMPP/SSPC-SP 5.
5. Treat bare and blasted or pickled clean metal with metal treatment wash coat, prior to priming only if recommended by the paint manufacturer.
6. Touch-up shop-applied prime coats which have damaged or bare areas, with primer recommended by the coating manufacturer after commercial blasting complying with SSPC-SP 6.
7. Ferrous metals with existing coatings shall be prepared as specified in Section 3.2(E).

C. Nonferrous Metals Surfaces: Clean nonferrous surfaces in accordance with the coating system manufacturer's instructions for the type of service, metal substrate, and application required.

D. Galvanized Surfaces:

1. Render free from oil and surface contaminants with a nonpetroleum based solvent, recommended by the coating manufacturer, complying with AMPP/SSPC-SP 1.
2. Do not use chromate treatments on galvanized surfaces to be painted. Remove all chromate treatments by sanding or by other techniques as recommended by the paint manufacturer at no additional cost to the Owner.

E. Ferrous Surfaces with Existing Coatings:

1. General: All grease, oil heavy chalk, dirt, or other contaminants shall be removed by solvent or detergent cleaning prior to abrasive blast cleaning. The generic type of the existing coatings shall be determined by laboratory testing.
2. Abrasive Blast Cleaning: The Contractor shall provide the degree of cleaning specified in the coating system schedule for the entire surface to be coated. If the degree of cleaning is not specified in the schedule, deteriorated coatings shall be removed by abrasive blast cleaning to SSPC-SP6, Commercial Blast Cleaning. Areas of tightly adhering coatings shall be cleaned to AMPP/SSPC-SP7, Brush-off Blast Cleaning, with the remaining thickness of existing coating not to exceed 3 mils.
3. Incompatible Coatings: If coatings to be applied are not compatible with existing coatings the Contractor shall apply intermediate coatings per the paint manufacturer's recommendation for the specified coating system or shall completely remove the existing coating prior to abrasive blast cleaning. A small trial application shall be conducted for compatibility prior to painting large areas.
4. Unknown Coatings: Coatings of unknown composition shall be completely removed prior to application of new coatings.

F. Concrete surfaces:

1. Prepare concrete surfaces in accordance with AMPP/NACE No. 6/SSPC-SP13 Joint Surface Preparation Standards and ICRI Technical Guidelines. Abrasive blast, shot-blast, water jet or mechanically abrade concrete surfaces to remove laitance, curing compounds, hardeners, sealers and other contaminants and to provide a minimum ICRI-CSP 3 or greater surface profile. Large cracks, voids and other surface imperfections should be filled with a recommended filler or surfacer.

3.3 MATERIALS PREPARATION

A. General:

1. Mix and prepare painting materials in strict accordance with the manufacturer's directions.
2. Do not mix coating materials produced by different manufacturers, unless otherwise permitted by the manufacturer's instructions.

3. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing, and application of paint in a clean condition, free of foreign materials and residue.
4. Stir all materials before application to produce a mixture of uniform density, and as required during the application of the materials. Do not stir any film which may form on the surface into the material. Remove the film and, if necessary, strain the material before using.

3.4 APPLICATION

A. General:

1. Apply paint by brush or roller. Other mechanical application techniques such as air spray, or airless spray in accordance with the manufacturer's directions and recommendations of Paint Application Specifications No. 1 in SSPC Vol. 2 (or equivalent AMPP standard), where applicable shall be used only as approved by the Engineer. Use brushes best suited for the type of material being applied. Use rollers of carpet, velvet back, or high pile sheep's wool as recommended by the paint manufacturer for material and texture required.
2. The number of coats and paint film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has completely dried.
3. Apply additional coats when undercoats, stains, or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. This is of particular importance regarding intense primary accent colors. Ensure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a film thickness equivalent to that of flat surfaces.
4. Finish exterior doors on tops, bottoms, and side edges the same as the exterior faces, unless otherwise specified.
5. Install rubber gaskets to prevent contact between dissimilar metals. Paint aluminum parts in contact with dissimilar materials as specified with appropriate primer.
6. Use of thinners at any time shall have approval of the Engineer, Owner, and paint manufacturers.
7. Omit field primer on metal surfaces which have been shop primed; touch-up paint shop prime coats only when approved by Engineer.

- B. Heating, Ventilating and Electrical Work:
1. Ventilating items to be painted include, but are not limited to, the following:
 - a. Hangers and supports.
 - b. Motors, mechanical equipment and supports.
 - c. Accessory items.
 2. Electrical items to be painted include, but are not limited to, the following:
 - a. Switchgear, panels, junction boxes, motor control centers, motors and accessories.
- C. Minimum Coating Thickness: Apply each material at not less than the manufacturer's recommended spreading rate, and provide total dry film thickness as specified. Apply extra coat if required to obtain specified total dry film thickness.
- D. Scheduling Painting:
1. Apply the first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 2. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- E. Prime Coats: Recoat primed and sealed walls and ceilings where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects caused by insufficient sealing.
- F. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage.
- G. Brush Application:
1. Brush-out and work all brush coats onto the surfaces in an even film. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable. Neatly draw all glass and color break lines.
 2. Brush apply all primers and first coats, unless otherwise permitted to use mechanical applicators.

H. Mechanical Applicators:

1. Use mechanical methods for paint application when permitted by governing ordinances, paint manufacturer, and approved by Engineer. If permitted, limit to only those surfaces impracticable for brush applications.
2. Limit roller applications, if approved by the Engineer, to interior wall finishes for second and third coats. Apply each roller coat to provide the equivalent hiding as brush-applied coats.
3. Confine spray application to metal framework, siding, decking, wire mesh and similar surfaces where hand brush work would be inferior and to other surfaces specifically recommended by paint manufacturer.
4. Wherever spray application is used, apply each coat to provide the equivalent hiding of brush-applied coats. Do not double back with spray equipment for the purpose of building up film thickness of 2 coats in one pass.

I. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish, or repaint work not in compliance with specified requirements as required by the Engineer.

J. Paint Work:

1. Undercoats shall be of approximate shade of final coat, but each coat shall be of slightly different tint. Each coat shall be inspected and approved before application of the succeeding coats, otherwise no credit for coat applied will be given and the work in question shall be recoated.
2. Finished surface shall be uniform in finish and color and free from brush marks, sagging, rippling and other imperfections. Should any coat be judged unsatisfactory, the coat shall be sandpapered or otherwise cleaned off and another coat applied. If the undercoating is disturbed, complete refinishing will be required.
3. Finish all returns, edges and recesses which will be exposed in the finished work and which will be seen from any angle to match the adjacent work.
4. Edges of paint or finish adjoining other materials or colors shall be sharp and clean without overlapping. Should workmanship be found defective, proper preparatory work shall be done and additional coats applied as necessary to give a finish in accordance with specified requirements.

- K. After completion of each coat of paint, Contractor shall notify Engineer. After inspection, checking of film thickness and approval by Engineer, proceed with the succeeding coat.

3.5 PROTECTION

- A. Furnish and lay drop cloths in all areas where painting work is being done to protect floors and all other adjacent work and materials from defacement.
- B. Protect the installed work and the work of other contractors, whether to be painted or not, from the Work of this Section. Leave all such work undamaged. Correct all damages by cleaning, repairing or replacing, and repainting, as acceptable to the Engineer.
- C. Provide “Wet Paint” signs as required to protect newly painted finishes. Remove all temporary protective wrappings provided for protection of this contract and other contracts after completion of painting operations.

3.6 CLEANUP

- A. During the progress of the Work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each workday.
- B. Upon completion of painting Work, clean all paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.
- C. At the completion of work of other trades, touch-up and restore all damaged or defaced painted surfaces as determined by the Engineer.

3.7 INSTALLATION OF PIPE AND EQUIPMENT IDENTIFICATION SIGNS, NAMEPLATES AND TAGS

- A. The name of the materials in each pipeline and, alongside this, an arrow indicating the direction of flow of fluids, shall be indicated on each pipe system. Titles shall also appear directly to each side of any wall the pipeline breaches, adjacent to each side of the valve, pump, filter, chemical tank, and all pieces of equipment. Pipe marking labels and arrows shall be located at intervals not to exceed 30 continuous linear feet apart, including any fraction thereof:
 - 1. Material of Construction:
 - a. Acrylic plastic with UV inhibitor.
 - b. One piece.

CONTRACT NO. 22-522
DIVISION 9 – FINISHES

- c. Visibility - 360° on pipe sizes less than 6-inch diameter.
 - d. Minimum legend Display on pipe circumference - 4.
 - e. Mounting/Installation:
 - 1) For pipes less than 6-inch dia. snap-type with no glues, adhesives or straps.
 - 2) For pipes 6-inch dia. and larger - strap-around with nylon ties.
 - f. Letter size shall conform to ANSI STD.A13.1.
2. Product and Manufacturer:
- a. Set Mark Pipe Markers as distributed by Seton Name Plate Co., New Haven, Connecticut.
 - b. Or approved equal.
- B. Titles shall identify the contents by complete name at least once in each space through which it passes and thereafter by generally recognized abbreviations, letters or numerals as approved by the Engineer. Identification title locations shall be determined by the Contractor but in general they shall be placed where the view is unobstructed and on the two lower quarters of pipe or covering where they are overhead. Titles should be clearly visible from operating positions especially those adjacent to control valves.
- C. Signs on large valves shall be located on or adjacent to the valve itself. Tags for smaller valves shall be attached to bonnet or flange bolts. Attachment of tags or signs to handwheels of valves will not be permitted.
- D. Nameplates shall be located on equipment bases and on structures at readily visible levels in such positions relative to the equipment and structures as to prevent damage to the nameplate.

3.8 GUARANTEE

- A. All work under this Section of the Specifications shall be guaranteed against checking, cracking, peeling, discoloration or other defects due to improper materials, or workmanship, due to improper preparation of the surfaces, or due to the painting, varnishing, etc., of surfaces which were not in proper condition to receive paint, varnish or other painter's materials and such unsatisfactory work shall be refinished in accord with the Guarantee requirements of the Contract Documents.

++ END OF SECTION ++

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SECTION 10 14 23

PANEL SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Building-identification signs.
- B. Related Requirements:
 - 1. Section 01 33 00, Submittals
 - 2. Section 01 77 16, Contract Closeout
 - 3. MEP and Electrical Sections

1.3 DEFINITIONS

- A. Accessible: In accordance with the accessibility standard.

1.4 COORDINATION

- A. Furnish templates for placement of sign-anchorage devices embedded in permanent construction by other installers.
- B. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For panel signs.
 - 1. Include fabrication and installation details and attachments to other work.
 - 2. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.

3. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.
- C. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.
1. Include representative Samples of available typestyles and graphic symbols.
- D. Sign Schedule: Use same designations specified or indicated on MEP Drawings and coordinate with Owner the Building Name and Number for sign mounted on exterior wall.
- 1.6 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer.
- 1.7 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For signs to include in maintenance manuals.
- 1.8 QUALITY ASSURANCE
- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- 1.9 FIELD CONDITIONS
- A. Field Measurements: Verify locations of anchorage devices embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.
- 1.10 WARRANTY
- A. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image.
 - c. Separation or delamination of sheet materials and components.
 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- B. Accessibility Standard: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities for signs.

2.2 SIGNS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated or comparable product by one of the following:
 - 1. Signmojo.com, 2156 Amnicola Hwy, Chattanooga, TN 37406, 800.348.1349
- C. Panel Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
 - 1. Basis-of-Design Product: “Santera” by Signmojo.com, 2156 Amnicola Hwy, Chattanooga, TN 37406, 800.348.1349, as indicated on Drawings.
 - 2. Composite Phenolic-Core Sign: Solid phenolic panel core with integral subsurface graphic image covered with integral, polymeric face layer.
 - a. Composite-Sheet Thickness: Manufacturer's standard for size of sign.
 - 3. Mounting: Manufacturer's standard method for substrates indicated
Surface mounted to wall with concealed anchors.
 - 4. Surface Finish and Applied Graphics:
 - a. Integral Sheet Color: As selected by Director's Representative from full range of industry colors.
 - 5. Text and Typeface: Accessible raised characters and Braille.
 - 6. Flatness Tolerance: Sign panel shall remain flat or uniformly curved

under installed conditions as indicated and within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner.

- D. Room-Identification Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
1. Basis-of-Design Product: “Santera” by Signmojo.com, 2156 Amnicola Hwy, Chattanooga, TN 37406, 800.348.1349
 2. Sign-Panel Perimeter: Finish edges smooth.
 - a. Edge Condition: Beveled.
 - b. Corner Condition in Elevation: Square.
- E. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signage, noncorrosive and compatible with each material joined, and complying with the following:
1. Use concealed fasteners and anchors unless indicated to be exposed.
 2. For exterior exposure, furnish stainless-steel devices unless otherwise indicated.
 3. Exposed Metal-Fastener Components, General:
 - a. Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
 - b. Fastener Heads: For nonstructural connections, use screws and bolts with tamper-resistant one-way-head slots unless otherwise indicated.
 4. Sign Mounting Fasteners:
 - a. Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.
 - b. Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.
 5. Inserts: Furnish inserts to be set by other trades into concrete or masonry work.
- F. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.3 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
 - 1. Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
 - 2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
 - 3. Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.
 - 4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
 - 5. Internally brace signs for stability and for securing fasteners.
 - 6. Provide rebates, lugs, and brackets necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

2.4 GENERAL FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.
- D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.
- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
- C. Verify that anchor inserts are correctly sized and located to accommodate signs.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.
 - 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Install signs so they do not protrude or obstruct according to the accessibility standard.
 - 3. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
 - 4. Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- B. Room-Identification Signs and Other Accessible Signage: Install in locations on walls according to accessibility standard.
- C. Mounting Methods:
 - 1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
 - a. Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface, embedding studs in holes. Temporarily support sign in position until adhesive fully sets.

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SECTION 10 44 16

PORTABLE FIRE PROTECTION EQUIPMENT

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall provide all labor, materials, equipment and incidentals as shown, specified, and required to furnish and install portable fire extinguishers.
2. The locations of the portable fire extinguishers are shown on the Drawings and specified herein.
3. The types of portable fire extinguishers required include the following:
 - a. Multi-purpose dry chemical extinguishers.

B. Coordination:

1. Coordinate the installation-of items that must be installed with the portable fire extinguishers.

1.2 QUALITY ASSURANCE

- A. Source Quality Control: Furnish portable fire extinguishers and accessories from only one manufacturer.
- B. Requirements of Regulatory Agencies: Provide only portable fire extinguishers that are approved and labeled by UL in accordance with the State of New York Official Compilation of Codes, Rules and Regulations.
- C. Reference Standards: Comply with applicable provisions and recommendations of the following, except where otherwise shown or specified.
 1. UL, Fire Classification Rating.

1.3 SUBMITTALS

A. Shop Drawings: Submit for approval the following:

1. Copies of manufacturer's technical data, certification of UL rating, and installation instructions for all portable fire extinguishers required.

1.4 RELATED WORK SPECIFIED ELSEWHERE

A. Section 01 33 00, Submittals

B. Section 01 74 00, Construction Waste Management

PART 2 - PRODUCTS

2.1 FIRE EXTINGUISHERS

A. General: Provide manufacturer's standard mounting bracket for portable fire extinguishers size as required.

B. Multi-Purpose Dry Chemical:

1. 20-pound capacity, enameled steel container with pressure indicating gauge, for Class A, Class B and Class C fires, UL rating 20A-120 BC.
2. Effective discharge time shall be 20 seconds minimum.
3. Manufacturer: Provide one of the following:
 - a. Model Cosmic 20E as manufactured by J. L. Industries.
 - b. Or equal.

C. Signs: Provide styrene, Y-shaped signs.

1. Background: White.
2. Lettering: "FIRE EXTINGUISHER," red or black.
3. Symbol: Of fire extinguisher, red.
4. Size: 7 inches by 12 inches.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Contractor and his installer shall examine the substrate and conditions under which the portable fire extinguisher Work is to be installed and notify Engineer in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to Engineer.

3.2 INSTALLATION

- A. Install wall mounted units in locations and at mounting of 3 feet-0 inches. Securely fasten to structure, square and plumb, in accordance with manufacturer's instructions.
- B. Wherever exact locations of units are not clearly established, locate as directed by Engineer.
- C. Install signs directly above portable fire extinguishers, securely mounted, attached to substrate in accordance with manufacturer's instructions. Install signs level and plumb.
- D. Inform County of next required inspection and recharging date.

3.3 SCHEDULE

<u>Type</u>	<u>Capacity (lbs)</u>	<u>Units</u>	<u>Location</u>
A	20	1	Near exit door

3.4 EXTINGUISHER TYPES

- A. Dry Chemical.

++ END OF SECTION++

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SECTION 22 05 00

COMMON WORK RESULTS FOR PLUMBING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. These basic requirements apply to all Division 22 00 00 Sections.
- B. The work of this Section consists of providing of all materials, labor and equipment and the like necessary and/or required for the complete execution of all Plumbing and related work for this project, as required by the contract documents.

1.02 RELATED SECTIONS

- A. Refer to Division 1 Specification.

1.03 REFERENCES

- A. ASHRAE – American Society of Heating, Refrigerating and Air Conditioning Engineers Guides and Standards, latest editions.
- B. ASPE - American Society of Plumbing Engineers.
- C. UL - Underwriters Laboratory.
- D. NFPA - National Fire Protection Association.

1.04 REGULATORY REQUIREMENTS

- A. Conform to New York State Building Code.
- B. Plumbing: Conform to New York State Plumbing Code and the Fuel Gas code
- C. Obtain permits, and request inspections from authority having jurisdiction.

1.05 QUALITY ASSURANCE

- A. The Contractor shall have the work indicated on the drawings and/or specified in each section performed by vendors or mechanics experienced and skilled in its implantation or by a “Specialist”, “Specialty Contractor” or “Specialty Subcontractor” under contractual agreement with the Contractor. These terms mean an individual or firm of established reputation, or, if newly organized, whose personnel have previously established a reputation in the same field, which is regularly engaged in, and which maintains a regular force of workmen skilled in either manufacturing or fabricating items required by the Contract, installing items required by the Contract, or otherwise performing work required by the Contract.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- B. Where the Contract Specifications require installation by a "Specialist," that term shall also be deemed to mean either the manufacturer of the item, an individual or firm licensed by the manufacturer, or an individual or firm who will perform such work under the manufacturer's direct supervision.

1.06 PROJECT/SITE CONDITIONS

- A. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- B. Prepare drawings showing proposed arrangement of Work to meet Project conditions, including changes to Work specified in other Sections.

1.07 SCOPE OF WORK

- A. This Contractor shall be responsible for coordinating his work with all other trades.
- B. The Contractor shall provide all materials, labor, equipment, tools, appliances, services, hoisting, scaffolding, supervision and overhead for the furnishing and installing of all mechanical work and related work including but not limited to the following:
- Plumbing Fixtures
 - Piping, Valves and fittings and specialties
 - Domestic systems
 - Drain, Waste, and Vent
 - Hangers and Supports.
 - Pipe Insulation
 - Identification
 - Coordination
 - Phasing
 - Shop Drawings
 - As-Built Drawings and Maintenance Manuals
 - Warrantees

PART 2 – PRODUCTS: NOT USED

PART 3 – EXECUTION

3.01 GENERAL

- A. Construct all apparatus of materials and pressure ratings suitable for the conditions encountered during continuous operation.
- B. Where corrosion can occur, appropriate corrosion resistant materials and assembly methods must be used including isolation of dissimilar metals against galvanic interaction. Resistance to corrosion must be achieved using the appropriate base materials. Coatings shall be restored to only when specifically permitted by the Specification.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- C. Construct all equipment in accordance with requirements of all applicable codes. All pressure vessels and safety devices that fall within the scope of the ASME Code shall conform to the Code and bear the ASME label or stamp.
- D. Match and balance all system components to achieve compatibility of equipment or satisfactory operation and performance throughout the entire operating temperature and control ranges. All installations shall be in accordance with manufacturer's recommendations.
- E. The contractor shall warranty all work, including labor and materials, and equipment furnished and installed as part of this contract for a minimum period of year from the date of acceptance by the owner, in writing. Certain equipment, such as underground fuel tanks, may have longer warranties as indicated in the specifications. In such cases the longer of the two warranties shall prevail.

3.02 SHOP DRAWINGS AND SUBMITTALS (COORDINATE WITH DIVISION 01)

- A. Shop drawings and samples shall be prepared and submitted in accordance with the requirements established in the contract and shall consist of all items listed in the following paragraph.
- B. Manufacturer's data or shop drawings giving full information as to dimensions, materials, and all information pertinent to the adequacy of the submitted equipment shall be submitted for review. Shop drawings shall include, but not be limited to the following:
- C. Submit all equipment noted and scheduled on plans including but not limited to the following:
 - Piping, Valves and fittings and specialties for the following systems:
 - Domestic systems
 - Sanitary waste and vent
 - Hangers and Supports.
 - Pipe Insulation
 - Hangers and Inserts
 - Backflow preventers
 - Piping Layout (3/8 scale)
 - Coordinated plumbing plan indicating all other trades in the area of work
- D. The contractor shall, upon award, submit a schedule for the Engineer's review indicating when each of the above shop drawings shall be submitted. Submittals shall be made in a timely manner as the project progresses in accordance with the Construction manager or General contractor's work schedules. The contractor shall allow sufficient time for the engineers to perform his review. A minimum of 10 business days shall be required. Untimely submittals shall be cause for the owner to make a delay against the contractor.
- E. Demolition, purchase and or installation shall not begin until shop drawings pertaining to the equipment associated with any related portion of the work have been submitted.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- E. Coordination shop drawings shall indicate all new lights, walls, piping, ductwork, structural elements, existing work, etc. and dimension locations of plumbing piping including elevations in relation to these items.
- G. Where shop drawings have been reviewed by the Engineer, such review shall not be considered as a guarantee of measurements or building conditions. Where drawings have been reviewed, said review does not mean that drawings have been checked in detail; said review does not substantiate any quantities and in any way relieve the Contractor from his responsibility nor the necessity of furnishing materials or performing work required by the Contract Drawings and Specifications.
- H. Where substitutions are submitted for approval, the review shall be for general performance comparison to the specified product. Products shall not be reviewed for size, clearance or coordination with other trades. Coordination with other trades shall be the responsibility of the contractor. And changes to existing conditions or changes required to the work of other trades such as a result of substituted material or equipment approved or not shall be the responsibility of this contractor.
- J Approval of Shop Drawings:
 - 1. The Contractor shall be specifically responsible for checking equipment dimensions and clearances and confirming that equipment will fit into the designated space and connect properly to adjoining equipment and/or materials.
 - 2. Submittals marked "Make Corrections Noted" give authority to proceed in accordance with the notes. However, if drawings are also marked "Amend and Resubmit", corrected drawings must be resubmitted for final review.
 - 3. Submittals marked "Rejected" do not give authority to proceed with any portion of the work shown there-on. Drawings must be resubmitted.
 - 4. Submittals marked "Rejected" or "Amend and Resubmit" shall include a specific written response to the engineer's comments. Resubmission of a submittal without a written response to the engineer's comments will be considered incomplete and shall be returned un-reviewed.
- K. The contractor shall submit a composite shop drawing layout plan. This shall include all trades including plumbing mechanical and electrical trades. It shall indicate all equipment, piping conduit. It shall include an accurate architectural background. The composite drawing is for contractors and subcontractors to coordinate their work with the work of other trades prior to submitting to the engineer for review and approval. Identify equipment clearances as required for service and maintenance by the manufacture. Indicate conflicts for resolution.
- L. Coordination submittals for piping, conduit and equipment within the building shall be made using 3-D software such as AutoCAD and shall include plan view sections and elevations as necessary to full illustrate and evaluate and resolve all structural, piping, major conduit and equipment for conflicts with other trades.

3.03 CHARTS AND TAGS

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- A. The Contractor shall provide three sets of charts and diagrams of all piping systems indicating the number and location of valves, etc.
- B. All valves shall be designated with brass tags.
- C. Comply with Supplemental and general Conditions

3.04 CODES AND STANDARDS

- A. All equipment and installation methods shall conform to the applicable standards and/or recommendations set forth in but not limited to the following:
 - a. The New York State Building, Plumbing, and Energy Conservation Code
- B. As well as all applicable referenced standards.

3.05 FEES & PERMITS

- A. The Contractor shall obtain all permits and pay all fees required for his work.

3.06 PAINTING

- A. All piping and equipment shall be painted in colors conforming with OSHA Standards.

3.07 RIGGING

- A. Furnish all labor, materials and equipment required to rig equipment and materials.
- B. The rigger shall secure any necessary permits and comply with all applicable Federal, State and local safety regulations. A copy of permits to be kept at both the project site and Engineer's Office.
- C. The rigger shall have a minimum of five (5) years of practical experience and hold a master riggers license if required.
- D. The procedure for rigging shall be submitted to the Engineer for review. All possible precautions should be taken to prevent damage to the structure, streets, sidewalks, curbs, lawns, etc.

3.08 CUTTING AND PATCHING

- A. All cutting and patching required for piping, etc., passing through walls, floors, and roof shall be provided by the General Contractor under this contract unless otherwise noted. This Contractor shall be responsible for any damage done to the structure due to his negligence.
- B. Patching materials and application shall match existing construction. It also includes patch to match any voids left behind by HVAC removals. MC will hire a skilled tradesman (mason, carpenter, etc.) to perform this work.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- C. Where applicable, new holes for piping installation shall be core drilled.
- D. Pipe Sleeves & Fire-stopping
 - 1. Provide for all pipes and other elements passing through floors, walls, partitions and structural elements, sleeves as specified. Sleeves shall be of adequate diameter to allow for a minimum of 3/4 inches clear all around sleeve and pipe.
 - 2. Where pipes penetrate fire rated assemblies, or where holes or voids are created to extend systems through fire rated assemblies (walls, floors, ceilings, structure, etc.); sleeves and fire-stopping systems shall be installed.

3.09 PROTECTION-COORDINATE WITH DIVISION 01

- A. Recommendations and Provisions of ANSI Bulletin A10.2 and OSHA shall be complied with in-so-far as applicable to the work.
- C. The Contractor shall provide temporary partitions or tarpaulins to protect adjacent spaces and/or equipment. He shall be responsible for any damage or injury to person or property of any character resulting from any act, omission, neglect or misconduct in his manner or method of executing his work.
- D. The Contractor shall restore at his own expense such property to a condition similar or equal to that existing before such damage or injury in an acceptable manner.
- E. The Contractor, furthermore, shall conduct his operations in such a manner as to prevent dust and debris from transferring on to adjoining property or into existing spaces.
- F. All openings cut in walls, floors, roof or ceilings of the building, for pipe, etc., shall be closed off with box-type temporary protective enclosures of 1/4" tempered hardboard, except when mechanics are actually working at the particular opening. Enclosures shall be constructed of fireproof 2x4 frame, four (4) sides covered and made completely dust and watertight.
- F. All finished floor areas through which the contractor must pass with materials or equipment shall be protected with a layer of 1/4" hardboard, "Masonite", laid with joints taped together. Roofs shall be protected with 1/2" plywood.

3.10 EQUIPMENT SUPPORTS

- A. Provide supplementary steel dunnage, curbs, angle iron stands, etc., to properly set and install all equipment, including supports necessary to properly pitch piping.

3.11 WELDING

- A. Welding and equipment shall conform to the American Welding Society's Code for Welding in Building Construction, latest edition as well as state and local laws and ordinances.
- B. The handling and storage of all welding materials, acetylene and oxygen tanks, burners, and other equipment required for the execution of welding and cutting work shall be

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

subject at all times to the approval of the Owner and/or Architect. All welding materials and gas tanks shall be promptly removed from the premises upon completion of each day's work or stored in a manner satisfactory to the owner. Welding and equipment shall conform to the American Welding Society's Code for Welding in Building Construction, latest edition as well as state and local laws and ordinances.

- C. Provide all temporary ventilation, and ventilation air systems required during welding operations as required by OSHA.

3.12 AS-BUILT DRAWINGS

- A. The Contractor shall provide a complete set of As-Built drawings showing actual installation and locations of all piping and roof drains.
- B. As-Built drawings shall be submitted as per contract requirements in accordance with Division 1.

3.13 CONDITIONS

- A. Inspection: Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence. Verify that the work of this Section may be completed in strict accordance with all pertinent codes and regulations, the approved Shop Drawings, and the Manufacturers' recommendations.
- C. Discrepancies: In the event of discrepancy, immediately notify the Engineer. Do not proceed in areas of discrepancy until all such discrepancies have been fully resolved.

3.14 INSTALLATION OF EQUIPMENT

- A. Locations: Install all equipment in the locations shown on the approved Shop Drawings except where specifically otherwise approved on the job by the Owner and/or Engineer.
- B. Interferences: Avoid interference with structure, and with work of other trades, preserving adequate headroom and clearing all doors and passageways to the approval of the Engineer.
- C. Inspection: Check each piece of equipment in the system for defects, verifying that all parts are properly furnished and installed, and that all items function properly, and that all adjustments have been made.

3.15 CLOSING-IN OF UNINSPECTED WORK

- A. General: Do not allow or cause any of the work to be covered up or enclosed until it has been inspected, tested, and accepted by the Engineer and by all other authorities having jurisdiction.
- B. Uncovering: Should any of the work of this Section be covered up or enclosed before it has been completely inspected, tested, and approved, do all things necessary to uncover all such work. After the work has been completely inspected, tested, and approved,

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

provide all materials and labor necessary and make all repairs necessary to restore the work to its original and proper condition at no additional cost to the owner.

3.16 BUILDING ACCESS

- A. The Contractor shall inform himself fully regarding peculiarities and limitations of space available for the passage and installation of all equipment and materials under the Contract.
- B. Verify and coordinate removal of existing construction to suit conditions. Provide all labor and material to facilitate installation.

3.17 COOPERATION WITH OTHER TRADES / PHASING

- A. Cooperate with other trades in order that all systems in the work may be installed in the best arrangements.
- B. Coordinate as required with all other trades to share space in common areas and to provide the maximum of access to each system.
- C. This Contractor shall submit fully coordinated shop drawings showing all piping, ductwork and equipment, as well as relevant work of all other trades such as light, conduits, structural and steel, which may impact the final size or placement of piping, roof drains, etc.
- D. The work shall be scheduled and phased in accordance with the requirements of the contract and the client. Prior to the commencement of work the contractor shall submit a schedule in writing to the Architect and Owner for approval. There shall be no shutdowns of any systems without prior written approval from the Owner. The contractor shall include in his bid all costs associated with providing temporarily piping, pumps, hot water heaters, to maintain operations outside the area of work while work is being performed. It shall also be noted that piping will have to be extended through the other areas to reach the area(s) under construction as part of this work. The contractor shall include in his bid all provisions to perform such phasing work. This note is typical for phases.

3.18 CLEANING

- A. It is the intent of the Contract Documents that all work, including the inside of equipment be left in a clean condition. All construction dirt shall be removed from material and equipment.
- B. All removed items shall be taken off the premises and discarded in a manner satisfactory to the Owner.

3.19 COMPLETENESS

- A. It is the intent of the contract documents to provide complete systems. Completeness shall mean not only that all material and equipment has been installed properly, but that all material and equipment is installed, adjusted, and operating as per the design intent in the opinion of the Engineer.

3.20 FIRE PREVENTION DURING HOT WORK

- B. Before starting operations, the Contractor shall furnish trained personnel to provide fire watches for locations where hot work is to be performed. One fire watcher may observe several locations in a relatively small contiguous area. Contractor shall furnish suitable type, fully charged, operable portable fire extinguisher to each fire watcher.
- C. The Contractor shall provide fire watchers who know how to operate the fire extinguisher, how to turn on a fire alarm and how to summon the fire department.
- D. Before starting operations, take suitable precautions to minimize the hazard of a fire communicating to the opposite side of walls, floors, ceilings and roofs from the operations.

3.21 SAFETY MEASURES

- A. Hot work shall not be done in or near rooms or areas where flammable liquids or explosive vapors are present or thought to be present. A combustible gas indicator (explosimeter) test shall be conducted to assure that each area is safe. The Contractor is responsible for arranging and paying for each test.
- B. Insofar as possible, the Contractor shall remove and keep the area free from all combustibles, including rubbish, paper and waste within a radius of 25 feet from hot operations.
- C. If combustible material cannot be removed, the Contractor shall furnish fireproof blankets to cover such materials. At the direction of the owner floors, walls, and ceilings of combustible material shall be wetted thoroughly with water before, during, and after operations sufficiently to afford adequate protection.
- D. Where possible, the Contractor shall furnish and use baffles of metal or gypsum board to prevent the spraying of sparks, hot slag and other hot particles into surrounding combustible material.
- E. The Contractor shall prevent the spread of sparks and particles of hot metal through open windows, doors, and holes and cracks in floors, walls, ceilings and roofs.
- F. Cylinders of gas used in hot work shall be placed a safe distance from the work. The Contractor shall provide hoses and equipment free of deterioration, malfunction and leaks. Suitable supports shall be provided to prevent accidental overturning of cylinders. All cylinder control valves shall be shut off while in use with the gas pressure regulator set at 15 psi or less.
- G. When hot work operations are completed or ended for the day, each location of the day's work shall be inspected by the Contractor 30 to 60 minutes after completion of operations to detect for hidden or smoldering fires and to ensure that proper housekeeping is maintained. Contractor shall cleanup the area of work at the end of each shift or workday.
- H. Where sprinkler protection exists, the sprinkler system shall be maintained without interruption while operations are being performed. If operations are performed close to automatic sprinkler

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

heads, gypsum board sheets or damp cloth guards may be used to shield the individual heads temporarily. The heads shall be inspected by the Contractor immediately after hot work operations cease, to ensure all materials have been removed from the heads and that the heads have not been damaged.

- I. Suitable type, fully charged, operable portable fire extinguisher shall be available at all times during hot work operations.
- J. If any of the above safeguards are not employed, or are violated, the Contracting owners Representative may, by written notice, stop the work until compliance is obtained. Such stoppage shall not relieve the Contractor from performing his work within the Contract period for the Contract price.

3.22 USE OF OWNERS EQUIPMENT

- A. The contractor shall not use any the owner's HVAC system or equipment, new or existing, for any purpose. The contractor shall provide temporary HVAC equipment, ductwork, power, and controls for use during construction for the purpose of ventilation, or heating during the construction process. All such equipment, ductwork, power, and controls shall be removed and the completion of work.

3.23 CLOSEOUT PROCEDURES

- A. General Operating and Maintenance Instructions: Arrange for each installer of operating equipment and other work that requires regular or continuing maintenance, to meet at the site with the Owner's personnel to provide necessary basic instructions in the proper operation and maintenance of the entire Work. Where installers are not expert in the required procedures, include instruction by the manufacturer's representatives.
- B. Where applicable, provide instruction and training, including application of special coatings systems, at manufacturer's recommendation.
- C. Provide a detailed review of the following items:
 - 1. Maintenance manuals
 - 2. Record documents and catalog cuts for each piece of equipment.
 - 3. Spare parts and materials
 - 4. Tools
 - 5. Lubricants
 - 6. Fuels
 - 7. Identification systems
 - 8. Control sequences
 - 9. Hazards
 - 10. Cleaning
- D. Warranties, bonds, maintenance agreements, and similar continuing commitments.
- E. Demonstrate the following procedures:
 - 1. Start-up
 - 2. Shut down

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

3. Emergency operations
 4. Noise and vibration adjustments
 5. Safety procedures
 6. Economy and efficiency adjustments
 7. Periodic maintenance
- F. Prepare instruction periods to consisting classroom instruction and or "hands-on" instruction for all equipment including the following.
1. Fuel oil systems. Leak level and alarms, fuel pumps and fuel treatment.
 2. Gas fired equipment, hot water heaters, recirculation pump, and mixing valves.
 3. Domestic water systems including backflow testing requirements
- G. Prepare a written agenda for each session and submit for review and approval. Include date, location, purpose, specific scope, proposed attendance, and session duration.
- H. Record training sessions in digital format, format as selected by the Owner. Turn over digital files to the Owner after training has been completed.

END OF SECTION

SECTION 22 05 17

SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUSTAINABLE DESIGN OBJECTIVES

- A. Westchester County requires the Contractor to implement practices and procedures to meet the project's environmental performance goals, which include:
 - 1. Minimize the environmental impacts of the construction and operation of the project during the construction phase. The project shall implement the following procedures singly or in combination:
 - a. Select products that minimize consumption of non-renewable resources, consume reduced amounts of energy, minimize environmental pollution, and to utilize recycled and/or recyclable materials.
 - b. Reduce sources of potential Indoor Air Quality pollutants by controlled selection of materials and processes used in project construction. (015721)
 - c. Minimize waste produced by construction through efficient construction practices and landfill diversion, as detailed in the Construction Waste Management Plan. (017419)
 - 2. Products and processes that achieve the above objectives have been selected and included in the Construction Documents.

1.3 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Stack-sleeve fittings.
 - 3. Sleeve-seal systems.
 - 4. Sleeve-seal fittings.
 - 5. Grout.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Comply with the requirements of the Construction Staging and Waste Management Plan.

1.7 PROJECT CONDITIONS

- A. Waste Management: Comply with the requirements of the Construction Waste Management Plan.

PART 2 - PRODUCTS

2.1 PRODUCT REQUIREMENTS FOR SUSTAINABLE DESIGN – GENERAL

- A. All field applied paints, coatings, sealants, sealer, adhesives in this section shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. All Products in this Section shall be free of Materials of Concern as noted in 015721-Indoor Air Quality Control (where achievable).

2.2 SLEEVES

- A. Cast-Iron Wall Pipe Sleeves: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
- B. Galvanized-Steel Wall Pipes: ASTM A53/A53M, Schedule 80, with plain ends and welded steel collar, zinc coated.
- C. Galvanized-Steel-Pipe Sleeves: ASTM A53/A53M, Type E, Grade B, Schedule 80, zinc coated with plain ends.
- D. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

2.3 STACK-SLEEVE FITTINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Jay R. Smith Mfg Co; a division of Morris Group International.
 - 2. Wade; a subsidiary of McWane Inc.
 - 3. Zurn Industries, LLC.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- B. Description: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring, bolts, and nuts for membrane flashing.

- 1. Underdeck Clamp: Clamping ring with setscrews.

2.4 SLEEVE-SEAL SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- 1. Advance Products & Systems, LLC.
 - 2. CALPICO, Inc.
 - 3. GPT; an EnPro Industries company.
 - 4. Metraflex Company (The).

- B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.

- 1. Designed to form a hydrostatic seal of 20 psig minimum.
 - 2. Sealing Elements: EPDM-rubber or Nitrile (Buna N) interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 - 3. Pressure Plates: Carbon steel, Stainless steel or Stainless steel, Type 316.
 - 4. Connecting Bolts and Nuts: Carbon steel, with ASTM B633 coating, Stainless steel or Stainless steel, Type 316 of length required to secure pressure plates to sealing elements.

2.5 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall.

- B. Rubber waterstop collar with center opening to match piping OD.

2.6 GROUT

- A. Description: Nonshrink, for interior and exterior sealing openings in non-fire-rated walls or floors.

- B. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

- C. Design Mix: 5000 psi, 28-day compressive strength.

- D. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 INSTALLATION OF SLEEVES

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
 - 1. Sleeves are not required for core-drilled holes.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
 - 2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
- D. Install sleeves for pipes passing through interior partitions.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Division 07 Section "Joint Sealants".
- E. Fire-Resistance-Rated Penetrations, Horizontal Assembly Penetrations, and Smoke Barrier Penetrations: Maintain indicated fire or smoke rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with UL Listed/FM Approved fire- and smoke-stop materials. Comply with requirements for firestopping and fill materials specified in Division 07 "Penetration Firestopping."

3.2 INSTALLATION OF STACK-SLEEVE FITTINGS

- A. Install stack-sleeve fittings in new slabs as slabs are constructed.
 - 1. Install fittings that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 2. Secure flashing between clamping flanges for pipes penetrating floors with membrane waterproofing. Comply with requirements for flashing specified in Division 07 Section "Sheet Metal Flashing and Trim."
 - 3. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.
 - 4. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

5. Using waterproof grout, seal space between top hub of stack-sleeve fitting and pipe.

- B. Fire-Resistance-Rated Penetrations, Horizontal Assembly Penetrations, and Smoke Barrier Penetrations: Maintain indicated fire or smoke rating of floors at pipe penetrations. Seal pipe penetrations with fire- and smoke-stop materials. Comply with requirements for firestopping specified in Division 07 Section "Penetration Firestopping."

3.3 INSTALLATION OF SLEEVE-SEAL SYSTEMS

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building and passing through exterior walls.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.4 INSTALLATION OF SLEEVE-SEAL-FITTINGS

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Use grout to seal the space around outside of sleeve-seal fittings.

3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
1. Leak Test: After allowing for a full cure, test sleeves and sleeve seals for leaks. Repair leaks and retest until no leaks exist.
 2. Sleeves and sleeve seals will be considered defective if they do not pass tests and inspections.
- B. Prepare test and inspection reports.

3.6 SLEEVE SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
1. Exterior Concrete Walls above Grade:
 - a. Piping Smaller Than NPS 6: Steel pipe sleeves Sleeve-seal fittings.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- b. Piping NPS 6 and Larger: Cast-iron pipe sleeves, or Steel pipe sleeves with Sleeve-seal fittings.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
- 2. Exterior Concrete Walls below Grade
 - a. Piping Smaller Than NPS 6: Steel pipe sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch minimum annular clear space between piping and sleeve for installing sleeve-seal system.
 - b. Piping NPS 6 and Larger: Cast-iron pipe sleeves with sleeve-seal system or Steel pipe sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch minimum annular clear space between piping and sleeve for installing sleeve-seal system.
- 3. Concrete Slabs-on-Grade:
 - a. Piping Smaller Than NPS 6: Steel pipe sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch minimum annular clear space between piping and sleeve for installing sleeve-seal system.
 - b. Piping NPS 6 and Larger: Cast-iron pipe sleeves with sleeve-seal system or Steel pipe sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch minimum annular clear space between piping and sleeve for installing sleeve-seal system.
- 4. Concrete Slabs above Grade:
 - a. Piping Smaller Than NPS 6: Steel pipe sleeves or Stack-sleeve fittings.
 - b. Piping NPS 6 and Larger: Steel pipe sleeves or Stack-sleeve fittings.
- 5. Interior Partitions:
 - a. Piping Smaller Than NPS 6: Steel pipe sleeves.
 - b. Piping NPS 6 and Larger: Galvanized-steel sheet sleeves.

END OF SECTION

SECTION 22 05 18

ESCUTCHEONS FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.
 - 2. Floor plates.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

PART 2 - PRODUCTS

2.1 ESCUTCHEONS

- A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished, chrome-plated finish and spring-clip fasteners.
- C. One-Piece, Stamped-Steel Type: With polished, chrome-plated finish and spring-clip fasteners.
- D. Split-Plate, Stamped-Steel Type: With polished, chrome-plated finish; concealed hinge; and spring-clip fasteners.

2.2 FLOOR PLATES

- A. Split Floor Plates: Cast brass with concealed hinge.
- B. One-piece Floor Plates: Cast-iron flange with holes for fasteners.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of insulated piping and with OD that completely covers opening.
 - 1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep pattern.
 - b. Chrome-Plated Piping: One-piece cast brass or split-casting brass with polished, chrome-plated finish.
 - c. Insulated Piping: One-piece stamped steel or split-plate, stamped steel with concealed hinge with polished, chrome-plated finish.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece cast brass with polished, chrome-plated finish.
 - e. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece cast brass or split-casting brass with polished, chrome-plated finish.
 - f. Bare Piping in Unfinished Service Spaces: One-piece stamped steel or split-plate, stamped steel with concealed hinge with polished, chrome-plated finish.
 - g. Bare Piping in Equipment Rooms: One-piece stamped steel or split-plate, stamped steel with concealed hinge with polished, chrome-plated finish.
- C. Install floor plates for piping penetrations of equipment-room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 - 1. New Piping: One-piece, floor plate.
 - 2. Existing Piping: Split floor plate.

3.2 FIELD QUALITY CONTROL

- A. Using new materials, replace broken and damaged escutcheons and floor plates.

END OF SECTION

SECTION 22 05 19

METERS AND GAGES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Bimetallic-actuated thermometers.
2. Liquid-in-glass thermometers.
3. Thermowells.
4. Pressure gages.
5. Gage attachments.
6. Test plugs.
7. Test-plug kits.
8. Sight flow indicators.

B. Related Requirements:

1. Section 221119 "Domestic Water Piping Specialties" for water meters.
2. Section 331415 "Site Water Distribution Piping" for domestic water meters and combined domestic and fire-protection water-service meters outside the building.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of meter and gage.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For meters and gages to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 BIMETALLIC-ACTUATED THERMOMETERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Trerice, H. O. Co.
 2. Watts Water Technologies; a Watts company.
 3. Weiss Instruments, Inc.
 4. Weksler Glass Thermometer Corp.
- B. Standard: ASME B40.200.
- C. Case: Liquid-filled and sealed type(s); stainless steel with 5-inch nominal diameter.
- D. Dial: Nonreflective aluminum with permanently etched scale markings and scales in deg F and deg C.
- E. Connector Type(s): Union joint, adjustable angle, with unified-inch screw threads.
- F. Connector Size: 1/2 inch, with ASME B1.1 screw threads.
- G. Stem: 0.25 or 0.375 inch in diameter; stainless steel.
- H. Window: Plain glass.
- I. Ring: Stainless steel.
- J. Element: Bimetal coil.
- K. Pointer: Dark-colored metal.
- L. Accuracy: Plus or minus 1 percent of scale range.

2.2 LIQUID-IN-GLASS THERMOMETERS

- A. Metal-Case, Compact-Style, Liquid-in-Glass Thermometers:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Trerice, H. O. Co.
 2. Standard: ASME B40.200.
 3. Case: Cast aluminum; 6-inch nominal size.
 4. Case Form: Back angle unless otherwise indicated.
 5. Tube: Glass with magnifying lens and blue or red organic liquid.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

6. Tube Background: Nonreflective aluminum with permanently etched scale markings graduated in deg F and deg C.
7. Window: Glass or plastic.
8. Stem: Aluminum or brass and of length to suit installation.
 - a. Design for Thermowell Installation: Bare stem.
9. Connector: 3/4 inch, with ASME B1.1 screw threads.
10. Accuracy: Plus or minus 1 percent of scale range or one scale division, to a maximum of 1.5 percent of scale range.

B. Metal-Case, Industrial-Style, Liquid-in-Glass Thermometers:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Terice, H. O. Co.
 - b. Weiss Instruments, Inc.
 - c. Weksler Glass Thermometer Corp.
2. Standard: ASME B40.200.
3. Case: Cast aluminum; 9-inch nominal size unless otherwise indicated.
4. Case Form: Adjustable angle unless otherwise indicated.
5. Tube: Glass with magnifying lens and blue[**or red**] organic liquid.
6. Tube Background: Nonreflective aluminum with permanently etched scale markings graduated in deg F and deg C.
7. Window: Glass.
8. Stem: Aluminum and of length to suit installation.
 - a. Design for Thermowell Installation: Bare stem.
9. Connector: 1-1/4 inches, with ASME B1.1 screw threads.
10. Accuracy: Plus or minus 1 percent of scale range or one scale division, to a maximum of 1.5 percent of scale range.

2.3 THERMOWELLS

A. Thermowells:

1. Standard: ASME B40.200.
2. Description: Pressure-tight, socket-type fitting made for insertion into piping tee fitting.
3. Material for Use with Copper Tubing: CNR or CUNI.
4. Material for Use with Steel Piping: CRES CSA.
5. Type: Stepped shank unless straight or tapered shank is indicated.
6. External Threads: NPS 1/2, NPS 3/4, or NPS 1, ASME B1.20.1 pipe threads.
7. Internal Threads: 1/2, 3/4, and 1 inch, with ASME B1.1 screw threads.
8. Bore: Diameter required to match thermometer bulb or stem.
9. Insertion Length: Length required to match thermometer bulb or stem.
10. Lagging Extension: Include on thermowells for insulated piping and tubing.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

11. Bushings: For converting size of thermowell's internal screw thread to size of thermometer connection.

B. Heat-Transfer Medium: Mixture of graphite and glycerin.

2.4 PRESSURE GAGES

A. Direct-Mounted, Metal-Case, Dial-Type Pressure Gages:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Ametek U.S. Gauge.
- b. Watts Water Technologies; a Watts company.
- c. Weiss Instruments, Inc.
- d. Weksler Glass Thermometer Corp.

2. Standard: ASME B40.100.

3. Case: Liquid-filled and Sealed Solid-front, pressure relief type(s); cast aluminum or drawn steel; 6-inch nominal diameter.

4. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.

5. Pressure Connection: Brass, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.

6. Movement: Mechanical, with link to pressure element and connection to pointer.

7. Dial: Nonreflective aluminum with permanently etched scale markings graduated in psi.

8. Pointer: Dark-colored metal.

9. Window: Glass.

10. Ring: Brass or Stainless steel.

11. Accuracy: Grade A, plus or minus 1 percent of middle half of scale range.

B. Remote-Mounted, Metal-Case, Dial-Type Pressure Gages:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Ametek U.S. Gauge.
- b. Trerice, H. O. Co.
- c. Watts Water Technologies; a Watts company.
- d. Weiss Instruments, Inc.

2. Standard: ASME B40.100.

3. Case: Liquid-filled and Sealed type; cast aluminum or drawn steel; 4-1/2-inch or 6-inch nominal diameter with back or front flange and holes for panel mounting.

4. Pressure-Element Assembly: Bourdon tube unless otherwise indicated.

5. Pressure Connection: Brass, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and bottom-outlet type unless back-outlet type is indicated.

6. Movement: Mechanical, with link to pressure element and connection to pointer.

7. Dial: Nonreflective aluminum with permanently etched scale markings graduated in psi.

8. Pointer: Dark-colored metal.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

9. Window: Glass.
10. Ring: Stainless steel.
11. Accuracy: Grade A, plus or minus 1 percent of middle half of scale range.

2.5 GAGE ATTACHMENTS

- A. Snubbers: ASME B40.100, brass; with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads and piston-type surge-dampening device. Include extension for use on insulated piping.
- B. Valves: Brass or stainless steel needle, with NPS 1/4 or NPS 1/2, ASME B1.20.1 pipe threads.

2.6 TEST PLUGS

- A. Description: Test-station fitting made for insertion into piping tee fitting.
- B. Body: Brass or stainless steel with core inserts and gasketed and threaded cap. Include extended stem on units to be installed in insulated piping.
- C. Thread Size: NPS 1/2, ASME B1.20.1 pipe thread.
- D. Minimum Pressure and Temperature Rating: 500 psig at 200 deg F.
- E. Core Inserts: Chlorosulfonated polyethylene synthetic and EPDM self-sealing rubber.

2.7 TEST-PLUG KITS

- A. Furnish one test-plug kit containing one thermometer, one pressure gage and adapter, and carrying case. Thermometer sensing elements, pressure gage, and adapter probes shall be of diameter to fit test plugs and of length to project into piping.
- B. Low-Range Thermometer: Small, bimetallic insertion type with 1- to 2-inch- diameter dial and tapered-end sensing element. Dial range shall be at least 25 to 125 deg F.
- C. High-Range Thermometer: Small, bimetallic insertion type with 1- to 2-inch- diameter dial and tapered-end sensing element. Dial range shall be at least 0 to 220 deg F.
- D. Pressure Gage: Small, Bourdon-tube insertion type with 2- to 3-inch- diameter dial and probe. Dial range shall be at least 0 to 200 psig.
- E. Carrying Case: Metal or plastic, with formed instrument padding.

2.8 SIGHT FLOW INDICATORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 1. ARCHON Industries, Inc.
 2. Dwyer Instruments, Inc.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

3. Ernst Flow Industries.
 4. John C. Ernst Co., Inc.
- B. Description: Piping inline-installation device for visual verification of flow.
- C. Construction: Bronze or stainless-steel body, with sight glass and ball, flapper, or paddle wheel indicator, and threaded or flanged ends.
- D. Minimum Pressure Rating: 150 psig.
- E. Minimum Temperature Rating: 200 deg F.
- F. End Connections for NPS 2 and Smaller: Threaded.
- G. End Connections for NPS 2-1/2 and Larger: Flanged.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install thermowells with socket extending one-third of pipe diameter to center of pipe and in vertical position in piping tees.
- B. Install thermowells of sizes required to match thermometer connectors. Include bushings if required to match sizes.
- C. Install thermowells with extension on insulated piping.
- D. Fill thermowells with heat-transfer medium.
- E. Install direct-mounted thermometers in thermowells and adjust vertical and tilted positions.
- F. Install remote-mounted thermometer bulbs in thermowells and install cases on panels; connect cases with tubing and support tubing to prevent kinks. Use minimum tubing length.
- G. Install direct-mounted pressure gages in piping tees with pressure gage located on pipe at the most readable position.
- H. Install remote-mounted pressure gages on panel.
- I. Install valve and snubber in piping for each pressure gage for fluids.
- J. Install test plugs in piping tees.
- K. Install thermometers in the following locations:
 1. Inlet and outlet of each water heater.
 2. Inlets and outlets of each domestic water heat exchanger.
 3. Inlet and outlet of each domestic hot-water storage tank.
 4. Inlet and outlet of each remote domestic water chiller.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- L. Install pressure gages in the following locations:
 - 1. Building water service entrance into building.
 - 2. Inlet and outlet of each pressure-reducing valve.
 - 3. Suction and discharge of each domestic water pump.

3.2 CONNECTIONS

- A. Install meters and gages adjacent to machines and equipment to allow service and maintenance of meters, gages, machines, and equipment.

3.3 ADJUSTING

- A. Adjust faces of meters and gages to proper angle for best visibility.

3.4 PRESSURE GAGE AND THERMOMETER SCHEDULE

- A. Install large size thermometers wherever space is available. Where space is limited use compact style.
- B. Install all pressure gages locally unless space does not permit, or the location is not readily visible. Then use remote reading pressure gage and install in location accessible and readily visible, as close to the point of reading as possible.
 - 1. Test plug with EPDM self-sealing rubber inserts.
- C. Install pressure gages upstream and downstream of backflow preventers.
- D. Thermometer stems shall be of length to match thermowell insertion length.

3.5 THERMOMETER SCALE-RANGE SCHEDULE

- A. Scale Range for Domestic Cold-Water Piping:
 - 1. 0 to 100 deg F.

3.6 PRESSURE-GAGE SCALE-RANGE SCHEDULE

- A. Scale Range for Water Service Piping:
 - 1. 0 to 200 psi.
- B. Scale Range for Domestic Water Piping:
 - 1. 0 to 160 psi.

END OF SECTION

SECTION 22 05 23

GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Brass ball valves.
 - 2. Bronze lift check valves.
 - 3. Bronze swing check valves.
 - 4. Bronze gate valves.
 - 5. Iron gate valves.
 - 6. Bronze globe valves.
 - 7. Iron globe valves.
- B. Related Sections:
 - 1. Division 22 Section 220553 "Identification for Plumbing Piping and Equipment" for valve tags and schedules.
 - 2. Division 33 water distribution piping Sections for general-duty and specialty valves for site construction piping.

1.3 DEFINITIONS

- A. CWP: Cold working pressure.
- B. EPDM: Ethylene propylene copolymer rubber.
- C. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
- D. NRS: Non-rising stem.
- E. OS&Y: Outside screw and yoke.
- F. RS: Rising stem.

1.4 SUBMITTALS

- A. Product Data: For each type of valve indicated.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1.5 QUALITY ASSURANCE

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 2. ASME B31.1 for power piping valves.
 - 3. ASME B31.9 for building services piping valves.
- C. NSF Compliance: NSF 61 for valve materials for potable-water service.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
 - 1. Protect internal parts against rust and corrosion.
 - 2. Protect threads, flange faces, grooves, and weld ends.
 - 3. Set gate valves closed to prevent rattling.
 - 4. Set ball valves open to minimize exposure of functional surfaces.
 - 5. Set butterfly valves closed or slightly open.
 - 6. Block check valves in either closed or open position.
- B. Use the following precautions during storage:
 - 1. Maintain valve end protection.
 - 2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Refer to valve schedule articles for applications of valves.
- B. Valve Pressure and Temperature Ratings: Not less than indicated or as required for system pressures and temperatures.
- C. Valve Sizes: Same as upstream piping unless otherwise indicated.
- D. Valve Actuator Types:
 - 1. Handwheel: For valves other than quarter-turn types.
 - 2. Handlever: For quarter-turn valves NPS 6 and smaller.
- E. Valves in Insulated Piping: With 2-inch stem extensions and the following features:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Gate Valves: With rising stem.
2. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.
3. Butterfly Valves: With extended neck.

F. Valve-End Connections:

1. Flanged: With flanges according to ASME B16.1 for iron valves.
2. Grooved: With grooves according to AWWA C606.
3. Solder Joint: With sockets according to ASME B16.18.
4. Threaded: With threads according to ASME B1.20.1.

G. Valve Bypass and Drain Connections: MSS SP-45.

H. All materials shall comply with NSF/ANSI Standard 732 for lead free.

I. Pressure reducing valves shall conform to ASSE 1003 or CSA B356. The valves shall have integral or separate strainer. The valve shall be designed to fail open.

2.2 BRASS BALL VALVES

A. Two-Piece, Full-Port, Brass Ball Valves with Brass Trim:

1. Description:
 - a. Standard: MSS SP-110.
 - b. SWP Rating: 150 psig.
 - c. CWP Rating: 600 psig.
 - d. Body Design: Two piece.
 - e. Body Material: Forged brass.
 - f. Seats: PTFE or TFE.
 - g. Stem: Brass.
 - h. Ball: Chrome-plated brass.
 - i. Port: Full.

B. Two-Piece, Regular-Port, Brass Ball Valves with Brass Trim:

1. Description:
 - a. Standard: MSS SP-110.
 - b. SWP Rating: 150 psig.
 - c. CWP Rating: 600 psig.
 - d. Body Design: Two piece.
 - e. Body Material: Forged brass.
 - f. Seats: PTFE or TFE.
 - g. Stem: Brass.
 - h. Ball: Chrome-plated brass.
 - i. Port: Regular.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

2.3 BRONZE LIFT CHECK VALVES

A. Class 125, Lift Check Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Crane Co.; Crane Valve Group; Crane Valves.
 - b. Crane Co.; Crane Valve Group; Jenkins Valves.
 - c. Crane Co.; Crane Valve Group; Stockham Division.
2. Description:
 - a. Standard: MSS SP-80, Type 2.
 - b. CWP Rating: 200 psig.
 - c. Body Design: Vertical flow.
 - d. Body Material: ASTM B 61 or ASTM B 62, bronze.
 - e. Disc: Bronze.

2.4 BRONZE SWING CHECK VALVES

A. Class 125, Bronze Swing Check Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Crane Co.; Crane Valve Group; Crane Valves.
 - b. Crane Co.; Crane Valve Group; Jenkins Valves.
 - c. Crane Co.; Crane Valve Group; Stockham Division.
 - d. Milwaukee Valve Company.
 - e. NIBCO INC.
 - f. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
2. Description:
 - a. Standard: MSS SP-80, Type 3.
 - b. CWP Rating: 200 psig.
 - c. Body Design: Horizontal flow.
 - d. Body Material: ASTM B 62, bronze.
 - e. Disc: Bronze.

2.5 BRONZE GATE VALVES

A. Class 125, NRS Bronze Gate Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- a. Crane Co.; Crane Valve Group; Crane Valves.
- b. Crane Co.; Crane Valve Group; Jenkins Valves.
- c. Crane Co.; Crane Valve Group; Stockham Division.
- d. Milwaukee Valve Company.
- e. NIBCO INC.
- f. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Description:

- a. Standard: MSS SP-80, Type 1.
- b. CWP Rating: 200 psig.
- c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
- d. Ends: Threaded or solder joint.
- e. Stem: Bronze.
- f. Disc: Solid wedge; bronze.
- g. Packing: Asbestos free.
- h. Handwheel: Malleable iron, bronze, or aluminum.

B. Class 125, NRS Bronze Gate Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Crane Co.; Crane Valve Group; Crane Valves.
- b. Crane Co.; Crane Valve Group; Jenkins Valves.
- c. Crane Co.; Crane Valve Group; Stockham Division.
- d. Hammond Valve.
- e. Milwaukee Valve Company.
- f. NIBCO INC.
- g. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Description:

- a. Standard: MSS SP-80, Type 2.
- b. CWP Rating: 300 psig.
- c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
- d. Ends: Threaded or solder joint
- e. Stem: Bronze.
- f. Disc: Solid wedge; bronze.
- g. Packing: Asbestos free.
- h. Handwheel: Malleable iron, bronze, or aluminum.

2.6 IRON GATE VALVES

A. Class 150, OS&Y, Iron Gate Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- a. Crane Co.; Crane Valve Group; Crane Valves.
- b. Crane Co.; Crane Valve Group; Jenkins Valves.
- c. Crane Co.; Crane Valve Group; Stockham Division.
- d. Milwaukee Valve Company.
- e. NIBCO INC.
- f. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Description:

- a. Standard: MSS SP-70, Type I.
- b. CWP Rating: 200 psig.
- c. Body Material: ASTM A 126, gray iron with bolted bonnet.
- d. Ends: Flanged.
- e. Trim: Bronze.
- f. Disc: Solid wedge.
- g. Packing and Gasket: Asbestos free.

B. Class 250, OS&Y, Iron Gate Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Crane Co.; Crane Valve Group; Crane Valves.
- b. Crane Co.; Crane Valve Group; Stockham Division.
- c. Milwaukee Valve Company.
- d. NIBCO INC.
- e. Watts Regulator Co.; a division of Watts Water Technologies, Inc.

2. Description:

- a. Standard: MSS SP-70, Type I.
- b. CWP Rating: 500 psig.
- c. Body Material: ASTM A 126, gray iron with bolted bonnet.
- d. Ends: Flanged.
- e. Trim: Bronze.
- f. Disc: Solid wedge.
- g. Packing and Gasket: Asbestos free.

2.7 BRONZE GLOBE VALVES

A. Class 125, Bronze Globe Valves with Bronze Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Crane Co.; Crane Valve Group; Crane Valves.
- b. Crane Co.; Crane Valve Group; Stockham Division.
- c. Milwaukee Valve Company.
- d. NIBCO INC.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- e. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
2. Description:
- a. Standard: MSS SP-80, Type 2.
 - b. CWP Rating: 200psig.
 - c. Body Material: ASTM B 62, bronze with integral seat and screw-in bonnet.
 - d. Ends: Threaded or solder joint.
 - e. Stem: Bronze.
 - f. Disc: Bronze, PTFE, or TFE
 - g. Packing: Asbestos free.
 - h. Handwheel: Malleable iron, bronze, or aluminum.

2.8 IRON GLOBE VALVES

A. Class 125, Iron Globe Valves:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. Crane Co.; Crane Valve Group; Crane Valves.
 - b. Crane Co.; Crane Valve Group; Jenkins Valves.
 - c. Crane Co.; Crane Valve Group; Stockham Division.
 - d. Milwaukee Valve Company.
 - e. NIBCO INC.
 - f. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
2. Description:
- a. Standard: MSS SP-85, Type I.
 - b. CWP Rating: 200 psig.
 - c. Body Material: ASTM A 126, gray iron with bolted bonnet.
 - d. Ends: Flanged.
 - e. Trim: Bronze.
 - f. Packing and Gasket: Asbestos free.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.
- E. Install check valves for proper direction of flow and as follows:
 - 1. Swing Check Valves: In horizontal position with hinge, pin level.
 - 2. Lift Check Valves: With stem upright and plumb.
- F. All valves used in any system shall have a pressure class that exceeds the pressure of the system it is installed in.
- G. All valves located at an elevation greater than 8' above the finished floor and over 3" in size shall have chain operators that extend to the floor.
- H. Provide pressure reducing valves for all domestic water services where the static pressure is 80 psi static pressure or greater.

3.3 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valve applications are not indicated on plan, use the following:
 - 1. Shutoff Service: Ball, butterfly, or gate valves.
 - 2. Butterfly Valve Dead-End Service: Single-flange (lug) type.
 - 3. Throttling Service: Globe or ball valves.
 - 4. Pump-Discharge Check Valves:
 - a. NPS 2 and Smaller: Bronze swing check valves with bronze or nonmetallic disc.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- b. NPS 2-1/2 and Larger for Sanitary Waste and Storm Drainage: Iron swing check valves with lever and weight or spring.
- B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.
- C. Select valves, except wafer types, with the following end connections:
 - 1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
 - 2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 3. For Steel Piping, NPS 2 and Smaller: Threaded ends.
 - 4. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 5. For Grooved-End Copper Tubing and Steel Piping: Valve ends may be grooved.

3.5 DOMESTIC, AND COLD-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller:
 - 1. Brass Valves: May be provided with lead free solder-joint ends instead of threaded ends.
 - 2. Ball Valves: Two piece, full port, brass with brass trim. Class 150
 - 3. Bronze Swing Check Valves: Class 150, bronze disc.
 - 4. Bronze Gate Valves: Class 150.
- B. Pipe NPS 2-1/2 and Larger:
 - 1. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
 - 2. Iron, Single-Flange Butterfly Valves: 200 CWP, EPDM, NBR seat, aluminum-bronze disc.
 - 3. Iron, Grooved-End Butterfly Valves: 175 CWP.
 - 4. Iron Gate Valves: Class 150.

END OF SECTION

SECTION 22 05 29

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Metal pipe hangers and supports.
- 2. Trapeze pipe hangers.
- 3. Thermal-hanger shield inserts.
- 4. Fastener systems.
- 5. Pipe stands.
- 6. Pipe positioning systems.

- B. Related Sections:

- 1. Division 21 fire-suppression piping Sections for pipe hangers for fire-suppression piping.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

- B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

- 1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- B. Shop Drawings: Show fabrication and installation details and include calculations and product data for the following:
 - 1. Trapeze pipe hangers.
 - 2. Metal framing systems.
 - 3. Pipe stands.
- C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Detail fabrication and assembly of trapeze hangers.
 - 2. Design Calculations: Calculate requirements for designing trapeze hangers.
- D. Welding certificates.

1.6 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
 - 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
 - 2. Galvanized Metallic Coatings: Pre-galvanized or hot dipped.
 - 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
 - 4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
 - 5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
- B. Copper Pipe Hangers:
 - 1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.
 - 2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-coated steel or stainless steel.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

2.2 TRAPEZE PIPE HANGERS

- A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 THERMAL-HANGER SHIELD INSERTS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. National Pipe Hanger Corporation.
 - 2. Pipe Shields, Inc.; a subsidiary of Piping Technology & Products, Inc.
 - 3. Rilco Manufacturing Co., Inc.
 - 4. Other manufacturers offering equivalent products.
- B. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig minimum compressive strength and vapor barrier.
- C. Insulation-Insert Material for Hot Piping: ASTM C 552, Type II cellular glass with 100-psig or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig minimum compressive strength.
- D. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
- E. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
- F. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

2.4 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.5 PIPE STANDS

- A. General Requirements for Pipe Stands: Shop- or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
- B. Compact Pipe Stand: One-piece plastic unit with integral-rod roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- C. Low-Type, Single-Pipe Stand: One-piece stainless-steel base unit with plastic roller, for roof installation without membrane penetration.
- D. High-Type, Single-Pipe Stand:
 - 1. Description: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
 - 2. Base: Stainless steel.
 - 3. Vertical Members: Two or more cadmium-plated-steel or stainless-steel, continuous-thread rods.
 - 4. Horizontal Member: Cadmium-plated-steel or stainless-steel rod with plastic or stainless-steel, roller-type pipe support.
- E. High-Type, Multiple-Pipe Stand:
 - 1. Description: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
 - 2. Bases: One or more; plastic.
 - 3. Vertical Members: Two or more protective-coated-steel channels.
 - 4. Horizontal Member: Protective-coated-steel channel.
 - 5. Pipe Supports: Galvanized-steel, clevis-type pipe hangers.

2.6 PIPE POSITIONING SYSTEMS

- A. Description: IAPMO PS 42, positioning system of metal brackets, clips, and straps for positioning piping in pipe spaces; for plumbing fixtures in commercial applications.

2.7 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
 - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
 - 2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- D. Fastener System Installation:
 - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- E. Pipe Stand Installation:
 - 1. Pipe Stand: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
- F. Pipe Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture. See Division 22 plumbing fixture Sections for requirements for pipe positioning systems for plumbing fixtures.
- G. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- I. Install lateral bracing with pipe hangers and supports to prevent swaying.
- J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, **NPS 2-1/2** and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- K. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- M. Insulated Piping:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Attach clamps and spacers to piping.
 - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
 - b. NPS 4: 12 inches long and 0.06 inch thick.
 - c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
 - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
 - e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.2 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

3.3 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.4 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Division 09 painting Sections.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.5 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports, and metal trapeze pipe hangers and attachments for general service applications.
- F. Use copper-plated pipe hangers and copper or stainless-steel attachments for copper piping and tubing.
- G. Use padded hangers for piping that is subject to scratching.
- H. Use thermal-hanger shield inserts for insulated piping and tubing.
- I. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F, pipes NPS 4 to NPS 24, requiring up to 4 inches of insulation.
 3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.
 4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.
 5. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
 6. Adjustable, Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.
 7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 8. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 9. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 10. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
 11. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
 12. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
 13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
 14. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
 15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
 16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2 to NPS 36 if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.
 17. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
 18. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes NPS 2-1/2 to NPS 24, from single rod if horizontal movement caused by expansion and contraction might occur.
 19. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
 20. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
 21. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.
- J. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- K. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- L. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction, to attach to top flange of structural shape.
 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 6. C-Clamps (MSS Type 23): For structural shapes.
 7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 8. Side-Beam Clamps (MSS Type 27): For bottom of steel I-beams.
 9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 11. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 12. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 13. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
 14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
 15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- M. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- N. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
 2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
 3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
 4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
 5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
 6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
 7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
 8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
 - a. Horizontal (MSS Type 54): Mounted horizontally.
 - b. Vertical (MSS Type 55): Mounted vertically.
 - c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.
- O. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- P. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
- Q. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION

SECTION 22 05 53

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

1.2 SUMMARY

A. Section Includes:

1. Equipment labels.
2. Warning signs and labels.
3. Warning tape.
4. Pipe labels.
5. Stencils.
6. Valve tags.
7. Warning tags.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment-Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
- D. Valve-numbering scheme.
- E. Valve Schedules: For each piping system. Include in operation and maintenance manuals.

1.4 COORDINATION

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 EQUIPMENT LABELS

A. Metal Labels for Equipment:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Craftmark Pipe Markers.
2. Material and Thickness: Brass, 0.032-inch stainless steel, 0.025-inch aluminum, 0.032-inch anodized aluminum, 0.032-inch minimum thickness, with predrilled or stamped holes for attachment hardware.
3. Letter and Background Color: As indicated for specific application under Part 3.
4. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
5. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances of up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
6. Fasteners: Stainless steel rivets or self-tapping screws.
7. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

B. Plastic Labels for Equipment:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Brady Corporation.
 - b. Craftmark Pipe Markers.
2. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, with predrilled holes for attachment hardware.
3. Letter and Background Color: As indicated for specific application under Part 3.
4. Maximum Temperature: Able to withstand temperatures of up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances of up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Fasteners: Stainless steel rivets or self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.

2.2 WARNING SIGNS AND LABELS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Brady Corporation.
 - 2. Craftmark Pipe Markers.
- B. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, with predrilled holes for attachment hardware.
- C. Letter and Background Color: As indicated for specific application under Part 3.
- D. Maximum Temperature: Able to withstand temperatures of up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances of up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless steel rivets or self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Arc-Flash Warning Signs: Provide arc-flash warning signs in locations and with content in accordance with requirements of OSHA and NFPA 70E, and other applicable codes and standards.
- J. Label Content: Include caution and warning information plus emergency notification instructions.

2.3 WARNING TAPE

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Brady Corporation.
 - 2. Craftmark Pipe Markers.
- B. Material: Vinyl.
- C. Minimum Thickness: 0.005 inch.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- D. Letter, Pattern, and Background Color: As indicated for specific application under Part 3.
- E. Waterproof Adhesive Backing: Suitable for indoor or outdoor use.
- F. Maximum Temperature: 160 deg F.
- G. Minimum Width: 2 inches.

2.4 PIPE LABELS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Brady Corporation.
 - 2. Craftmark Pipe Markers.
- B. General Requirements for Manufactured Pipe Labels: Preprinted, color coded, with lettering indicating service and showing flow direction in accordance with ASME A13.1.
- C. Letter and Background Color: As indicated for specific application under Part 3.
- D. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover circumference of pipe and to attach to pipe without fasteners or adhesive.
- E. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- F. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings. Also include:
 - 1. Pipe size.
 - 2. Flow-Direction Arrows: Include flow-direction arrows on main distribution piping. Arrows may be either integral with label or applied separately.
 - 3. Lettering Size: Size letters in accordance with ASME A13.1 for piping At least 1/2 inch for viewing distances of up to 72 inches and proportionately larger lettering for greater viewing distances.

2.5 STENCILS

- A. Stencils for Piping:
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Craftmark Pipe Markers.
 - 2. Lettering Size: Size letters in accordance with ASME A13.1 for piping At least 1/2 inch for viewing distances of up to 72 inches and proportionately larger lettering for greater viewing distances.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

3. Stencil Material: Aluminum, brass, or fiberboard.
4. Stencil Paint: Exterior, gloss, acrylic enamel in colors complying with recommendations in ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.
5. Identification Paint: Exterior, acrylic enamel in colors in accordance with ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.
6. Letter and Background Color: As indicated for specific application under Part 3.

2.6 VALVE TAGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 1. Brady Corporation.
 2. Craftmark Pipe Markers.
- B. Description: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.
 1. Tag Material: Brass, 0.04-inch or aluminum, 0.031-inch minimum thickness, with predrilled or stamped holes for attachment hardware.
 2. Fasteners: Brass wire link chain or S-hook.
- C. Letter and Background Color: As indicated for specific application under Part 3.
- D. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
 1. Include valve-tag schedule in operation and maintenance data.

2.7 WARNING TAGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 1. Brady Corporation.
 2. Craftmark Pipe Markers.
- B. Description: Preprinted or partially preprinted accident-prevention tags of plasticized card stock with matte finish suitable for writing.
 1. Size: Approximately 4 by 7 inches.
 2. Fasteners: Brass grommet and wire.
 3. Nomenclature: Large-size primary caption, such as "DANGER," "CAUTION," or "DO NOT OPERATE."
 4. Letter and Background Color: As indicated for specific application under Part 3.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean piping and equipment surfaces of incompatible primers, paints, and encapsulants, as well as dirt, oil, grease, release agents, and other substances that could impair bond of identification devices.

3.2 INSTALLATION, GENERAL REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.
- D. Locate identifying devices so that they are readily visible from the point of normal approach.

3.3 INSTALLATION OF EQUIPMENT LABELS, WARNING SIGNS, AND LABELS

- A. Permanently fasten labels on each item of plumbing equipment.
- B. Sign and Label Colors.
 - 1. White letters on an ANSI Z535.1 safety-green background.
- C. Locate equipment labels where accessible and visible.
- D. Arc-Flash Warning Signs: Provide arc-flash warning signs on electrical disconnects and other equipment where arc-flash hazard exists, as indicated on Drawings, and in accordance with requirements of OSHA and NFPA 70E, and other applicable codes and standards.

3.4 INSTALLATION OF WARNING TAPE

- A. Warning Tape Color and Pattern: Yellow background with black diagonal stripes.
- B. Install warning tape on pipes and ducts, with cross-designated walkways providing less than 6 ft. of clearance.
- C. Locate tape so as to be readily visible from the point of normal approach.

3.5 INSTALLATION OF PIPE LABELS

- A. Piping Color Coding: Painting of piping is specified in Division 09.
- B. Install pipe labels showing service and flow direction with permanent adhesive on pipes.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- C. Stenciled Pipe Label Option: Stenciled labels showing service and flow direction may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1, with painted, color-coded bands or rectangles on each piping system.
 - 1. Identification Paint: Use for contrasting background.
 - 2. Stencil Paint: Use for pipe marking.
- D. Pipe-Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 - 1. Within 3 ft. of each valve and control device.
 - 2. At access doors, manholes, and similar access points that permit view of concealed piping.
 - 3. Within 3 ft. of equipment items and other points of origination and termination.
 - 4. Spaced at maximum intervals of 25 ft. along each run. Reduce intervals to 10 ft. in areas of congested piping and equipment.
- E. Do not apply plastic pipe labels or plastic tapes directly to bare pipes conveying fluids at temperatures of 125 deg F or higher. Where these pipes are to remain uninsulated, use a short section of insulation or use stenciled labels.
- F. Flow-Direction Flow Arrows: Use arrows, in compliance with ASME A13.1, to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.
- G. Pipe-Label Color Schedule:
 - 1. Domestic Cold-Water Piping: White letters on an ANSI Z535.1 safety-green background.
 - 2. Sanitary Waste Piping: White letters on a black background.

3.6 INSTALLATION OF VALVE TAGS

- A. Install tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, faucets, convenience and lawn-watering hose connections, and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule in the operating and maintenance manual.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in "Valve-Tag Size and Shape" Subparagraph below:
 - 1. Valve-Tag Size and Shape:
 - a. Domestic Cold Water: 2 inches, round.
 - 2. Valve-Tag Colors:
 - a. For each piping system, use the same lettering and background coloring system on valve tags as used in the piping system labels and background.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

3. List tagged valves in a valve schedule/chart minimum of 8.5" x 11" in aluminum frame with clear laminate face. Install within water service room or as directed by the facility. Indicate valve #, size, Service and Normally Open (N.O.) or Normally Closed (N.C.).

3.7 INSTALLATION OF WARNING TAGS

- A. Warning Tag Color: Black letters on an ANSI Z535.1 safety-yellow background.
- B. Attach warning tags, with proper message, to equipment and other items where required.

END OF SECTION

SECTION 22 07 19
PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes insulating the following plumbing piping services:

1. Domestic cold-water piping.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Detail application of protective shields, saddles, and inserts at hangers for each type of insulation and hanger.
2. Detail insulation application at pipe expansion joints for each type of insulation.
3. Detail insulation application at elbows, fittings, flanges, valves, and specialties for each type of insulation.
4. Detail removable insulation at piping specialties, equipment connections, and access panels.
5. Detail application of field-applied jackets.
6. Detail application at linkages of control devices.

C. Samples: For each type of insulation and jacket indicated. Identify each Sample, describing product and intended use. Sample sizes are as follows:

1. Preformed Pipe Insulation Materials: 12 inches long by NPS 2.
2. Jacket Materials for Pipe: 12 inches long by NPS 2.
3. Sheet Jacket Materials: 12 inches square.
4. Manufacturer's Color Charts: For products where color is specified, show the full range of colors available for each type of finish material.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer.

B. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- C. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Packaging: Insulation system materials are to be delivered to the Project site in unopened containers. The packaging is to include name of the manufacturer, fabricator, type, description, and size, as well as ASTM standard designation and maximum use temperature.

1.6 COORDINATION

- A. Coordinate sizes and locations of supports, hangers, and insulation shields specified in Section 220529 "Hangers and Supports for Plumbing Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.7 SCHEDULING

- A. Schedule insulation application after pressure testing systems. Insulation application may begin on segments that have satisfactory test results.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products in accordance with ASTM E84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation, jacket materials, adhesive, mastic, tapes, and cement material containers with appropriate markings of applicable testing agency.
 - 1. All Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

2.2 INSULATION MATERIALS

- A. Comply with requirements in "Piping Insulation Schedule, General," "Indoor Piping Insulation Schedule," "Outdoor, Aboveground Piping Insulation Schedule," and "Outdoor, Underground Piping Insulation Schedule" articles for where insulating materials are applied.
- B. Products do not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come into contact with stainless steel have a leachable chloride content of less than 50 ppm when tested in accordance with ASTM C871.
- D. Insulation materials for use on austenitic stainless steel are qualified as acceptable in accordance with ASTM C795.
- E. Foam insulation materials do not use CFC or HCFC blowing agents in the manufacturing process.
- F. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Comply with ASTM C552.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Owens Corning.
 - 2. Preformed Pipe Insulation, Type II, Class 1: Unfaced.
 - 3. Preformed Pipe Insulation, Type II, Class 2: With factory-applied ASJ jacket.
 - 4. Fabricated shapes in accordance with ASTM C450, ASTM C585, and ASTM C1639.
 - 5. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.
- G. Flexible Elastomeric: Closed-cell or expanded-rubber materials; suitable for maximum use temperature between minus 70 deg F and 220 deg F. Comply with ASTM C534/C534M, Type I for tubular materials.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Aeroflex USA.
 - b. Armacell LLC.
 - c. K-Flex USA.
- H. Mineral Wool, Preformed Pipe: Mandrel-wound mineral wool fibers bonded with a thermosetting resin, unfaced; suitable for maximum use temperature up to 1200 deg F in accordance with ASTM C447. Comply with ASTM C547.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- a. Johns Manville; a Berkshire Hathaway company.
 - b. Owens Corning.
 - c. ROCKWOOL.
2. Preformed Pipe Insulation: Type II, Grade A with factory-applied ASJ.
 3. Fabricated shapes in accordance with ASTM C450 and ASTM C585.

2.3 INSULATING CEMENTS

A. Mineral Wool Insulating Cement: Comply with ASTM C195.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Ramco Insulation, Inc.

B. Expanded or Exfoliated Vermiculite Insulating Cement: Comply with ASTM C196.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Ramco Insulation, Inc.

C. Mineral Wool Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C449.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Ramco Insulation, Inc.

2.4 ADHESIVES

A. Materials are compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.

B. Cellular-Glass Adhesive: Two-component, thermosetting urethane adhesive containing no flammable solvents, with a service temperature range of minus 100 to plus 200 deg F.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

- a. Foster Brand; H. B. Fuller Construction Products.

2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Flexible Elastomeric Adhesive: Solvent-based adhesive.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Aeroflex USA.
 - b. Armacell LLC.
 - c. Foster Brand; H. B. Fuller Construction Products.
 - d. K-Flex USA.
 2. Flame-spread index is 25 or less and smoke-developed index is 50 or less as tested in accordance with ASTM E84.
 3. Wet Flash Point: Below 0 deg F.
 4. Service Temperature Range: 40 to 200 deg F.
 5. Color: Black.
 6. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. Mineral Wool Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- E. ASJ Adhesive and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A, for bonding insulation jacket lap seams and joints.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
 2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- F. PVC Jacket Adhesive: Compatible with PVC jacket.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Johns Manville; a Berkshire Hathaway company.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- b. P.I.C. Plastics, Inc.
 - c. Speedline Corporation.
 - d. The Dow Chemical Company.
2. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.5 SEALANTS

- A. Materials are as recommended by the insulation manufacturer and are compatible with insulation materials, jackets, and substrates.
- B. Joint Sealants:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
 - d. Owens Corning.
 2. Materials shall be compatible with insulation materials, jackets and substrates.
 3. Fire and water-resistant, elastomeric sealant.
 4. Service Temperature Range: Minus 100 to plus 300 deg F.
 5. Color: White or gray.
 6. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. FSK and Metal Jacket Flashing Sealants:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
 - c. Mon-Eco Industries, Inc.
 2. Fire- and water-resistant, flexible, elastomeric sealant.
 3. Service Temperature Range: Minus 40 to plus 250 deg F.
 4. Color: Aluminum.
 5. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- D. ASJ Flashing Sealants and PVC Jacket Flashing Sealants:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Childers Brand; H. B. Fuller Construction Products.
 - b. Foster Brand; H. B. Fuller Construction Products.
2. Fire- and water-resistant, flexible, elastomeric sealant.
3. Service Temperature Range: Minus 40 to plus 250 deg F.
4. Color: White.
5. For indoor applications, adhesive shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.6 FACTORY-APPLIED JACKETS

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
 1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C1136, Type I.
 2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C1136, Type I.
 3. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C1136, Type II.

2.7 FIELD-APPLIED JACKETS

- A. Field-applied jackets comply with ASTM C1136, Type I, unless otherwise indicated.
- B. FSK Jacket: Aluminum-foil-face, fiberglass-reinforced scrim with kraft-paper backing.
- C. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D1784, Class 16354-C; thickness as scheduled; roll stock ready for shop or field cutting and forming. Thickness is indicated in field-applied jacket schedules.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Johns Manville; a Berkshire Hathaway company.
 - b. P.I.C. Plastics, Inc.
 - c. Proto Corporation.
 - d. Speedline Corporation.
 2. Adhesive: As recommended by jacket material manufacturer.
 3. Color: White.
 4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.

D. Metal Jacket:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Johns Manville; a Berkshire Hathaway company.
 - b. RPR Products, Inc.
2. Aluminum Jacket: Comply with ASTM B209, Alloy 3003, 3005, 3105, or 5005, Temper H-14.
 - a. Sheet and roll stock ready for shop or field sizing.
 - b. Finish and thickness are indicated in field-applied jacket schedules.
 - c. Moisture Barrier for Indoor Applications: 1-mil-thick, heat-bonded polyethylene and kraft paper.
 - d. Moisture Barrier for Outdoor Applications: 3-mil-thick, heat-bonded polyethylene and kraft paper.
 - e. Factory-Fabricated Fitting Covers:
 - 1) Same material, finish, and thickness as jacket.
 - 2) Preformed two-piece or gore, 45- and 90-degree, short- and long-radius elbows.
 - 3) Tee covers.
 - 4) Flange and union covers.
 - 5) End caps.
 - 6) Beveled collars.
 - 7) Valve covers.
 - 8) Field fabricate fitting covers only if factory-fabricated fitting covers are not available.

E. Underground Direct-Buried Jacket: 125-mil-thick vapor barrier and waterproofing membrane, consisting of a rubberized bituminous resin reinforced with a woven-glass fiber or polyester scrim and laminated aluminum foil.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Owens Corning.
 - b. Polyguard Products, Inc.

2.8 TAPES

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C1136.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Avery Dennison Corporation, Specialty Tapes Division.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
 2. Width: 3 inches.
 3. Thickness: 11.5 mils.
 4. Adhesion: 90 ounces force/inch in width.
 5. Elongation: 2 percent.
 6. Tensile Strength: 40 lbf/inch in width.
 7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.
- B. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C1136.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Avery Dennison Corporation, Specialty Tapes Division.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
 2. Width: 3 inches.
 3. Thickness: 6.5 mils.
 4. Adhesion: 90 ounces force/inch in width.
 5. Elongation: 2 percent.
 6. Tensile Strength: 40 lbf/inch in width.
 7. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.
- C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive; suitable for indoor and outdoor applications.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Ideal Tape Co., Inc., an American Biltrite Company.
 2. Width: 2 inches.
 3. Thickness: 6 mils.
 4. Adhesion: 64 ounces force/inch in width.
 5. Elongation: 500 percent.
 6. Tensile Strength: 18 lbf/inch in width.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. 3M Industrial Adhesives and Tapes Division.
 - b. Avery Dennison Corporation, Specialty Tapes Division.
 - c. Ideal Tape Co., Inc., an American Biltrite Company.
 - d. Knauf Insulation.
 2. Width: 2 inches.
 3. Thickness: 3.7 mils.
 4. Adhesion: 100 ounces force/inch in width.
 5. Elongation: 5 percent.
 6. Tensile Strength: 34 lbf/inch in width.

2.9 SECUREMENTS

- A. Bands:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Johns Manville; a Berkshire Hathaway company.
 - b. RPR Products, Inc.
 2. Stainless Steel: ASTM A240/A240M, Type 304 or Type 316; 0.015 inch thick, 1/2 inch wide with wing seal or closed seal.
 3. Aluminum: ASTM B209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing seal or closed seal.
- B. Staples: Outward-clinching insulation staples, nominal 3/4-inch-wide, stainless steel or Monel.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.
1. Verify that systems to be insulated have been tested and are free of defects.
 2. Verify that surfaces to be insulated are clean and dry.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

3.2 PREPARATION

- A. Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless steel surfaces, use demineralized water.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of piping, including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and of thicknesses required for each item of pipe system, as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, compress, or otherwise damage insulation or jacket.
- D. Install insulation with longitudinal seams at top and bottom (12 o'clock and 6 o'clock positions) of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during storage, application, and finishing. Replace insulation materials that get wet during storage or in the installation process before being properly covered and sealed in accordance with Contract Documents.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- K. Install insulation with factory-applied jackets as follows:
 - 1. Draw jacket tight and smooth, but not to the extent of creating wrinkles or areas of compression in the insulation.
 - 2. Cover circumferential joints with 3-inch-wide strips of same material as insulation jacket. Secure strips with adhesive and outward-clinching staples along both edges of strip, spaced 4 inches o.c.
 - 3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward-clinching staples along edge at 4 inches o.c.
 - a. For below-ambient services, apply vapor-barrier mastic over staples.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

4. Cover joints and seams with tape, in accordance with insulation material manufacturer's written instructions, to maintain vapor seal.
 5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- L. Cut insulation in a manner to avoid compressing insulation.
- M. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches in similar fashion to butt joints.
- O. For above-ambient services, do not install insulation to the following:
1. Vibration-control devices.
 2. Testing agency labels and stamps.
 3. Nameplates and data plates.
 4. Cleanouts.

3.4 PENETRATIONS

- A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation above roof surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
 4. Seal jacket to roof flashing with flashing sealant.
- B. Insulation Installation at Underground Exterior Wall Penetrations: Terminate insulation flush with sleeve seal. Seal terminations with flashing sealant.
- C. Insulation Installation at Aboveground Exterior Wall Penetrations: Install insulation continuously through wall penetrations.
1. Seal penetrations with flashing sealant.
 2. For applications requiring only indoor insulation, terminate insulation inside wall surface and seal with joint sealant. For applications requiring indoor and outdoor insulation, install insulation for outdoor applications tightly joined to indoor insulation ends. Seal joint with joint sealant.
 3. Extend jacket of outdoor insulation outside wall flashing and overlap wall flashing at least 2 inches.
 4. Seal jacket to wall flashing with flashing sealant.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- D. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- E. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions with an FM Approved or UL Listed firestopping material or assembly.
- F. Insulation Installation at Floor Penetrations:
 - 1. Pipe: Install insulation continuously through floor penetrations.
 - 2. Seal penetrations through fire-rated assemblies.

3.5 GENERAL PIPE INSULATION INSTALLATION

- A. Requirements in this article generally apply to all insulation materials, except where more specific requirements are specified in various pipe insulation material installation articles below.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, Mechanical Couplings, and Unions:
 - 1. Install insulation over fittings, valves, strainers, flanges, mechanical couplings, unions, and other specialties with continuous thermal and vapor-retarder integrity unless otherwise indicated.
 - 2. Insulate pipe elbows using preformed fitting insulation or mitered or routed fittings made from same material and density as that of adjacent pipe insulation. Each piece is butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
 - 3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as that used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
 - 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as that used for adjacent pipe. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
 - 5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers, so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below-ambient services, provide a design that maintains vapor barrier.
 - 6. Insulate flanges, mechanical couplings, and unions, using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than 2 times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Stencil or label the outside insulation jacket of each union with the word "union" matching size and color of pipe labels.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below-ambient services and a breather mastic for above-ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
 8. For services not specified to receive a field-applied jacket, except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing, using PVC tape.
- C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

3.6 INSTALLATION OF CELLULAR-GLASS INSULATION

A. Insulation Installation on Straight Pipes and Tubes:

1. Secure each layer of insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with jackets on above-ambient services, secure laps with outward-clinched staples at 6 inches on center.
4. For insulation with jackets on below-ambient services, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive, as recommended by insulation material manufacturer, and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install prefabricated pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of cellular-glass block insulation of same thickness as that of pipe insulation. Where voids are difficult to fill with block insulation, fill the voids with a fibrous insulation material suitable for the specific operating temperature.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install prefabricated sections of same material as that of straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
2. When preformed sections of insulation are not available, install mitered or routed sections of cellular-glass insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Install prefabricated sections of cellular-glass insulation to valve body.
2. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
3. Install insulation to flanges as specified for flange insulation application.

3.7 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

- A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- B. Insulation Installation on Pipe Flanges:
 1. Install pipe insulation to outer diameter of pipe flange.
 2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
 3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with cut sections of sheet insulation of same thickness as that of pipe insulation.
 4. Secure insulation to flanges and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- C. Insulation Installation on Pipe Fittings and Elbows:
 1. Install sections of pipe insulation and miter if required in accordance with manufacturer's written instructions.
 2. Secure insulation materials and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
- D. Insulation Installation on Valves and Pipe Specialties:
 1. Install prefabricated valve covers manufactured of same material as that of pipe insulation when available.
 2. When prefabricated valve covers are not available, install cut sections of pipe and sheet insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
 3. Install insulation to flanges as specified for flange insulation application.
 4. Secure insulation to valves and specialties, and seal seams with manufacturer's recommended adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

3.8 INSTALLATION OF GLASS-FIBER AND MINERAL WOOL INSULATION

- A. Insulation Installation on Straight Pipes and Tubes:
 1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
 2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

3. For insulation with jackets on above-ambient surfaces, secure laps with outward-clinched staples at 6 inches o.c.
4. For insulation with jackets on below-ambient surfaces, do not staple longitudinal tabs. Instead, secure tabs with additional adhesive, as recommended by insulation material manufacturer, and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:

1. Install prefabricated pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with glass-fiber or mineral-wool blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:

1. Install prefabricated sections of same material as that of straight segments of pipe insulation when available.
2. When prefabricated insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:

1. Install prefabricated sections of same material as that of straight segments of pipe insulation when available.
2. When prefabricated sections are not available, install fabricated sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

3.9 INSTALLATION OF FIELD-APPLIED JACKETS

A. Where glass-cloth jackets are indicated, install directly over bare insulation or insulation with factory-applied jackets.

1. Draw jacket smooth and tight to surface with 2-inch overlap at seams and joints.
2. Embed glass cloth between two 0.062-inch-thick coats of lagging adhesive.
3. Completely encapsulate insulation with coating, leaving no exposed insulation.

B. Where FSK jackets are indicated, install as follows:

1. Draw jacket material smooth and tight.
2. Install lap or joint strips with same material as jacket.
3. Secure jacket to insulation with manufacturer's recommended adhesive.
4. Install jacket with 1-1/2-inch laps at longitudinal seams and 3-inch-wide joint strips at end joints.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-barrier mastic.
- C. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.
1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.
- D. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless steel bands 12 inches on center and at end joints.

3.10 FINISHES

- A. Insulation with ASJ, Glass-Cloth, or Other Paintable Jacket Material: Paint jacket with paint system identified below.
1. Flat Acrylic Finish: Two finish coats over a primer that is compatible with jacket material and finish coat paint. Add fungicidal agent to render fabric mildew proof.
 - a. Finish Coat Material: Interior, flat, latex-emulsion size.
- B. Flexible Elastomeric Thermal Insulation: After adhesive has fully cured, apply two coats of insulation manufacturer's recommended protective coating.
- C. Color: Final color as selected by Architect. Vary first and second coats to allow visual inspection of the completed Work.
- D. Do not field paint aluminum or stainless-steel jackets.

3.11 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections.
- B. Engage a qualified testing agency to perform tests and inspections.
- C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- D. Perform tests and inspections.
- E. Tests and Inspections: Inspect pipe, fittings, strainers, and valves, randomly selected by Engineer, by removing field-applied jacket and insulation in layers in reverse order of their installation. Extent of inspection is limited to three locations of straight pipe, three locations of threaded fittings, three locations of welded fittings, two locations of threaded strainers, two locations of welded strainers, three locations of threaded valves, and three locations of flanged valves for each pipe service defined in the "Piping Insulation Schedule, General" Article.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- F. All insulation applications will be considered defective if they do not pass tests and inspections.
- G. Prepare test and inspection reports.

3.12 PIPING INSULATION SCHEDULE, GENERAL

- A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 - 1. Drainage piping located in crawl spaces.
 - 2. Underground piping.
 - 3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

3.13 INDOOR PIPING INSULATION SCHEDULE

- A. Domestic Cold Water:
 - 1. NPS 1-1/4 and Smaller: Insulation is one of the following:
 - a. Cellular Glass: 1/2 inch thick.
 - b. Flexible Elastomeric: 1/2 inch thick.
 - c. Mineral-Wool, Preformed Pipe Insulation, Type II: 1 inch thick.
 - 2. NPS 1-1/2 and Larger: Insulation is one of the following:
 - a. Cellular Glass: 1 inch thick.
 - b. Flexible Elastomeric: 1 inch thick.
 - c. Mineral Wool, Preformed Pipe Insulation, Type II: 1 inch thick.

3.14 INDOOR, FIELD-APPLIED JACKET SCHEDULE

- A. Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket.
- B. If more than one material is listed, selection from materials listed is Contractor's option.
- C. Piping, Exposed.
 - 1. All exposed cold-water piping and fittings which are exposed to view shall be completely covered with white Zeston 2000 PVC insulated piping and fitting covers from the floor up to 10' above the floor. Apply as per manufacturer with perma weld adhesive. All labels and flow arrows shall be applied over PVC jacket.

END OF SECTION

SECTION 22 11 16

DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Copper tube and fittings
2. Ductile iron pipe and fittings
3. Pipe joining materials
4. Specialty valves
5. Transition fittings
6. Dielectric fittings.

B. Related Section:

1. Division 22 Section "Facility Water Distribution Piping" for water-service piping and water meters outside the building from source to the point where water-service piping enters the building.

1.3 SUBMITTALS

A. Product Data: For the following products:

1. Specialty valves.
2. Transition fittings.
3. Dielectric fittings.
4. Flexible connectors.

B. Water Samples: Specified in "Cleaning" Article.

C. Coordination Drawings: For piping in equipment rooms and other congested areas, drawn to scale, on which the following items are shown and coordinated with each other, using input from Installers of the items involved:

1. Fire-suppression-water piping.
2. Domestic water piping, storm water piping and sanitary piping.
3. HVAC hydronic piping and Ductwork.
4. Electrical conduits.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- D. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 61 for potable domestic water piping and components.

1.5 PROJECT CONDITIONS

- A. Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:
 - 1. Notify Construction Manager, Owner no fewer than two days in advance of proposed interruption of water service.
 - 2. Do not proceed with interruption of water service without Construction Manager's, Owner's written permission.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.
- B. Potable-water piping and components shall comply with NSF 14 and NSF 61 Annex G. Plastic piping components shall be marked with "NSF-pw."
- C. All materials shall comply with NSF/ANSI Standard 732 for lead free.

2.2 COPPER TUBE AND FITTINGS

- A. Hard Copper Tube: ASTM B 88, Type L water tube, drawn temper.
 - 1. Wrought-Copper Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
 - 2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint ends.
 - 3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.
- B. Copper Unions:
 - 1. MSS SP-123.
 - 2. Cast-copper-alloy, hexagonal-stock body.
 - 3. Ball-and-socket, metal-to-metal seating surfaces.
 - 4. Solder-joint or threaded ends.
- C. Copper-Tube, Extruded-Tee Connections:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Apollo Valves; Conbraco Industries, Inc.
 - b. Elkhart Products Corporation.
 - c. Mueller Industries, Inc.
 - d. NIBCO INC.
2. Description: Tee formed in copper tube according to ASTM F 2014.

2.3 DUCTILE-IRON PIPE AND FITTINGS

- A. Mechanical-Joint, Ductile-Iron Pipe:
 1. AWWA C151/A21.51, with mechanical-joint bell and plain spigot end unless grooved or flanged ends are indicated.
 2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
- B. Standard-Pattern, Mechanical-Joint Fittings:
 1. AWWA C110/A21.10, ductile or gray iron.
 2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
- C. Compact-Pattern, Mechanical-Joint Fittings:
 1. AWWA C153/A21.53, ductile iron.
 2. Glands, Gaskets, and Bolts: AWWA C111/A21.11, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
- D. Plain-End, Ductile-Iron Pipe: AWWA C151/A21.51.
- E. NPS 20 to NPS 46: 150 psig

2.4 PIPING JOINING MATERIALS

- A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8-inch-thick or ASME B16.21, nonmetallic and asbestos free, unless otherwise indicated; full-face or ring type unless otherwise indicated.
- B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.
- C. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813. Lead free
- D. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

2.5 SPECIALTY VALVES

- A. Comply with requirements in Division 22 Section "General-Duty Valves for Plumbing Piping" for general-duty metal valves.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- B. Comply with requirements in Division 22 Section "Domestic Water Piping Specialties" for balancing valves, drain valves, backflow preventers, and vacuum breakers.

2.6 TRANSITION FITTINGS

A. General Requirements:

- 1. Same size as pipes to be joined.
- 2. Pressure rating at least equal to pipes to be joined.
- 3. End connections compatible with pipes to be joined.

- B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.

2.7 DIELECTRIC FITTINGS

- A. General Requirements: Assembly of copper alloy and ferrous materials or ferrous material body with separating nonconductive insulating material suitable for system fluid, pressure, and temperature.

B. Dielectric Unions:

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Capitol Manufacturing Company.
 - b. Central Plastics Company.
 - c. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
 - d. Zurn Plumbing Products Group; Wilkins Water Control Products.
- 2. Description:
 - a. Pressure Rating: 150 psig at 180 deg F.
 - b. End Connections: Solder-joint copper alloy and threaded ferrous.

C. Dielectric Flanges:

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Capitol Manufacturing Company.
 - b. Central Plastics Company.
 - c. EPCO Sales, Inc.
 - d. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
- 2. Description:
 - a. Factory-fabricated, bolted, companion-flange assembly.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- b. Pressure Rating: 150 psig.
- c. End Connections: Solder-joint copper alloy and threaded ferrous; threaded solder-joint copper alloy and threaded ferrous.

D. Dielectric-Flange Kits:

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Advance Products & Systems, Inc.
 - b. Calpico, Inc.
 - c. Central Plastics Company.
 - d. Pipeline Seal and Insulator, Inc.
- 2. Description:
 - a. Nonconducting materials for field assembly of companion flanges.
 - b. Pressure Rating: 150 psig.
 - c. Gasket: Neoprene or phenolic.
 - d. Bolt Sleeves: Phenolic or polyethylene.
 - e. Washers: Phenolic with steel backing washers.

E. Dielectric Couplings:

- 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Calpico, Inc.
 - b. Lochinvar Corporation.
- 2. Description:
 - a. Galvanized-steel coupling.
 - b. Pressure Rating: 300 psig at 225 deg F.
 - c. End Connections: Female threaded.
 - d. Lining: Inert and noncorrosive, thermoplastic.

F. Dielectric Nipples:

- 1. Standard: IAPMO PS 66.
- 2. Electroplated steel nipple complying with ASTM F1545.
- 3. Pressure Rating and Temperature: 300 psig at 225 deg F.
- 4. End Connections: Male threaded or grooved.
- 5. Lining: Inert and noncorrosive, propylene.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of domestic water piping. Indicated locations and arrangements are used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."
- C. Install ductile-iron piping under building slab with restrained joints according to AWWA C600 and AWWA M41.
- D. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside the building at each domestic water service entrance. Comply with requirements in Division 22 Section "Domestic Water Piping Specialties" for drain valves and strainers.
- E. Install shutoff valve immediately upstream of each dielectric fitting.
- F. Install domestic water piping level without pitch and plumb.
- G. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
- H. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- I. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal, and coordinate with other services occupying that space.
- J. Install piping adjacent to equipment and specialties to allow service and maintenance.
- K. Install piping to permit valve servicing.
- L. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than system pressure rating used in applications below unless otherwise indicated.
- M. Install piping free of sags and bends.
- N. Install fittings for changes in direction and branch connections.
- O. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
- P. Install pressure gages on suction and discharge piping for each plumbing pump and packaged booster pump. Comply with requirements for pressure gages in Section 220519 "Meters and Gages for Plumbing Piping."

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- Q. Install thermometers on inlet and outlet piping from each water heater. Comply with requirements for thermometers in Section 220519 "Meters and Gages for Plumbing Piping."
- R. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."
- S. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 22 Section "Sleeves and Sleeve Seals for Plumbing Piping."
- T. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 22 Section "Escutcheons for Plumbing Piping."
- U. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."

3.2 JOINT CONSTRUCTION

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- D. Brazed Joints: Join copper tube and fittings according to CDA's "Copper Tube Handbook," "Braze Joints" Chapter.
- E. Soldered Joints: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
- F. Joint Construction for Grooved-End, Ductile-Iron Piping: Make joints according to AWWA C606. Cut round-bottom grooves in ends of pipe at gasket-seat dimension required for specified (flexible or rigid) joint. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections over gasket with keys seated in piping grooves. Install and tighten housing bolts
- G. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for domestic water service. Join flanges with gasket and bolts according to ASME B31.9.
- H. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

3.3 VALVE INSTALLATION

- A. General-Duty Valves: Comply with requirements in Division 22 Section "General-Duty Valves for Plumbing Piping" for valve installations.
- B. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball or gate valves for piping NPS 2 and smaller. Use butterfly or gate valves for piping NPS 2-1/2 and larger.
- C. Install drain valves for equipment at base of each water riser, at low points in horizontal piping, and where required to drain water piping. Drain valves are specified in Division 22 Section "Domestic Water Piping Specialties."
 - 1. Hose-End Drain Valves: At low points in water mains, risers, and branches.
 - 2. Stop-and-Waste Drain Valves: Instead of hose-end drain valves where indicated.
- D. Install pressure reducing valves at building water service after back flow preventer in all building where the static water pressure is greater than 80 PSI. pressure reducing valves shall be listed and labeled as being in conformance with ASSE 1003 and CSA B356.

3.4 DIELECTRIC FITTING INSTALLATION

- 1. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing.
- 2. Dielectric Fittings for NPS 2 and Smaller: Use dielectric couplings or nipples or unions.
- 3. Dielectric Fittings for NPS 2-1/2 to NPS 4: Use dielectric flanges.
- 4. Dielectric Fittings for NPS 5 and Larger: Use dielectric flange kits.

3.5 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements in Division 22 Section "Vibration and Seismic Controls for Plumbing Piping and Equipment" for seismic-restraint devices.
- B. Comply with requirements in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support products and installation.
 - 1. Vertical Piping: MSS Type 8 or 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet If Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
 - 2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
 - 3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
 - 4. NPS 2-1/2: 108 inches with 1/2-inch rod.
 - 5. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
- F. Install supports for vertical copper tubing every 10 feet
- G. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

3.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment and machines to allow service and maintenance.
- C. Connect domestic water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to water-service piping with shutoff valve; extend and connect to the following:
 - 1. Equipment: Cold-water-supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection. Use flanges instead of unions for NPS 2-1/2 and larger.

3.7 IDENTIFICATION

- A. Identify system components. Comply with requirements in Division 22 Section "Identification for Plumbing Piping and Equipment" for identification materials and installation.
- B. Label pressure piping with system operating pressure.

3.8 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Piping Inspections:
 - 1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
 - 2. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
3. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
 4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- C. Piping Tests:
1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
 2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
 3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
 4. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
 5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
 6. Prepare reports for tests and for corrective action required.
- D. Domestic water piping will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports. Submit for engineers review and approval.

3.9 ADJUSTING

- A. Perform the following adjustments before operation:
1. Close drain valves, hydrants, and hose bibbs.
 2. Open shutoff valves to fully open position.
 3. Open throttling valves to proper setting.
 4. Remove plugs used during testing of piping and for temporary sealing of piping during installation.
 5. Remove and clean strainer screens. Close drain valves and replace drain plugs.
 6. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
 7. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.10 CLEANING

- A. Clean and disinfect potable domestic water piping as follows:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
 - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
 - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

B. Prepare and submit reports of purging and disinfecting activities.

C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

3.11 PIPING SCHEDULE

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Fitting Option: Extruded-tee connections and brazed joints may be used on aboveground copper tubing.
- D. Aboveground domestic water distribution piping, NPS 2 and smaller, shall be one of the following:
 1. Hard copper tube, ASTM B 88, Type L; copper, solder-joint fittings; and joints.
 2. (Hard copper tube, ASTM B 88, Type L; copper pressure-seal-joint fittings; and pressure-sealed joints.)
- E. Aboveground domestic water piping, NPS 2-1/2 to NPS 4, shall be one of the following:
 1. Hard copper tube, ASTM B 88, Type L; cast- or wrought-copper, solder-joint fittings; and brazed soldered joints.
- F. Aboveground domestic water piping, NPS 5 to NPS 8, shall be one of the following:
 1. Hard copper tube, ASTM B 88, Type L; cast- or wrought-copper, solder-joint fittings; and brazed soldered joints.
- G. Aboveground, combined domestic water-service and fire-service-main piping, NPS 6 to NPS 12, shall be one of the following:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Plain-end, ductile-iron pipe; grooved-joint, ductile-iron-pipe appurtenances; and grooved joints.

3.12 VALVE SCHEDULE

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 1. Shutoff Duty: Use ball or gate valves for piping NPS 2 and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 2-1/2 and larger.
 2. Throttling Duty: Use ball or globe valves for piping NPS 2 and smaller. Use ball valves with flanged ends for piping NPS 2-1/2 and larger.
 3. Drain Duty: Hose-end drain valves.
- B. Use check valves to maintain correct direction of domestic water flow to and from equipment.
- C. Iron grooved-end valves may be used with grooved-end piping.

END OF SECTION

SECTION 22 11 19

DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Backflow preventers.
2. Hose Bibbs.
3. Drain valves.
4. Water meters.

B. Related Requirements:

1. Section 220519 "Meters and Gauges for Plumbing Piping" for thermometers, pressure gauges, and flow meters in domestic water piping.
2. Section 221116 "Domestic Water Piping" for water meters.

1.2 DEFINITIONS

A. AMI: Advanced Metering Infrastructure.

B. AMR: Automatic Meter Reading.

C. FKM: A family of fluoroelastomer materials defined by ASTM D1418.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For domestic water piping specialties.

1. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Test and inspection reports.

B. Field quality-control reports.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For domestic water piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PIPING SPECIALTIES

- A. Domestic water piping specialties intended to convey or dispense water for human consumption are to comply with the SDWA, requirements of authorities having jurisdiction, and NSF 61 and NSF 372, or to be certified in compliance with NSF 61 and NSF 372 by an American National Standards Institute (ANSI)-accredited third-party certification body that the weighted average lead content at wetted surfaces is less than or equal to 0.25 percent.

2.2 PERFORMANCE REQUIREMENTS

- A. Minimum Working Pressure for Domestic Water Piping Specialties: 125 psig unless otherwise indicated.

2.3 BACKFLOW PREVENTERS

- A. Reduced-Pressure-Principle Backflow Preventers:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Watts Water Technologies; a Watts company.
2. Standard: ASSE 1013.
3. Operation: Continuous-pressure applications.
4. Pressure Loss: 12 psig maximum, through middle third of flow range.
5. Size: As indicated on Contract Drawings.
6. Design Flow Rate: As indicated on Contract Drawings.
7. End Connections: Flanged for NPS 2-1/2 and larger.
8. Configuration: Designed for horizontal, straight-through flow.
9. Accessories:
 - a. Valves NPS 2 and Smaller: Ball type with threaded ends on inlet and outlet.
 - b. Valves NPS 2-1/2 and Larger: Outside-screw and yoke-gate type with flanged ends on inlet and outlet.
 - c. Air-Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.

- B. Backflow-Preventer Test Kits:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Watts Water Technologies; a Watts company.
2. Description: Factory calibrated, with gauges, fittings, hoses, and carrying case with test-procedure instructions.

2.4 HOSE BIBBS

A. Hose Bibbs:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Jay R. Smith Mfg Co; a division of Morris Group International.
 - b. Watts Water Technologies; a Watts company.
 - c. Zurn Industries, LLC.
2. Standard: ASME A112.18.1 for sediment faucets.
3. Body Material: Bronze.
4. Seat: Bronze, replaceable.
5. Supply Connections: NPS 1/2 or NPS 3/4 threaded or solder-joint inlet.
6. Outlet Connection: Garden-hose thread complying with ASME B1.20.7.
7. Pressure Rating: 125 psig.
8. Vacuum Breaker: Integral nonremovable, drainable, hose-connection vacuum breaker complying with ASSE 1011.
9. Finish for Equipment Rooms: Rough bronze, or chrome or nickel plated.
10. Finish for Service Areas: Chrome or nickel plated.
11. Finish for Finished Rooms: Chrome or nickel plated.
12. Operation for Equipment Rooms: Wheel handle or operating key.
13. Operation for Service Areas: Operating key.
14. Operation for Finished Rooms: Operating key.
15. Include operating key with each operating-key hose bibb.
16. Include integral wall flange with each chrome- or nickel-plated hose bibb.

2.5 DRAIN VALVES

A. Ball-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-110 for standard-port, two-piece ball valves.
2. Pressure Rating: 400-psig minimum CWP.
3. Size: NPS 3/4.
4. Body: Copper alloy.
5. Ball: Chrome-plated brass.
6. Seats and Seals: Replaceable.
7. Handle: Vinyl-covered steel.
8. Inlet: Threaded or solder joint.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

9. Outlet: Threaded, short nipple with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

B. Gate-Valve-Type, Hose-End Drain Valves:

1. Standard: MSS SP-80 for gate valves.
2. Pressure Rating: Class 125.
3. Size: NPS 3/4.
4. Body: ASTM B62 bronze.
5. Inlet: NPS 3/4 threaded or solder joint.
6. Outlet: Garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

2.6 WATER METERS

A. Fire Service-Type Water Meters:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Sensus; a Xylem brand.
2. Standard: AWWA C703.
3. Approval: NSF/ANSI Standard 61, Annex f and G
4. Pressure Rating: 150-psig working pressure.
5. Strainer: Sensus V-shaped, UL Listed/FM Approved
6. Registration: In hundreds cubic feet as required by utility company.
7. Operating Temperature: 33 deg F to 150 deg F
8. End Connections: Threaded or flanged.

PART 3 - EXECUTION

3.1 INSTALLATION OF PIPING SPECIALTIES

A. Backflow Preventers: Install in each water supply to mechanical equipment and systems and to other equipment and water systems that may be sources of contamination. Comply with authorities having jurisdiction.

1. Locate backflow preventers in same room as connected equipment or system.
2. Install drain for backflow preventers with atmospheric-vent drain connection with air-gap fitting, fixed air-gap fitting, or equivalent positive pipe separation of at least two pipe diameters in drain piping and pipe-to-floor drain. Locate air-gap device attached to or under backflow preventer. Simple air breaks are unacceptable for this application.
3. Do not install bypass piping around backflow preventers.

3.2 PIPING CONNECTIONS

A. Drawings indicate general arrangement of piping, fittings, and specialties.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- B. When installing piping specialties adjacent to equipment and machines, allow space for service and maintenance.

3.3 ELECTRICAL CONNECTIONS

- A. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."
- C. Install electrical devices furnished by manufacturer, but not factory mounted, in accordance with NFPA 70 and NECA 1.

3.4 CONTROL CONNECTIONS

- A. Connect control wiring in accordance with Section 260523 "Control-Voltage Electrical Power Cables."

3.5 IDENTIFICATION

- A. Plastic Labels for Equipment: Install engraved plastic-laminate equipment nameplate or sign on or near each of the following:
 - 1. Backflow preventers.
 - 2. Hose Bibbs.
 - 3. Water meters.
- B. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.6 ADJUSTING

- A. Set field-adjustable pressure set points of water pressure-reducing valves.
- B. Set field-adjustable flow set points of balancing valves.
- C. Set field-adjustable temperature set points of temperature-actuated, water mixing valves.
- D. Adjust each reduced-pressure-principle backflow preventer in accordance with manufacturer's written instructions, authorities having jurisdiction and the device's reference standard.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform the following tests and inspections with the assistance of a factory-authorized service representative.
 - 1. Test each reduced-pressure-principle backflow preventer according to authorities having jurisdiction and the device's reference standard.
 - 2. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 3. Operational Test: After electrical circuitry has been energized, start units to confirm unit operation.
 - 4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Domestic water piping specialties will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

END OF SECTION

SECTION 22 13 16

SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Hubless, cast-iron soil pipe and fittings.
- 2. Specialty pipe fittings.

- B. Related Requirements:

- 1. Section 221319 "Sanitary Waste Piping Specialties".

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
- C. Shop Drawings: Include plans, elevations, sections, and details.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Plans and elevations or Building Information Model (BIM) drawn to scale, showing items described in this Section and coordinated with all building trades.
- B. Seismic Qualification Certificates: For waste and vent piping, accessories, and components, from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 - 2. Detailed description of piping anchorage devices on which the certification is based and their installation requirements.
- C. Field quality-control reports.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1.5 FIELD CONDITIONS

- A. Interruption of Existing Sanitary Waste Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service in accordance with requirements indicated:
 - 1. Notify Construction Manager and Owner no fewer than two days in advance of proposed interruption of sanitary waste service.
 - 2. Do not proceed with interruption of sanitary waste service without Construction Manager's and Owner's written permission.

1.6 WARRANTY

- A. Listed manufacturers to provide labeling and warranty of their respective products.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Components and installation are capable of withstanding the following minimum working pressure unless otherwise indicated:
 - 1. Waste Piping: 300 ft. head of water.

2.2 PIPING MATERIALS

- A. Piping materials to bear label, stamp, or other markings of specified testing agency.
- B. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

2.3 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. AB & I Foundry; a part of the McWane family of companies.
 - 2. Charlotte Pipe and Foundry Company.
- B. Pipe and Fittings:
 - 1. Marked with CISPI collective trademark.
 - 2. ASTM A888 or CISPI 301.
- C. CISPI, Hubless-Piping Couplings:

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe and Foundry Company.
 - c. Dallas Specialty & Mfg. Co.
 - d. MIFAB, Inc.
 2. Standards: ASTM C1277 and CISPI 310.
 3. Description: Stainless steel corrugated shield with stainless steel bands and tightening devices; and ASTM C564, rubber sleeve with integral, center pipe stop.
- D. Heavy-Duty, Hubless-Piping Couplings:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe and Foundry Company.
 - c. Dallas Specialty & Mfg. Co.
 - d. MIFAB, Inc.
 2. Standards: ASTM C1277 and ASTM C1540.
 3. Description: Stainless steel shield with stainless steel bands and tightening devices; and ASTM C564, rubber sleeve with integral, center pipe stop.
- E. Cast-Iron, Hubless-Piping Couplings:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ANACO-Husky.
 - b. Charlotte Pipe and Foundry Company.
 - c. Dallas Specialty & Mfg. Co.
 - d. MIFAB, Inc.
 2. Standards: ASTM C1277.
 3. Description: Two-piece ASTM A48/A48M, cast-iron housing, stainless-steel bolts and nuts, and ASTM C 564, rubber sleeve with integral center pipe stop.
- F. No Hub Fitting Restraints
1. Basis-of-Design Product: Subject to compliance with requirements, provide Holdrite: 117 Series No Hub Fitting Restraints or comparable
 2. Description: CISPI Designation 301-12, large diameter no-hub cast iron fittings, 4" and over in size, shall be provided with supplemental support to minimize the risk of joints separation under high thrust conditions. Auxiliary restraint products used shall be manufactured assemblies with thrust pressure rating adequate for the specific installation. Field devised methods and materials shall not be used to accomplish this application solution

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems.
 - 1. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations.
 - 2. Install piping as indicated unless deviations to layout are approved on coordination drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping at indicated slopes.
- E. Install piping free of sags and bends.
- F. Install fittings for changes in direction and branch connections.
- G. Install piping to allow application of insulation.
- H. Make changes in direction for waste drainage piping using appropriate branches, bends, and long-sweep bends.
 - 1. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical.
 - 2. Use long-turn, double Y-branch, and 1/8-bend fittings if two fixtures are installed back-to-back or side by side with common drain pipe.
 - a. Straight tees, elbows, and crosses may be used on vent lines.
 - 3. Do not change direction of flow more than 90 degrees.
 - 4. Use proper size of standard increasers and reducers if pipes of different sizes are connected.
 - a. Reducing size of waste piping in direction of flow is prohibited.
- I. Lay buried building waste piping beginning at low point of each system.
 - 1. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream.
 - 2. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
 - 3. Maintain swab in piping and pull past each joint as completed.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- J. Install waste piping at the slope indicated in the Contract Drawings.
 - K. Install cast-iron soil piping in accordance with CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Install encasement on underground piping in accordance with ASTM A674 or AWWA C105/A 21.5.
 - L. Plumbing Specialties:
 - 1. Install backwater valves in sanitary waster gravity-flow piping.
 - a. Comply with requirements for backwater valves specified in Section 221319 "Sanitary Waste Piping Specialties."
 - 2. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers in sanitary waste gravity-flow piping.
 - a. Install cleanout fitting with closure plug inside the building in sanitary drainage force-main piping.
 - b. Comply with requirements for cleanouts specified in Section 221319 "Sanitary Waste Piping Specialties."
 - M. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
 - N. Install sleeves for piping penetrations of walls, ceilings, and floors.
 - 1. Comply with requirements for sleeves specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
 - O. Install sleeve seals for piping penetrations of concrete walls and slabs.
 - 1. Comply with requirements for sleeve seals specified in Section 220517 "Sleeves and Sleeve Seals for Plumbing Piping."
 - P. Install escutcheons for piping penetrations of walls, ceilings, and floors.
 - 1. Comply with requirements for escutcheons specified in Section 220518 "Escutcheons for Plumbing Piping."
- 3.2 JOINT CONSTRUCTION
- A. Hubless, Cast-Iron Soil Piping Coupled Joints:
 - 1. Join hubless, cast-iron soil piping in accordance with CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.
 - B. Threaded Joints: Thread pipe with tapered pipe threads in accordance with ASME B1.20.1.
 - 1. Cut threads full and clean using sharp dies.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

2. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - a. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - b. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
 - c. Do not use pipe sections that have cracked or open welds.
- C. Grooved Joints: Cut groove ends of pipe in accordance with AWWA C606. Lubricate and install gasket over ends of pipes or pipe and fitting. Install coupling housing sections over gasket, with keys seated in piping grooves. Install and tighten housing bolts.
- D. Flanged Joints: Align bolt holes. Select appropriate gasket material, size, type, and thickness. Install gasket concentrically positioned. Use suitable lubricants on bolt threads. Torque bolts in cross pattern.
- E. Install No Hub Fitting Restraints on all piping 4 inch and over in size, shall be provided with supplemental support to minimize the risk of joints separation under high thrust conditions. Auxiliary restraint products used shall be manufactured assemblies with thrust pressure rating adequate for the specific installation. Field devised methods and materials shall not be used to accomplish this application solution.

3.3 INSTALLATION OF HANGERS AND SUPPORTS

- A. Comply with requirements for pipe hanger and support devices and installation specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment".
 1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
 2. Install stainless steel pipe hangers for horizontal piping in corrosive environments.
 3. Install carbon-steel pipe support clamps for vertical piping in noncorrosive environments.
 4. Install stainless steel pipe support clamps for vertical piping in corrosive environments.
 5. Vertical Piping: MSS Type 8 or Type 42 clamps.
 6. Install individual, straight, horizontal piping runs:
 - a. 100 Ft. and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Ft.: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Ft. if Indicated: MSS Type 49, spring cushion rolls.
 7. Multiple, Straight, Horizontal Piping Runs 100 Ft. or Longer: MSS Type 44 pipe rolls. Support pipe rolls on trapeze.
 8. Base of Vertical Piping: MSS Type 52 spring hangers.
- B. Install hangers for cast-iron waste piping, with maximum horizontal spacing and minimum rod diameters, to comply with MSS SP-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.
- C. Support horizontal piping and tubing within 12 inches of each fitting and coupling.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- D. Support vertical runs of cast-iron waste piping to comply with MSS SP-58, locally enforced codes, and authorities having jurisdiction requirements, whichever are most stringent.

3.4 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect waste piping to exterior.
- C. Connect waste piping to the following:
 - 1. Install horizontal backwater valves in accordance with manufacturer's specifications.
 - 2. Comply with requirements for backwater valves specified in Division 22 Section "Sanitary Waste Piping Specialties."
 - 3. Equipment: Connect waste piping as indicated.
 - a. Provide shutoff valve if indicated and union for each connection.
 - b. Use flanges instead of unions for connections NPS 2-1/2 and larger.
- D. Where installing piping adjacent to equipment, allow space for service and maintenance of equipment.
- E. Make connections in accordance with the following unless otherwise indicated:
 - 1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
 - 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.

3.5 IDENTIFICATION

- A. Identify exposed sanitary waste and vent piping.
- B. Comply with requirements for identification specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.6 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
 - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

- D. Test sanitary waste and vent piping in accordance with procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired.
 - a. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
 2. Leave uncovered and unconcealed new, altered, extended, or replaced waste and vent piping until it has been tested and approved.
 - a. Expose work that was covered or concealed before it was tested.
 3. Roughing-in Plumbing Test Procedure: Test waste and vent piping except outside leaders on completion of roughing-in.
 - a. Close openings in piping system and fill with water to point of overflow, but not less than 10 ft. head of water.
 - b. From 15 minutes before inspection starts to completion of inspection, water level must not drop.
 - c. Inspect joints for leaks.
 4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight.
 - a. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg.
 - b. Use U-tube or manometer inserted in trap of water closet to measure this pressure.
 - c. Air pressure must remain constant without introducing additional air throughout period of inspection.
 - d. Inspect plumbing fixture connections for gas and water leaks.
 5. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 6. Prepare reports for tests and required corrective action.
- E. Test force-main piping in accordance with procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved.
 - a. Expose work that was covered or concealed before it was tested.
 2. Cap and subject piping to static-water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials.
 - a. Isolate test source and allow to stand for four hours.
 - b. Leaks and loss in test pressure constitute defects that must be repaired.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

3. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
4. Prepare reports for tests and required corrective action.

3.7 CLEANING AND PROTECTION

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect sanitary waste and vent piping during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.
- D. Repair damage to adjacent materials caused by waste and vent piping installation.

3.8 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
- B. Aboveground, waste piping NPS 4 and smaller are to be any of the following:
 1. Service cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; heavy-duty hubless-piping couplings; and coupled joints.
- C. Aboveground, waste piping NPS 5 and larger are to be any of the following:
 1. Service cast iron, cast-iron soil pipe and fittings; gaskets; and gasketed joints.
 2. Hubless, cast-iron soil pipe and fittings; heavy-duty hubless-piping couplings; and coupled joints.

END OF SECTION

SECTION 22 13 19

SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Backwater valves.
 - 2. Miscellaneous sanitary drainage piping specialties.

1.3 DEFINITIONS

- A. ABS: Acrylonitrile butadiene styrene.
- B. PVC: Polyvinyl chloride.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings:
 - 1. Show fabrication and installation details for frost-resistant vent terminals.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For sanitary waste piping specialties to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTIONS

- A. Sanitary waste piping specialties shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14 for plastic sanitary waste piping specialty components.

2.2 BACKWATER VALVES

A. Horizontal, Cast-Iron Backwater Valves:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Jay R. Smith Mfg Co; a division of Morris Group International.
 - b. Watts Water Technologies; a Watts company.
 - c. Zurn Industries, LLC.
- 2. Standard: ASME A112.14.1.
- 3. Size: Same as connected piping.
- 4. Body: Cast iron.
- 5. Cover: Cast iron with bolted or threaded access check valve.
- 6. End Connections: Hub and spigot or hubless.
- 7. Type Check Valve: Removable, bronze, swing check, factory assembled, or field modified to hang closed.
- 8. Extension: ASTM A74, Service Class; full-size, cast-iron, soil-pipe extension to field-installed cleanout at floor; replaces backwater valve cover.

2.3 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Air-Gap Fittings:

- 1. Standard: ASME A112.1.2, for fitting designed to ensure fixed, positive air gap between installed inlet and outlet piping.
- 2. Body: Bronze or cast iron.
- 3. Inlet: Opening in top of body.
- 4. Outlet: Larger than inlet.
- 5. Size: Same as connected waste piping and with inlet large enough for associated indirect waste piping.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install backwater valves in building drain piping.

CONTRACT NO. 22-522
DIVISION 22 - PLUMBING

1. For interior installation, provide cleanout deck plate flush with floor and centered over backwater valve cover, and of adequate size to remove valve cover for servicing.
- B. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

3.2 PIPING CONNECTIONS

- A. Comply with requirements in Section 221316 "Sanitary Waste and Vent Piping" for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment, to allow service and maintenance.

3.3 LABELING AND IDENTIFYING

- A. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit.
 1. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.4 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION

NO TEXT ON THIS PAGE

SECTION 23 05 00

COMMON WORK RESULTS FOR HVAC

PART 1 -

1.1 RELATED DOCUMENTS

- A. These basic Mechanical Requirements apply to all Division 23000 Sections.
- B. The work of this Section consists of providing of all materials, labor and equipment and the like necessary and/or required for the complete execution of all HVAC and related work for this project, as required by the contract documents.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER RESPECTIVE SECTIONS OF THIS DIVISION

- A. Motor starters shall be furnished under this Division. Refer to Specification Section 230513 "Common motor requirements for HVAC equipment" for technical information.

1.4 REFERENCES

- A. ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers Guides and Standards, latest editions.
- B. SMACNA - Sheet Metal and Air Conditioning Contractors National Association.
- C. ASME - American Society of Mechanical Engineers.
- D. UL - Underwriters Laboratory.
- E. NFPA - National Fire Protection Association.

1.5 REGULATORY REQUIREMENTS

- A. Conform to New York State Building Codes and Energy Code as well as all local codes.
- B. Mechanical: Conform to New York State Mechanical and Plumbing Code.
- C. Obtain permits, and request inspections from authority having jurisdiction.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

1.6 QUALITY ASSURANCE

- A. The Contractor shall have the work indicated on the drawings and/or specified in each section performed by vendors or mechanics experienced and skilled in its implantation or by a “Specialist”, “Specialty Contractor” or “Specialty Subcontractor” under contractual agreement with the Contractor. These terms mean an individual or firm of established reputation, or, if newly organized, whose personnel have previously established a reputation in the same field, which is regularly engaged in, and which maintains a regular force of workmen skilled in either manufacturing or fabricating items required by the Contract, installing items required by the Contract, or otherwise performing work required by the Contract.
- B. Where the Contract Specifications require installation by a "Specialist," that term shall also be deemed to mean either the manufacturer of the item, an individual or firm licensed by the manufacturer, or an individual or firm who will perform such work under the manufacturer's direct supervision.

1.7 PROJECT/SITE CONDITIONS

- A. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- B. Prepare drawings showing proposed arrangement of Work to meet Project conditions, including changes to Work specified in other Sections.

1.8 SCOPE OF WORK

- A. This Contractor shall be responsible for coordinating his work with all other trades.
- B. The Contractor shall provide all materials, labor, equipment, tools, appliances, services, hoisting, scaffolding, supervision and overhead for the furnishing and installing of all mechanical work and related work including but not limited to the following:
 - 1. Demolition of existing work including fans, louvers and miscellaneous equipment.
 - 2. Unit heaters
 - 3. Louvers and dampers
 - 4. Fans.
 - 5. Equipment Supports
 - 6. Automatic temperature controls.
 - 7. Vibration isolation.
 - 8. Equipment supports.
 - 9. Motor starters and disconnects.
 - 10. Protection.
 - 11. Identification.
 - 12. Coordination.
 - 13. Phasing.
 - 14. Rigging.
 - 15. Shop Drawings.
 - 16. As-Built Drawings and Maintenance Manuals.
 - 17. Warrantees.
 - 18. Commissioning

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.1 GENERAL

- A. Construct all apparatus of materials and pressure ratings suitable for the conditions encountered during continuous operation.
- B. Construct all equipment in accordance with requirements of all applicable codes. All pressure vessels and safety devices that fall within the scope of the ASME Code shall conform to the Code and bear the ASME label or stamp.
- C. Match and balance all system components to achieve compatibility of equipment or satisfactory operation and performance throughout the entire operating temperature and control ranges. All installations shall be in accordance with manufacturer's recommendations.
- D. Provide all controls, wiring, piping, valves, accessories and other components necessary to make all systems complete and operable.
- E. The contractor shall warranty all work, including labor and materials, and equipment furnished and installed as part of this contract for a minimum period of year from the date of acceptance by the owner, in writing. Certain equipment, such as underground fuel tanks, may have longer warranties as indicated in the specifications. In such cases the longer of the two warranties shall prevail.

3.2 SHOP DRAWINGS AND SUBMITTALS (COORDINATE WITH DIVISION 01)

- A. Shop drawings and samples shall be prepared and submitted in accordance with the requirements established in the contract and shall consist of all items listed in the following paragraphs.
- B. Manufacturer's data or shop drawings giving full information as to dimensions, materials, and all information pertinent to the adequacy of the submitted equipment shall be submitted for review. Shop drawings shall include, but not be limited to the following:
- C. Submit all Mechanical equipment noted and scheduled on plans including but not limited to the following:
 - 1. Automatic Temperature Controls, Operation Sequences & Wiring Diagrams
 - 2. Motor Starters disconnects and Controllers.
 - 3. Vibration isolation
 - 4. Unit heaters
 - 5. Louvers and dampers
 - 6. Fans
 - 7. Hangers and Inserts
 - 8. Equipment Supports and Vibration Eliminators
 - 9. Coordinated Composite Drawings

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

- D. The contractor shall, upon award, submit a schedule for the engineer's review indicating when each of the above shop drawings shall be submitted. Submittals shall be made in a timely manner as the project progresses in accordance with the Construction manager or General contractor's work schedules. The contractor shall allow sufficient time for the engineers to perform his review. A minimum of 10 business days shall be required. Untimely submittals shall be cause for the owner to make a delay against the contractor.
- E. Demolition, purchase and or installation shall not begin until shop drawings pertaining to the equipment associated with any related portion of the work have been submitted.
- F. Sheet metal shop drawings shall indicate all existing and/or new lights, walls, piping, structural elements, existing work, etc. and dimension locations of ductwork including elevations in relation to these items.
- G. Where shop drawings have been reviewed by the Engineer, such review shall not be considered as a guarantee of measurements or building conditions. Where drawings have been reviewed, said review does not mean that drawings have been checked in detail; said review does not substantiate any quantities and in any way relieve the Contractor from his responsibility nor the necessity of furnishing materials or performing work required by the Contract Drawings and Specifications. It does not relieve the contractor of the responsibility to perform all work to accepted industry standards and in a code compliant manner. Approval of shop drawings containing errors does not relieve the contractor from making corrections at his expense.
- H. Where substitutions are submitted for approval the review shall be for general performance comparison to the specified product. Products shall not be reviewed for size, clearance or coordination with other trades. Coordination with other trades shall be the responsibility of the contractor. And changes to existing conditions or changes required to the work of other trades such as a result of substituted material or equipment approved or not shall be the responsibility of this contractor.
- I. Approval of shop drawings
 - 1. The Contractor shall be specifically responsible for checking equipment dimensions and clearances and confirming that equipment will fit into the designated space and connect properly to adjoining equipment and/or materials.
 - 2. Submittals marked "Make Corrections Noted" give authority to proceed in accordance with the notes. However, if drawings are also marked "Amend and Resubmit", corrected drawings must be resubmitted for final review.
 - 3. Submittals marked "Rejected" do not give authority to proceed with any portion of the work shown there-on. Drawings must be resubmitted.
 - 4. Submittals marked "Rejected" or "Amend and Resubmit" shall include a specific written response to the engineer's comments. Resubmission of a submittal without a written response to the engineer's comments will be considered incomplete and shall be returned un-reviewed.
- J. The contractor shall submit a composite shop drawing layout plan. This shall include all trades including plumbing mechanical and electrical trades. It shall indicate all equipment, piping conduit. It shall include an accurate architectural background. The composite drawing is for

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

contractors and subcontractors to coordinate their work with the work of other trades prior to submitting to the engineer for review and approval. Identify equipment clearances as required for service and maintenance by the manufacture. Indicate conflicts for resolution.

- K. Coordination submittals for equipment within the building shall be made using 3-D software such as AutoCAD and shall include plan view sections and elevations as necessary to full illustrate and evaluate and resolve all structural, piping, major conduit and equipment for conflicts with other trades.

3.3 CODES AND STANDARDS

- A. All equipment and installation methods shall conform to the applicable standards and/or recommendations set forth in the New York State Building Code, Local Codes as well as all Codes and Standards listed in the general requirements sections of the specification.

3.4 FEES & PERMITS

- A. The Contractor shall obtain all permits and pay all fees required related to this scope of work

3.5 PAINTING

- A. All motors, fans and all other factory manufactured, and assembled apparatus shall be factory coated with one coat of primer and one coat of machinery enamel standard color at the factory and after installation, all finishes shall be cleaned and touched up to repair any damage incurred during construction.
- B. All piping shall be painted in colors conforming with OSHA Standards. All new and existing exposed iron and supplementary dunnage steel shall be finished according to specifications.
- C. All supports, nuts, bolts and hanger fasteners located outside shall be galvanized or nickel plated.

3.6 RIGGING

- A. Furnish all labor, materials and equipment required to rig equipment and materials.
- B. The rigger shall secure any necessary permits and comply with all applicable Federal, State and local safety regulations. A copy of permits to be kept at both the project site and Engineer's Office.
- C. The rigger shall have a minimum of five (5) years of practical experience and hold a master riggers license if required.
- D. The procedure for rigging shall be submitted to the Engineer for review. All possible precautions should be taken to prevent damage to the structure, streets, sidewalks, curbs, lawns, etc.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

3.7 CUTTING AND PATCHING

- A. All cutting and patching required for piping, ductwork, control conduits, etc., passing through walls, floors, and roof shall be provided by this Contractor under this contract unless otherwise noted.

3.8 PROTECTION - COORDINATE WITH DIVISION 01

- A. Special protection is required for installation of a Derrick or other device for rigging purposes. This Contractor shall coordinate with the rigger to facilitate rigging work.
- B. Recommendations and Provisions of ANSI Bulletin A10.2 and OSHA shall be complied with in-so-far as applicable to the work.
- C. The Contractor shall provide temporary partitions or tarpaulins to protect adjacent spaces and/or equipment. He shall be responsible for any damage or injury to person or property of any character resulting from any act, omission, neglect or misconduct in his manner or method of executing his work.
- D. The Contractor shall restore at his own expense such property to a condition similar or equal to that existing before such damage or injury in an acceptable manner.
- E. The Contractor, furthermore, shall conduct his operations in such a manner as to prevent dust and debris from transferring on to adjoining property or into existing spaces.
- F. All openings cut in walls, floors, roof or ceilings of the building, for conduit, pipe, ductwork, etc., shall be closed off with box-type temporary protective enclosures of ¼" tempered hardboard, except when mechanics are actually working at the particular opening. Enclosures shall be constructed of fireproof 2x4 frame, four (4) sides covered and made completely dust and watertight.
- G. All finished floor areas through which the contractor must pass with materials or equipment shall be protected with a layer of ¼" hardboard, "Masonite", laid with joints taped together. Roofs shall be protected with ½" plywood

3.9 EQUIPMENT SUPPORTS

- A. A. Provide supplementary steel dunnage, curbs, angle iron stands, etc., to properly set and install all equipment, including supports necessary to properly pitch piping.

3.10 WELDING

- A. Welding and equipment shall conform to the American Welding Society's Code for Welding in Building Construction, latest edition as well as state and local laws and ordinances.
- B. The handling and storage of all welding materials, acetylene and oxygen tanks, burners, and other equipment required for the execution of welding and cutting work shall be subject at all times to the approval of the Owner and/or Architect. All welding materials and gas tanks shall be promptly

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

removed from the premises upon completion of each day's work or stored in a manner satisfactory to the owner. Welding and equipment shall conform to the American Welding Society's Code for Welding in Building Construction, latest edition as well as state and local laws and ordinances.

- C. Provide all temporary ventilation, and ventilation air systems required during welding operations as required by OSHA.

3.11 AS-BUILT DRAWINGS

- A. The Contractor shall provide a complete set of As-Built drawings showing actual installation and locations of all new and existing equipment, piping, and ductwork in the entire building. Schedules shall be revised to indicate actual equipment installed.
- B. As-Built drawings shall be submitted as per contract requirements in accordance with Division 1 and shall be submitted in paper format for review. Accepted as-builts shall then be submitted in AutoCAD format on hard disc.

3.12 CONDITIONS

- A. Inspection: Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence. Verify that the work of this Section may be completed in strict accordance with all pertinent codes and regulations, the approved Shop Drawings, and the Manufacturers' recommendations.
- B. Discrepancies: In the event of discrepancy, immediately notify the Engineer. Do not proceed in areas of discrepancy until all such discrepancies have been fully resolved.

3.13 INSTALLATION OF EQUIPMENT

- A. Locations: Install all equipment in the locations shown on the approved Shop Drawings except where specifically otherwise approved on the job by the Owner and/or Engineer.
- B. Interferences: Avoid interference with structure, and with work of other trades, preserving adequate headroom and clearing all doors and passageways to the approval of the Engineer.
- C. Inspection: Check each piece of equipment in the system for defects, verifying that all parts are properly furnished and installed, and that all items function properly, and that all adjustments have been made.

3.14 CLOSING-IN OF UNINSPECTED WORK

- A. General: Do not allow or cause any of the work to be covered up or enclosed until it has been inspected, tested, and accepted by the Engineer and by all other authorities having jurisdiction.
- B. Uncovering: Should any of the work of this Section be covered up or enclosed before it has been completely inspected, tested, and approved, do all things necessary to uncover all such work.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

After the work has been completely inspected, tested, and approved, provide all materials and labor necessary and make all repairs necessary to restore the work to its original and proper condition at no additional cost to the owner.

3.15 BUILDING ACCESS

- A. The Contractor shall inform himself fully regarding peculiarities and limitations of space available for the passage and installation of all equipment and materials under the Contract.
- B. Verify and coordinate removal of existing construction and/or knock-down of equipment to suit conditions. Special attention should be given to equipment installation. Provide all labor and material to facilitate installation.

3.16 COOPERATION WITH OTHER TRADES PHASING

- A. Cooperate with other trades in order that all systems in the work may be installed in the best arrangements.
- B. Coordinate as required with all other trades to share space in common areas and to provide the maximum of access to each system.
- C. This Contractor shall submit fully coordinated shop drawings showing all piping, ductwork and equipment, as well as relevant work of all other trades such as light, conduits, structural and steel, which may impact the final size or placement of piping, ductwork, equipment, diffusers and grilles.
- D. The work shall be scheduled and phased in accordance with the requirements of the contract and the client. Prior to the commencement of work the HVAC contractor shall submit a schedule in writing to the Architect and owner for approval. There shall be no shutdowns of any systems without prior written approval from the Owner.

3.17 CLEANING

- A. It is the intent of the contract documents that all work, including the inside of equipment be left in a clean condition. All construction dirt shall be removed from material and equipment.
- B. All removed items shall be taken off the premises and discarded in a manner satisfactory to the Owner.

3.18 COMPLETENESS

- A. It is the intent of the contract documents to provide complete systems. Completeness shall mean not only that all material and equipment has been installed properly, but that all material and equipment is installed, adjusted, and operating as per the design intent in the opinion of the Engineer and in accordance with generally accepted industry good practice.

3.19 FIRE PREVENTION DURING HOT WORK

- A. Before starting operations, the Contractor shall furnish trained personnel to provide fire watches for locations where hot work is to be performed. One fire watcher may observe several locations in a relatively small contiguous area. Contractor shall furnish suitable type, fully charged, operable portable fire extinguisher to each fire watcher.
- B. The Contractor shall provide fire watchers who know how to operate the fire extinguisher, how to turn on a fire alarm and how to summon the fire department.
- C. Before starting operations, take suitable precautions to minimize the hazard of a fire communicating to the opposite side of walls, floors, ceilings and roofs from the operations.

3.20 SAFETY MEASURES

- A. Hot work shall not be done in or near rooms or areas where flammable liquids or explosive vapors are present or thought to be present. A combustible gas indicator (explosimeter) test shall be conducted to assure that each area is safe. The Contractor is responsible for arranging and paying for each test.
- B. Insofar as possible, the Contractor shall remove and keep the area free from all combustibles, including rubbish, paper and waste within a radius of 25 feet from hot operations.
- C. If combustible material cannot be removed, the Contractor shall furnish fireproof blankets to cover such materials. At the direction of the owner floors, walls, and ceilings of combustible material shall be wetted thoroughly with water before, during, and after operations sufficiently to afford adequate protection.
- D. Where possible, the Contractor shall furnish and use baffles of metal or gypsum board to prevent the spraying of sparks, hot slag and other hot particles into surrounding combustible material.
- E. The Contractor shall prevent the spread of sparks and particles of hot metal through open windows, doors, and holes and cracks in floors, walls, ceilings and roofs.
- F. Cylinders of gas used in hot work shall be placed a safe distance from the work. The Contractor shall provide hoses and equipment free of deterioration, malfunction and leaks. Suitable supports shall be provided to prevent accidental overturning of cylinders. All cylinder control valves shall be shut off while in use with the gas pressure regulator set at 15 psi or less.
- G. When hot work operations are completed or ended for the day, each location of the days work shall be inspected by the Contractor 30 to 60 minutes after completion of operations to detect for hidden or smoldering fires and to ensure that proper housekeeping is maintained. Contractor shall cleanup the area of work at the end of each shift or workday.
- H. Where sprinkler protection exists, the sprinkler system shall be maintained without interruption while operations are being performed. If operations are performed close to automatic sprinkler heads, gypsum board sheets or damp cloth guards may be used to shield the individual heads temporarily. The heads shall be inspected by the Contractor immediately after hot work operations cease, to ensure all materials have been removed from the heads and that the heads have not been damaged.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

- I. Suitable type, fully charged, operable portable fire extinguisher shall be available at all times during hot work operations.
- J. If any of the above safeguards are not employed, or are violated, the Contracting owners Representative may, by written notice, stop the work until compliance is obtained. Such stoppage shall not relieve the Contractor from performing his work within the Contract period for the Contract price.

3.21 USE OF OWNERS EQUIPMENT

- A. The contractor shall not use any the owner's HVAC system or equipment, new or existing, for any purpose. The contractor shall provide temporary HVAC equipment, ductwork, power, and controls for use during construction for the purpose of ventilation, or heating during the construction process. All such equipment, ductwork, power, and controls shall be removed and the completion of work.

3.22 CLOSEOUT PROCEDURES

- A. General Operating and Maintenance Instructions: Arrange for each installer of operating equipment and other work that requires regular or continuing maintenance, to meet at the site with the Owner's personnel to provide necessary basic instructions in the proper operation and maintenance of the entire Work. Where installers are not expert in the required procedures, include instruction by the manufacturer's representatives.
- B. Where applicable, provide instruction and training, including application of special coatings systems, at manufacturer's recommendation.
- C. Provide a detailed review of the following items:
 - 1. Maintenance manuals
 - 2. Record documents and catalog cuts for each piece of equipment.
 - 3. Spare parts and materials
 - 4. Tools
 - 5. Lubricants
 - 6. Fuels
 - 7. Identification systems
 - 8. Control sequences
 - 9. Hazards
 - 10. Cleaning
- D. Warranties, bonds, maintenance agreements, and similar continuing commitments.
- E. Demonstrate the following procedures:
 - 1. Start-up
 - 2. Shut-down
 - 3. Emergency operations
 - 4. Noise and vibration adjustments
 - 5. Safety procedures
 - 6. Economy and efficiency adjustments
 - 7. Effective energy utilization.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

8. Periodic maintenance

- F. Prepare instruction periods to consist of classroom and or "hands-on" instruction. Provide all equipment including the following:
1. Unit Heaters.

Consult individual equipment specification sections for additional training requirements.

- G. Prepare a written agenda for each session and submit for review and approval. Include date, location, purpose, specific scope, proposed attendance, and session duration.
- H. Record training sessions in digital format, format as selected by the Owner. Turn over digital files to the Owner after training has been completed.

END OF SECTION

SECTION 23 05 13

COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general requirements for single-phase and polyphase, general-purpose, horizontal, small and medium, squirrel-cage induction motors for use on alternating-current power systems up to 600 V and installed at equipment manufacturer's factory or shipped separately by equipment manufacturer for field installation.

1.3 COORDINATION

- A. Coordinate features of motors, installed units, and accessory devices to be compatible with the following:
 - 1. Motor controllers.
 - 2. Torque, speed, and horsepower requirements of the load.
 - 3. Ratings and characteristics of supply circuit and required control sequence.
 - 4. Ambient and environmental conditions of installation location.

1.4 REFERENCES

- A. AFBMA 9 - Load Ratings and Fatigue Life for Ball Bearings.
- B. AFBMA 11 - Load Ratings and Fatigue Life for Roller Bearings.
- C. NEMA MG 1 - Motors and Generators.
- D. NFPA 70 - National Electrical Code.

1.5 REGULATORY REQUIREMENTS

- A. Conform to UL Component Recognition for appropriate sizes.
- B. Conform to NFPA 70 applicable electrical code, Underwriters Laboratories, Inc., and NEMA

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

- C. Conform to New York State energy code.

1.6 DELIVERY, STORAGE, AND PROTECTION

- A. Protect motors stored on site from weather and moisture by maintaining factory covers and suitable weatherproof covering. For extended outdoor storage, remove motors from equipment and store separately.

1.7 WARRANTY

- A. Provide five-year manufacturer warranty for all motors larger than ½ horsepower.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Gould.
 - 2. Century.
 - 3. General Electric.
 - 4. Square D

2.2 GENERAL MOTOR REQUIREMENTS

- A. Comply with NEMA MG 1 unless otherwise indicated.
- B. Comply with IEEE 841 for severe-duty motors.
- C. All electric motors of sizes and types as specified for driving mechanical equipment shall be provided under this section.
- D. Electrical Service: All motors shall be 60 Hertz unless otherwise noted. Refer to Electrical Specifications for required electrical characteristics.
- E. Motors: Design for continuous operation in 40° C environment, and for temperature rise in accordance with ANSI/NEMA MG limits for insulation class, Service Factor, and motor enclosure type. Motors shall be of sufficient size for duty to be performed.
- F. Visible Nameplate: Indicating manufacturer's name and model number, motor horsepower, RPM, frame size, voltage, phase, cycles, full load amps, insulation system class, service factor, maximum ambient temperature, temperature rise at rated horsepower, minimum efficiency, power factor.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

- G. Electrical Connection: Conduit connection boxes, threaded for conduit. For fractional horsepower motors where connection is made directly, provide screwed conduit connection in end frame. Size motor boxes to receive motor feeders and ground cable indicated on electrical drawing schedules.
- H. Duty: Continuous duty at ambient temperature of 40 deg C and at altitude of 3300 feet above sea level.
- I. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.

2.3 MOTOR EFFICIENCY

- A. Electric motors shall meet the minimum efficiency requirement of the following tables in accordance with International Energy conservation code when tested in accordance with DOE CFR 431. Performance data shall be certified by approved testing agency.
- B. Subtype I motors – NEMA premium efficiency as per table NEMA MG 1 table 12-12 and International Energy Conservation code table 405.8(1). This shall apply to general purpose, T-frame, single speed, squirrel cage, induction type; 230/460-V, NEMA Designs A or B, continuous rated, 60 Hz, from 1 to 200 hp, 2-, 4- and 6-pole (3600-, 1800- and 1200-rpm), open and enclosed. Subtype I motors 250 hp to 500 hp motor efficiency shall be able NEMA MG 1 table 12-11 and International Energy Conservation Code table 405.8(1).
- C. Subtype II motors – NEMA efficiency as per table NEMA MG 1 table 12-11 and International Energy Conservation code table 405.8(2). This shall apply to general purpose motors but can configured as U-frame motors; NEMA Design C motors; close-coupled pump motors; footless motors; vertical solid shaft normal thrust motors (as tested in a horizontal position); eight-pole (900 rpm) motors, and polyphase motors with a voltage of not more than 600 V (other than 230 or 460 V).
- D. Minimum average full load efficiency of polyphase small electric motors up to 3 hp shall be in accordance with Table C405.8(3) of the International Energy Conservation Code
- E. Minimum average full load efficiency for capacitor-start, capacitor-run and capacitor-start induction-run small electric motors up to 3 hp shall be in accordance with Table C405.8(4) of the International Energy Conservation Code.

2.4 POLYPHASE MOTORS

- A. Description: NEMA MG 1, Design B, medium induction motor.
- B. Service Factor: 1.15.
- C. Multispeed Motors: Variable torque.
 - 1. For motors with 2:1 speed ratio, consequent pole, single winding.
 - 2. For motors with other than 2:1 speed ratio, separate winding for each speed.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

- D. Multispeed Motors: Separate winding for each speed.
- E. Rotor: Random-wound, squirrel cage.
- F. Bearings: Re-greasable, shielded, antifriction ball bearings suitable for radial and thrust loading. Grease lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication, rated for minimum AFBMA 9, L-10 life of 200,000 hours. Calculate bearing load with NEMA minimum V-belt pulley with belt center line at end of NEMA standard shaft extension. Stamp bearing sizes on nameplate.
- G. Thermistor System (Motor Frame Sizes 254T and Larger): Three PTC thermistors embedded in motor windings and epoxy encapsulated solid state control relay with wiring to terminal box.
- H. Sound Power Levels: To NEMA MG 1.
- I. Temperature Rise: Match insulation rating.
- J. Insulation: Class B or better.
- K. Code Letter Designation:
 - 1. Motors [15] HP and Larger: NEMA starting Code F or Code G.
 - 2. Motors Smaller Than 15 HP: Manufacturer's standard starting characteristic.
- L. Enclosure Material: Cast iron for motor frame sizes 324T and larger; rolled steel for motor frame sizes smaller than 324T.

2.5 ADDITIONAL REQUIREMENTS FOR POLYPHASE MOTORS

- A. Motors Used with Reduced-Voltage and Multispeed Controllers: Match wiring connection requirements for controller with required motor leads. Provide terminals in motor terminal box, suited to control method.
- B. Use part winding Start above 254T Frame Size: Use part of winding to reduce locked rotor starting current to approximately 60 percent of full winding locked rotor current while providing approximately 50 percent of full winding locked rotor torque.
- C. Motors Used with Variable-Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.
 - 1. Windings: Copper magnet wire with moisture-resistant insulation varnish, designed and tested to resist transient spikes, high frequencies, and short time rise pulses produced by pulse-width-modulated inverters.
 - 2. Premium-Efficient Motors: Class B temperature rise; Class F insulation.
 - 3. Inverter-Duty Motors: Class F temperature rise; Class H insulation.
 - 4. Thermal Protection: Comply with NEMA MG 1 requirements for thermally protected motors.
- D. Severe-Duty Motors: Comply with IEEE 841, with 1.15 minimum service factor.

2.6 SINGLE-PHASE MOTORS

- A. Motors larger than 1/20 hp shall be one of the following, to suit starting torque and requirements of specific motor application:
 - 1. Permanent-split capacitor.
 - 2. Split phase.
 - 3. Capacitor start, inductor run.
 - 4. Capacitor start, capacitor run.
- B. Multispeed Motors: Variable-torque, permanent-split-capacitor type.
- C. Bearings: Pre-lubricated, antifriction ball bearings or sleeve bearings suitable for radial and thrust loading.
- D. Motors 1/20 HP and Smaller: Shaded-pole type.
- E. Thermal Protection: Internal protection to automatically open power supply circuit to motor when winding temperature exceeds a safe value calibrated to temperature rating of motor insulation. Thermal-protection device shall automatically reset when motor temperature returns to normal range.
- F. Drip-proof Enclosure: Class A (50 degrees C temperature rise) insulation, NEMA Service Factor, pre-lubricated sleeve ball bearings.

2.7 POWER FACTOR CORRECTION

- A. Provide a capacitor for each three phase, single speed motor rated 3 HP or larger shall be provided to correct the full load power factor to 95%. The capacitor shall be mounted at the motor for connection across the motor terminals by Electrical Contractor
- B. Capacitors:
 - 1. Capacitors shall be totally enclosed, fused and with discharge resistors.
 - 2. Capacitors based on nominal motor RPM shall be provided in accordance with the following table to correct power factor to 95% and verify sizes with motor manufacturer.

Motor HP	Capacitor KVAR	
	3600 RPM Motor	1800 RPM Motor
3	1.5	1.5
5	2	2
7.5	2.5	2.5
10	3	3
15	4	4
20	5	5
25	6	6
30	7	7
40	9	9
50	12	12
60	14	14

2.8 STARTERS

A. GENERAL

1. See specification Section 16485 and Division 1 for additional information.
2. Starters for motors operating at 120 volts shall be manual starters unless otherwise indicated. Starters for motors operating at other than 120 volts shall be magnetic starters.
3. All starters shall be enclosed. Enclosures shall be surface mounted NEMA 1 unless otherwise indicated.
4. Where weatherproof starters are required, the enclosure shall be NEMA 4.
5. It shall be verified that the correct overload heaters have been installed in the starter before energizing any motor. Sizing shall be based on motor nameplate current and taking into account any reduction in current due to power factor correction.
6. Alternate Manufacturers –
 - a. Allen-Bradley
 - b. Crouse-Hinds Co.
 - c. Cutler-Hammer, Inc.
 - d. General Electric Co.
 - e. Square D Co.
 - f. Westinghouse Electric Corp.

B. MANUAL STARTERS

1. Two-pole, toggle operated, thermal overload device in each phase leg, handle guard for padlocking toggle handle and with indicated control and signal devices.
2. Where a motor is controlled automatically by an interlock or pilot device, a “HAND-OFF-AUTO” switch shall be provided in the starter cover. Where the rating of the interlock or pilot device is inadequate to control the motor currents directly, a properly rated contactor shall be provided between the controlling device and the motor.
3. An “ON” pilot light shall be provided in the starter cover.

C. MAGNETIC STARTERS

1. Starters shall be sized in accordance with NEMA standards and the following table except that starters shall not be smaller than NEMA size 0. Starters shall be provided with one N.O. electrical holding interlock, under voltage protection and two additional auxiliary contacts within the same enclosure. NEMA size starters shall be provided as follows

STARTER SIZE	MAX HP AT 460 VOLTS
0	5
1	10
2	25

2. All starters shall be combination type with the starter and disconnect in the same enclosure. All starters shall be Type 2 coordination protected. Fuses shall be Bussman “Low Peak” type or equal sized at 125% of motor nameplate rating. Verify and coordinate requirements for fused disconnect switches with the Electrical Contractor prior to ordering starters.
3. Provide S.S.P.B. or H-O-A switches and pilot light in covers as required to facilitate control operation sequences.

D. CRITICAL FAULT

1. Where starters are not integral to equipment and are furnished and installed separately from equipment by the contractor, provide a 3-phase line voltage monitor by ICM Controls model 450 or approved equal. Unit shall be installed in the motor starter or in a separate enclosure with the same rating as the starter. It shall be arranged to monitor critical faults including phase loss or reversal, and when detected, de-energize the load. It shall monitor non-critical faults including high/low voltage, voltage unbalance and when detected, after a time delay de-energize the load.

PART 3 - EXECUTION

- A. Suitable starting and controlling equipment and devices shall be furnished and installed as specified hereinafter and as shown on the Drawings. The starting equipment shall be arranged, generally, in control groups, or in certain cases, as isolated combination starters as specified or indicated. The Heating Ventilating and Air Conditioning Sequences of Operation, drawings and specifications shall be referred to for the manner of control, operation and monitoring of motors and the electrically operated equipment.
- B. A starter and disconnect switch or combination motor starter disconnect shall be provided for every motor and each and every electrically operated piece of equipment by this contractor except where complete starters and controls are furnished by the manufacturer of the motor or piece of equipment. Starters shall be internally wired to provide the required control operation and monitoring. All control devices such as push buttons, break-glass stations, alternators, relays, pilot lights, etc., shall be provided as required for operation of mechanical equipment. All roof top and remotely located equipment shall have remote starters as located on plan and shall have

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

local disconnect switches. All equipment located in equipment rooms can use combination starters/disconnects located within line of site of controlled equipment. All starters and disconnect switches shall be in enclosures suitable for the environment in which they are installed. Starters and disconnect switches located in machine rooms shall use NEMA 1. Starters and disconnect switches located outdoors shall use NEMA 4x. Starters and disconnect switches located in machine rooms which are subject to potential water damage shall use NEMA 2

- C. Starting equipment and devices specified in this section (and section 23 29 13 Variable Frequency Controllers), shall be furnished by the mechanical subcontractor and shall be installed by the Electrical subcontractor. In general, the mechanical subcontractor shall furnish all motor starters and disconnect switches except where they are an integral part of a motor control center MCC, in this case starters and disconnects shall be provided, (furnished and installed), by the electrical contractor. The mechanical contractor shall provide a separate local disconnect for each motor. The Electrical subcontractor shall also provide all wiring necessary to supply power to the electric motors specified under this section, including connections from the starters to the motors. Starters and disconnects shall also include variable frequency drives. Refer to the electrical plans for equipment which have starters in the MCC.
- D. The mechanical Contractor shall furnish and install all wiring between control devices and controlled equipment furnished under this Section, including interlock control wiring between motor starters, and all automatic temperature control wiring. All wiring shall be installed in conformance with applicable codes and the requirements of the Electrical Division of the Specifications.
- E. The Electrical Contractor shall furnish a 120-volt power source to temperature control panels and equipment requiring a separate 120-volt control power source. Power for control circuits for all devices connecting to motor starters shall be obtained from 120-volt control transformers provided in each starter operating at other than 120 volts. Provide transformers for all low voltage control systems as required.
- F. Furnish detailed composite wiring diagrams and such other information necessary to assure the proper connection, operation and control of motorized equipment, including interlocks, automatic controls, safety controls and all auxiliary circuits.
- G. All control units shall be furnished with a nameplate indicating which device or equipment it controls, the voltage. Additional nameplates on each push button, selector switch and pilot light indicating their functions shall be provided. Nameplates shall be laminated phenolic with white letters on black background, minimum 2” high.
- H. All motors supplied either with equipment or installed separately that are to be used in conjunction with variable frequency drive shall be inverter duty motors.

END OF SECTION

SECTION 23 05 29

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Fastener systems.
 - 2. Equipment supports.
 - 3. Miscellaneous Materials.

1.3 DEFINITIONS

- A. MSS: Manufacturers Standardization Society of The Valve and Fittings Industry Inc.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for HVAC equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
 - 1. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details and include calculations and product data for the following:
 - 1. Equipment supports.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.7 QUALITY ASSURANCE

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 FASTENER SYSTEMS

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Expansion Anchors: Insert-wedge-type, stainless- steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

2.2 EQUIPMENT SUPPORTS

- A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.3 MISCELLANEOUS MATERIALS

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
- B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, non-shrink and nonmetallic grout; suitable for interior and exterior applications.
 - 1. Properties: Non-staining, noncorrosive, and nongaseous.
 - 2. Design Mix: 5000-psi (34.-MPa), 28-day compressive strength.
- C. Flashing:
 - 1. Metal Flashing: 26gage galvanized steel.
 - 2. Metal Counterflashing: 22 gage thick galvanized steel.
 - 3. Flexible Flashing: 47 mil thick sheet butyl or other material compatible with roofing. Verify with roofing manufacturer.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

4. Caps: Steel, 22-gage minimum; 16-gage at fire resistant elements.

D. Sleeves:

1. Ductwork Sleeve 18 gage Installation and Closure for Fire Rated Walls and Floors: Fire damper assembly with continuous angles on all sides as per NFPA-90A requirements.
2. Provide and install sleeves for all penetrations in accordance with Division 1.

E. Escutcheons:

1. Chrome plated cast brass escutcheons with set screws on all exposed piping at wall penetrations in finished spaces.

F. Hanger Rods:

1. Hanger Rods: Hot rolled steel threaded both ends, threaded one end, or continuous threaded. In accordance with the following schedule.

HANGER ROD SIZE SCHEDULE	
Pipe Size (in)	Min Rod Dia (in)
¾" to 2"	3/8"
½" to 3-1/2"	½"
4" to 5"	5/8"
6"	¾"
8" to 12"	7/8"
14"	1"
16" to 18"	1-1/8"
20"	1-1/4"
24"	1-1/2"
30"	1-7/8"

2. Hanger spacing shall be in accordance with the following schedule for maximum allowable distance. Provide hanger all changes in direction.

PIPE SUPPORT SPACING SCHEDULE		
Pipe Material/Size (in)	Maximum Horizontal Spacing (ft)	Maximum Vertical Spacing (ft)
Steel		
Up to 1 ¼"	8	15
1 ½" to 2 ½"	10	15
3" and over	12	15
Copper Pipe	8	10
Copper Tubing		
Up to 1 ¼"	6	10
1 ½" and over	8	10
PVC / HDPE		
Up to 1"	3	10
1 1/4" and over	4	10

2.4 VIBRATION ISOLATION HANGERS

- A. Vibration isolation pipe hangers, pre-compressed and locked at the rated deflection by means of a resilient up-stop to keep the piping or equipment at a fixed elevation during installation. The hangers shall be designed with a release mechanism to free the spring after the installation is complete and the hanger is subjected to its full load. Deflection shall be clearly indicated by means of a scale. Submittals shall include a drawing of the hanger showing the 30° capability. Hangers shall be type PC30N as manufactured by Mason Industries, Inc

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

- A. Fastener System Installation:
 - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches (100mm) thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
 - 2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- B. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- C. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- D. Install hangers and supports to allow controlled thermal movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- E. Install lateral bracing with pipe hangers and supports to prevent swaying.
- F. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- G. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

3.2 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply cold galvanizing-repair paint to comply with ASTM A 780. ZRC cold galvanizing compound

3.6 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports or metal trapeze pipe hangers and metal framing systems and attachments for general service applications.
- F. Use stainless-steel pipe hangers and stainless-steel attachments for hostile environment applications.
- G. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
 - 2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
 - 3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
 - 4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
 - 5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- H. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 - 1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 - 2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
 - 3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
 - 4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
 - 5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
 - 6. C-Clamps (MSS Type 23): For structural shapes.
 - 7. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
 - 8. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
 - 9. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
 - 10. Malleable-Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
 - 11. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
 - a. Light (MSS Type 31): 750 lb.
 - b. Medium (MSS Type 32): 1500 lb.
 - c. Heavy (MSS Type 33): 3000 lb.
 - 12. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

13. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
- I. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
 - J. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
 2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
 3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
 4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
 5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
 6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
 7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
 8. Constant Supports: For critical piping stress and if necessary, to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
 - a. Horizontal (MSS Type 54): Mounted horizontally.
 - b. Vertical (MSS Type 55): Mounted vertically.
 - c. Trapeze (MSS Type 56): Two vertical type supports and one trapeze member.
 9. Install vibration isolation hangers or supports on all piping connected to motor driven equipment for a distance of 20' or the first two hangers.
 - K. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
 - L. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
 - M. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.

CONTRACT NO. 22-522
DIVISION 23 – MECHANICAL

3.7 MISCELLANEOUS:

- A. Equipment bases and supports.
1. Provide housekeeping pads of concrete, minimum 4 inches thick and extending 6 inches beyond supported equipment. Chamfers edges all four side.
 2. Provide templates, anchor bolts, and accessories for mounting and anchoring equipment. Provide for all equipment, pumps, air handling units, etc.
 3. Refer to 23 0548 Vibration controls for HVAC piping and piping and equipment for vibration inertia bases.
 4. Construct supports of steel members. Brace and fasten with flanges bolted to structure. Provide rigid anchors for pipes after vibration isolation components are installed.
- B. Flashing:
1. Provide flexible flashing and metal counterflashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.
 2. Flash piping projecting above finished roof surface with prefabricated steel reinforced boot and counter flashing sleeve.
- C. Sleeves:
1. Sleeves are required for all piping passing through walls and/or slabs. Sleeve diameter to be large enough to accommodate insulated piping.
 2. Sleeves through interior non-fire rated walls are to have annular space between pipe and sleeve filled with materials specified in Division 1.
 3. Sleeves thru fire rated walls to have annular space filled with fire stopping wrapping strips and expanding caulking applied with a caulking gun for a minimum depth of 3” or in another manner suitable for the application as recommended by the manufacturer. See Division 1.
- D. Escutcheons:
1. Provide escutcheons on all wall pipe penetrations that are visible outside MER spaces. All escutcheons shall be chrome plated.

END OF SECTION

SECTION 23 05 53

IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Equipment labels
 - 2. Warning signs and labels.
 - 3. Stencils.
 - 4. Warning tags.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.

1.4 COORDINATION

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- B. Coordinate installation of identifying devices with locations of access panels and doors.

PART 2 - PRODUCTS

2.1 NAMEPLATES, TAGS, MARKERS, ETC

- A. Manufacturer: W.H. Brady Co., Signmark Div
- B. Acceptable manufacturers offering equivalent products
 - 1. Atlantic Engraving Company.

CONTRACT NO. 22-522
DIVISION 23 - MECHANICAL

2. Seton Name Plate Co.
 3. MSI Services
 4. Substitutions as per Contract Requirements.
- C. Description: Nameplates should be as specified in Division 1.

2.3 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
1. Material and Thickness: Brass 0.032-inch, stainless steel 0.025-inch, aluminum, 0.032-inch or anodized aluminum, 0.032-inch minimum thickness, and having predrilled or stamped holes for attachment hardware.
 2. Letter Color: As per ANSI depending on service.
 3. Background Color: As per ANSI depending on service.
 4. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 5. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
 6. Fasteners: Stainless-steel rivets or self-tapping screws.
 7. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Plastic Labels for Equipment:
1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
 2. Letter Color: As per ANSI depending on service.
 3. Background Color: As per ANSI depending on service.
 4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
 5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-quarters the size of principal lettering.
 7. Fasteners: Stainless-steel rivets or self-tapping screws.
 8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- C. Label Content: Include equipment's Drawing designation or unique equipment number, drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.
- D. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

CONTRACT NO. 22-522
DIVISION 23 - MECHANICAL

2.4 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/8 inch thick, and having predrilled holes for attachment hardware.
- B. Letter Color: White.
- C. Background Color: Black.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/2 inch for name of units if viewing distance is less than 3 feet. For everything else the lettering shall be no less than 1"
- G. Fasteners: Stainless-steel rivets or self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.5 WARNING TAGS

- A. Warning Tags: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.
 - 1. Size: 1-1/2" letters minimum.
 - 2. Fasteners: Brass grommet and wire.
 - 3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
 - 4. Color: Yellow background with black lettering.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents and incompatible primers, paints and encapsulants.

3.2 WARNING-TAG INSTALLATION

- A. Write require message on and attach warning tags to equipment and other items where required.

CONTRACT NO. 22-522
DIVISION 23 - MECHANICAL

3.3 INSTALLATION

- A. Install tags, markers, etc. in conformance with Division 01.
- B. Unless otherwise indicated, color shall conform with ANSI/ASME A13.1.
- C. Install identifying devices after completion of coverings and painting.
- D. Install plastic nameplates with corrosive-resistance mechanical fasteners or adhesive.
- E. Install labels with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
- F. Install tags using corrosion resistant chain. Number tags consecutively by location.
- G. Identify all equipment with nameplates or metal tags.
- H. Identify control panels and major control components outside panels with nameplates.
- I. Tag automatic controls, instruments, and relays.
- J. Provide permanent labels for all controls and limits which state function of each control and control set-points.

END OF SECTION

SECTION 23 82 39.16
PROPELLER UNIT HEATERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes propeller unit heaters with electric coils.

1.3 DEFINITIONS

- A. CWP: Cold working pressure.
- B. PTFE: Polytetrafluoroethylene plastic.
- C. TFE: Tetrafluoroethylene plastic.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include rated capacities, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings:
 - 1. Include plans, elevations, sections, and details.
 - 2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 3. Include location and size of each field connection.
 - 4. Include details of anchorages and attachments to structure and to supported equipment.
 - 5. Include equipment schedules to indicate rated capacities, operating characteristics, furnished specialties, and accessories.
 - 6. Indicate location and arrangement of integral controls.
 - 7. Wiring Diagrams: Power, signal, and control wiring.

CONTRACT NO. 22-522
DIVISION 23 - MECHANICAL

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Floor plans and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Suspended ceiling components.
 - 2. Structural members to which propeller unit heaters will be attached.
 - 3. Method of attaching hangers to building structure.
 - 4. Size and location of initial access modules for acoustical tile.
 - 5. Items penetrating finished ceiling, including the following:
 - a. Lighting fixtures.
 - b. Other equipment
- B. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For propeller unit heaters to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products shall be one of the following:
 - 1. QMark
 - 2. Sterling
 - 3. Modine
 - 4. Vulcan

2.2 DESCRIPTION

- A. Assembly including casing, coil, fan, and motor in vertical and/or horizontal discharge configuration as scheduled with adjustable discharge louvers.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Electric propeller unit heaters shall comply with UL 2021
- D. Explosion-proof electric propeller unit heaters shall comply with UL 823.

2.3 PERFORMANCE REQUIREMENTS

- A. ASHRAE/IESNA 90.1 Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."

CONTRACT NO. 22-522
DIVISION 23 - MECHANICAL

2.4 HOUSINGS

- A. Finish: Manufacturer's standard baked enamel applied to factory-assembled and -tested propeller unit heaters before shipping.
- B. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.
- C. Discharge Louver: Adjustable fin diffuser for horizontal units and conical diffuser for vertical units.

2.5 FAN AND MOTOR

- A. Fan: Propeller type with aluminum wheel directly mounted on motor shaft in the fan venturi.
- B. Motor: Permanently lubricated, multispeed. Comply with requirements in Section 230513 "Common Motor Requirements for HVAC Equipment."

2.6 CONTROLS

- A. Control Devices:
 - 1. Wall-mounted, fan-speed switch, and thermostat by BMS contractor.

2.7 CAPACITIES AND CHARACTERISTICS

- A. Heating Capacity are as scheduled or noted on plans.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive propeller unit heaters for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for electrical connections to verify actual locations before unit-heater installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install propeller unit heaters to comply with NFPA 90A.
- B. Install propeller unit heaters level.

CONTRACT NO. 22-522
DIVISION 23 - MECHANICAL

- C. Suspend propeller unit heaters from structure with all-thread hanger rods and elastomeric hangers or spring hangers. Hanger rods and attachments to structure are specified in Section 230529 "Hangers and Supports for HVAC Piping and Equipment."
- D. Install wall-mounted thermostats and switch controls in electrical outlet boxes at heights to match lighting controls. Verify location of thermostats and other exposed control sensors with Drawings and room details before installation.

3.3 CONNECTIONS

- A. Ground according to Division 26 Section "Grounding and Bonding for Electrical Systems."
- B. Wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests:
 - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
 - 2. Operate electric heating elements through each stage to verify proper operation and electrical connections.
 - 3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.
- B. Units will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.5 ADJUSTING

- A. Adjust initial temperature set points.
- B. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.6 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain propeller unit heaters.

END OF SECTION

NO TEXT ON THIS PAGE

SECTION 26 05 19

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Building wires and cables rated 600 V and less.
 - 2. Connectors, splices, and terminations rated 600 V and less.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Belden Inc.
 - 2. General Cable; General Cable Corporation.
 - 3. Service Wire Co.
 - 4. Southwire Company.
- B. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- C. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THHN/THWN-2, and Type XHHW-2.

2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. 3M.
 2. Hubbell Power Systems, Inc.
 3. ILSCO.
 4. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
 5. Tyco Electronics Corp.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type XHHW-2, single conductors in raceway
- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway, Mineral-insulated, metal-sheathed cable, Type MI.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- D. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.
- E. Exposed Branch Circuits, Including in Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- F. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway, Metal-clad cable, Type MC.
- G. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type XHHW-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members and follow surface contours where possible.
- F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- C. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

3.8 FIELD QUALITY CONTROL

- A. Engage a qualified testing agency to perform tests and inspections.
- B. Perform the following tests and inspections:
 1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 3. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in conductors No. 3 AWG and larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.
 - a. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.
 - b. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- c. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

- C. Test and Inspection Reports: Prepare a written report to record the following:
 - 1. Procedures used.
 - 2. Results that comply with requirements.
 - 3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

- D. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes grounding and bonding systems and equipment, plus the following special applications:
 - 1. Underground distribution grounding.
 - 2. Foundation steel electrodes.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency and testing agency's field supervisor.
- B. Field quality-control reports.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
 - 1. Testing Agency's Field Supervisor: Certified by NETA to supervise on-site testing.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
1. Burndy; Part of Hubbell Electrical Systems.
 2. ERICO International Corporation.
 3. Harger Lightning & Grounding.
 4. ILSCO.
 5. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business

2.2 SYSTEM DESCRIPTION

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

2.3 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
1. Solid Conductors: ASTM B 3.
 2. Stranded Conductors: ASTM B 8.
 3. Tinned Conductors: ASTM B 33.
 4. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 5. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
 6. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- C. Grounding Bus: Predrilled rectangular bars of annealed copper, 1/4 by 4 inches in cross section, with 9/32-inch holes spaced 1-1/8 inches apart. Stand-off insulators for mounting shall comply with UL 891 for use in switchboards, 600 V and shall be Lexan or PVC, impulse tested at 5000 V.

2.4 CONNECTORS

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- D. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

2.5 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 5/8 by 96 inches.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.
 - 1. Bury at least 24 inches below grade.
- C. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
 - 1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
 - 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.
- D. Conductor Terminations and Connections:
 - 1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 - 2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
 - 3. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.
- C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields according to written instructions by manufacturer of splicing and termination kits.
- D. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

3.4 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- C. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- D. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.
- E. Metallic Fences: Comply with requirements of IEEE C2.
 - 1. Grounding Conductor: Bare, tinned copper, not less than No. 8 AWG.
 - 2. Gates: Shall be bonded to the grounding conductor with a flexible bonding jumper.
 - 3. Barbed Wire: Strands shall be bonded to the grounding conductor.

3.5 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- B. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least two rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
- C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- D. Grounding and Bonding for Piping:
 - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
 - 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 - 3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- E. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install tinned bonding jumper to bond across flexible duct connections to achieve continuity.
- F. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart.
- G. Concrete-Encased Grounding Electrode (Ufer Ground): Fabricate according to NFPA 70; use a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.
 - 1. If concrete foundation is less than 20 feet long, coil excess conductor within base of foundation.
 - 2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
- B. Tests and Inspections:
 - 1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - 2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 - 3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at individual ground rods. Make tests at ground rods before any conductors are connected.
 - a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
- C. Grounding system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Report measured ground resistances that exceed the following values:
 - 1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
 - 2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
 - 3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
 - 4. Manhole Grounds: 10 ohms.
- F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION

SECTION 26 05 29

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Hangers and supports for electrical equipment and systems.
 2. Construction requirements for concrete bases.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Hangers.
 - b. Steel slotted support systems.
 - c. Trapeze hangers.
 - d. Clamps.
 - e. Turnbuckles.
 - f. Sockets.
 - g. Eye nuts.
 - h. Saddles.
 - i. Brackets.
 2. Include rated capacities and furnished specialties and accessories.
- B. Delegated-Design Submittal: For hangers and supports for electrical systems.
1. Include design calculations and details of trapeze hangers.

1.3 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M.
 2. AWS D1.2/D1.2M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design hanger and support system.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4 factory-fabricated components for field assembly.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Allied Tube & Conduit.
 - b. Cooper B-Line, Inc.; a division of Cooper Industries.
 - c. ERICO International Corporation.
 - d. GS Metals Corp.
 - e. Thomas & Betts Corporation, A Member of the ABB Group.
 - f. Unistrut; an Atkore International company.
 - 2. Material: Galvanized steel.
 - 3. Channel Width: 1-5/8 inches.
 - 4. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
 - 5. Channel Dimensions: Selected for applicable load criteria.
- B. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M steel plates, shapes, and bars; black and galvanized.
- E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
 - 1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Hilti, Inc.
 - 2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 3) MKT Fastening, LLC.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- 4) Simpson Strong-Tie Co., Inc.
2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
 - a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1) Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2) Empire Tool and Manufacturing Co., Inc.
 - 3) Hilti, Inc.
 - 4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
 - 5) MKT Fastening, LLC.
3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Section 055000 "Metal Fabrications" for steel shapes and plates.

PART 3 - EXECUTION

3.1 APPLICATION

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems unless requirements in this Section are stricter.
- B. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."
- C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMTs, IMCs, and RMCs as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- D. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
 1. Secure raceways and cables to these supports with two-bolt conduit clamps.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- E. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMTs, IMCs, and RMCs may be supported by openings through structure members, according to NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
 - 1. To Wood: Fasten with lag screws or through bolts.
 - 2. To New Concrete: Bolt to concrete inserts.
 - 3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
 - 4. To Existing Concrete: Expansion anchor fasteners.
 - 5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
 - 6. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
 - 7. To Light Steel: Sheet metal screws.
 - 8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Comply with installation requirements in Section 055000 "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 3000-psi, 28-day compressive-strength concrete. Concrete materials, reinforcement, and placement requirements are specified in Section 033000 "Cast-in-Place Concrete."
- C. Anchor equipment to concrete base as follows:
 - 1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor bolts to elevations required for proper attachment to supported equipment.
 - 3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.5 PAINTING

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Metal wireways and auxiliary gutters.
3. Surface raceways.
4. Boxes, enclosures, and cabinets.
5. Handholes and boxes for exterior underground cabling.

B. Related Requirements:

1. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.
2. Section 270528 "Pathways for Communications Systems" for conduits, wireways, surface pathways, innerduct, boxes, faceplate adapters, enclosures, cabinets, and handholes serving communications systems.
3. Section 280528 "Pathways for Electronic Safety and Security" for conduits, surface pathways, innerduct, boxes, and faceplate adapters serving electronic safety and security.

1.2 DEFINITIONS

- A. GRC: Galvanized rigid steel conduit.
- B. IMC: Intermediate metal conduit.

1.3 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.
- B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:
 1. Structural members in paths of conduit groups with common supports.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

2. HVAC and plumbing items and architectural features in paths of conduit groups with common supports.
- B. Source quality-control reports.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. AFC Cable Systems, Inc.
 2. Allied Tube & Conduit.
 3. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
 4. Republic Conduit.
 5. Robroy Industries.
 6. Southwire Company.
 7. Thomas & Betts Corporation, A Member of the ABB Group.
- B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. GRC: Comply with ANSI C80.1 and UL 6.
- D. IMC: Comply with ANSI C80.6 and UL 1242.
- E. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
1. Comply with NEMA RN 1.
 2. Coating Thickness: 0.040 inch, minimum.
- F. EMT: Comply with ANSI C80.3 and UL 797.
- G. FMC: Comply with UL 1; zinc-coated steel.
- H. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- I. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
 2. Fittings for EMT:
 - a. Material: Steel.
 - b. Type: compression.
 3. Expansion Fittings: Steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
 4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- J. Joint Compound for IMC or GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 METAL WIREWAYS AND AUXILIARY GUTTERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper B-Line, Inc.; a division of Cooper Industries.
 - 2. Hoffman; a brand of Pentair Equipment Protection.
 - 3. Square D.
- B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 unless otherwise indicated, and sized according to NFPA 70.
 - 1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Wireway Covers: Hinged type unless otherwise indicated.
- E. Finish: Manufacturer's standard enamel finish.

2.3 SURFACE RACEWAYS

- A. Listing and Labeling: Surface raceways and tele-power poles shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Surface Metal Raceways: Galvanized steel with snap-on covers complying with UL 5. Manufacturer's standard enamel finish in color selected by Architect.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Hubbell Incorporated; Wiring Device-Kellems.
 - b. MonoSystems, Inc.
 - c. Wiremold / Legrand.

2.4 BOXES, ENCLOSURES, AND CABINETS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper Technologies Company.
 - 2. Hoffman; a brand of Pentair Equipment Protection.
 - 3. Hubbell Incorporated.
 - 4. MonoSystems, Inc.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

5. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
 6. Robroy Industries.
- B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- E. Metal Floor Boxes:
1. Material: Cast metal.
 2. Type: Fully adjustable .
 3. Shape: Rectangular.
 4. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- F. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- G. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb.
1. Listing and Labeling: Paddle fan outlet boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- H. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- I. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.
- J. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- K. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.
- L. Gangable boxes are allowed.
- M. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.
- N. Cabinets:
1. NEMA 250, Type 1 galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
 2. Hinged door in front cover with flush latch and concealed hinge.
 3. Key latch to match panelboards.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.

2.5 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. General Requirements for Handholes and Boxes:
1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
 2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carson Industries LLC.
 - b. Oldcastle Precast, Inc.
 - c. Quazite: Hubbell Power Systems, Inc.
 2. Standard: Comply with SCTE 77.
 3. Configuration: Designed for flush burial with closed bottom unless otherwise indicated.
 4. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
 5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 6. Cover Legend: Molded lettering, "ELECTRIC."
 7. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
 8. Handholes 12 Inches Wide by 24 Inches Long or Larger as noted on contract drawings: Have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.6 SOURCE QUALITY CONTROL FOR UNDERGROUND ENCLOSURES

- A. Handhole and Pull-Box Prototype Test: Test prototypes of handholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
1. Tests of materials shall be performed by an independent testing agency.
 2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
 3. Testing machine pressure gages shall have current calibration certification complying with ISO 9000 and ISO 10012 and traceable to NIST standards.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed Conduit: GRC.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

2. Concealed Conduit, Aboveground: GRC IMC EMT.
 3. Underground Service Conduit: HDPE.
 4. Underground Conduit: GRC.
 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 6. Boxes and Enclosures, Aboveground: NEMA 250, Type 4.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed, Not Subject to Physical Damage: EMT.
 2. Exposed, Not Subject to Severe Physical Damage: EMT.
 3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:
 - a. Loading dock.
 - b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
 - c. Mechanical rooms.
 - d. Boiler Room
 - e. Crawl Space.
 4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
 6. Damp or Wet Locations: GRC.
 7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in kitchens and damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
 3. EMT: Use compression, steel or cast-metal fittings. Comply with NEMA FB 2.10.
 4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Install surface raceways only where indicated on Drawings.

3.2 INSTALLATION

- A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.
- D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.
- E. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
- H. Support conduit within 12 inches of enclosures to which attached.
- I. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
 - 4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.
- J. Stub-ups to Above Recessed Ceilings:
 - 1. Use EMT, IMC, or RMC for raceways.
 - 2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- K. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- L. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- M. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.
- N. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- O. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- P. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.
- Q. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.
- R. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- S. Surface Raceways:
 - 1. Install surface raceway with a minimum 2-inch radius control at bend points.
 - 2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.
- T. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.
- U. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
 - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 - 2. Where an underground service raceway enters a building or structure.
 - 3. Where otherwise required by NFPA 70.
- V. Comply with manufacturer's written instructions for solvent welding RNC and fittings.
- W. Expansion-Joint Fittings:
 - 1.
 - 2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:
 - a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
 - b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
 - c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
 - d. Attics: 135 deg F temperature change.
 - 3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
 - 4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
 - 5. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- X. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
 - 1. Use LFMC in damp or wet locations subject to severe physical damage.
 - 2. Use LFMC in damp or wet locations not subject to severe physical damage.
- Y. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.
- Z. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.
- AA. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- BB. Locate boxes so that cover or plate will not span different building finishes.
- CC. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.
- DD. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- EE. Set metal floor boxes level and flush with finished floor surface.
- FF. Set nonmetallic floor boxes level. Trim after installation to fit flush with finished floor surface.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

- A. Direct-Buried Conduit:
 - 1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Section 312000 "Earth Moving" for pipe less than 6 inches in nominal diameter.
 - 2. Install backfill as specified in Section 312000 "Earth Moving."
 - 3. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction as specified in Section 312000 "Earth Moving."
 - 4. Install manufactured duct elbows for stub-ups at poles and equipment and at building entrances through floor unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
 - 5. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through floor.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
- 6. Warning Planks: Bury warning planks approximately 12 inches above direct-buried conduits but a minimum of 6 inches below grade. Align planks along centerline of conduit.
- 7. Underground Warning Tape: Comply with requirements in Section 260553 "Identification for Electrical Systems."

3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.
- D. Install handholes with bottom below frost line, below grade.
- E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables but short enough to preserve adequate working clearances in enclosure.
- F. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

3.5 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.6 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies. Comply with requirements in Section 078413 "Penetration Firestopping."

3.7 PROTECTION

- A. Protect coatings, finishes, and cabinets from damage and deterioration.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 26 05 43

UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Direct-buried conduit, ducts, and duct accessories.
2. Concrete-encased conduit, ducts, and duct accessories.
3. Handholes and boxes.
4. Manholes.

1.2 DEFINITIONS

- A. Trafficways: Locations where vehicular or pedestrian traffic is a normal course of events.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include duct-bank materials, including separators and miscellaneous components.
2. Include ducts and conduits and their accessories, including elbows, end bells, bends, fittings, and solvent cement.
3. Include accessories for manholes, handholes, boxes, and other utility structures.
4. Include warning tape.
5. Include warning planks.

B. Shop Drawings:

1. Precast or Factory-Fabricated Underground Utility Structures:
 - a. Include plans, elevations, sections, details, attachments to other work, and accessories.
 - b. Include duct entry provisions, including locations and duct sizes.
 - c. Include reinforcement details.
 - d. Include frame and cover design and manhole frame support rings.
 - e. Include Ladder details.
 - f. Include grounding details.
 - g. Include dimensioned locations of cable rack inserts, pulling-in and lifting irons, and sumps.
 - h. Include joint details.
2. Factory-Fabricated Handholes and Boxes Other Than Precast Concrete:
 - a. Include dimensioned plans, sections, and elevations, and fabrication and installation details.
 - b. Include duct entry provisions, including locations and duct sizes.
 - c. Include cover design.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- d. Include grounding details.
- e. Include dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

1.4 INFORMATIONAL SUBMITTALS

- A. Duct-Bank Coordination Drawings: Show duct profiles and coordination with other utilities and underground structures.
 - 1. Include plans and sections, drawn to scale, and show bends and locations of expansion fittings.
 - 2. Drawings shall be signed and sealed by a qualified professional engineer.
- B. Product Certificates: For concrete and steel used in precast concrete manholes and handholes, as required by ASTM C 858.
- C. Qualification Data: For professional engineer and testing agency responsible for testing nonconcrete handholes and boxes.
- D. Source quality-control reports.
- E. Field quality-control reports.

1.5 MAINTENANCE MATERIALS SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
- B. Furnish cable-support stanchions, arms, insulators, and associated fasteners in quantities equal to 5 percent of quantity of each item installed.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

1.7 FIELD CONDITIONS

- A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions, and then only after arranging to provide temporary electrical service according to requirements indicated:
 - 1. Notify Construction Manager and Owner no fewer than seven days in advance of proposed interruption of electrical service.
 - 2. Do not proceed with interruption of electrical service without Construction Manager's written permission.
- B. Ground Water: Assume ground-water level is at grade level unless a lower water table is noted on Drawings.

- C. Ground Water: Assume ground-water level is 36 inches below ground surface unless a higher water table is noted on Drawings.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR DUCTS AND RACEWAYS

- A. Comply with ANSI C2.

2.2 CONDUIT

- A. Rigid Steel Conduit: Galvanized. Comply with ANSI C80.1.
- B. HPDE – per utility requirements.

2.3 PRECAST CONCRETE HANDHOLES AND BOXES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Christy Concrete Products.
 2. Riverton Concrete Products.
 3. Utility Concrete Products, LLC.
 4. Utility Vault Co.
- B. Comply with ASTM C 858 for design and manufacturing processes.
- C. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of handhole or box.
 1. Frame and Cover: Weatherproof cast-iron frame, with cast-iron cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.
 2. Frame and Cover: Weatherproof steel frame, with steel cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.
 3. Frame and Cover: Weatherproof steel frame, with hinged steel access door assembly with tamper-resistant, captive, cover-securing bolts.
 - a. Cover Hinges: Concealed, with hold-open ratchet assembly.
 - b. Cover Handle: Recessed.
 4. Frame and Cover: Weatherproof aluminum frame with hinged aluminum access door assembly with tamper-resistant, captive, cover-securing bolts.
 - a. Cover Hinges: Concealed, with hold-open ratchet assembly.
 - b. Cover Handle: Recessed.
 5. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 6. Cover Legend: Molded lettering, "ELECTRIC."
 7. Configuration: Units shall be designed for flush burial and have closed bottom unless otherwise indicated.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

8. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.
 - a. Extension shall provide increased depth of 12 inches.
 - b. Slab: Same dimensions as bottom of enclosure, and arranged to provide closure.
9. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.
10. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks, plus an additional 12 inches vertically and horizontally to accommodate alignment variations.
 - a. Windows shall be located no less than 6 inches from interior surfaces of walls, floors, or frames and covers of handholes, but close enough to corners to facilitate racking of cables on walls.
 - b. Window opening shall have cast-in-place, welded-wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
 - c. Window openings shall be framed with at least two additional No. 3 steel reinforcing bars in concrete around each opening.
11. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
 - a. Type and size shall match fittings to duct or conduit to be terminated.
 - b. Fittings shall align with elevations of approaching ducts and be located near interior corners of handholes to facilitate racking of cable.
12. Handholes 12 inches wide by 24 inches long and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.4 HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

- A. General Requirements for Handholes and Boxes: Comply with SCTE 77. Comply with tier requirements in "Underground Enclosure Application" Article.
 1. Color: Green.
 2. Configuration: Units shall be designed for flush burial and have closed bottom unless otherwise indicated.
 3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
 4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 5. Cover Legend: Molded lettering, "ELECTRIC."
 6. Direct-Buried Wiring Entrance Provisions: Knockouts equipped with insulated bushings or end-bell fittings, selected to suit box material, sized for wiring indicated, and arranged for secure, fixed installation in enclosure wall.
 7. Duct Entrance Provisions: Duct-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.
 8. Handholes 12 inches wide by 24 inches long and larger shall have factory-installed inserts for cable racks and pulling-in irons.
- B. Polymer Concrete Handholes and Boxes with Polymer Concrete Cover: Molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- a. Armorcast Products Company.
 - b. Carson Industries LLC.
 - c. Quazite: Hubbell Power Systems, Inc.
- C. Fiberglass Handholes and Boxes with Polymer Concrete Frame and Cover: Sheet-molded, fiberglass-reinforced, polyester resin enclosure joined to polymer concrete top ring or frame.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Armorcast Products Company.
 - b. Carson Industries LLC.
 - c. Christy Concrete Products.
 - d. Quazite: Hubbell Power Systems, Inc.
- D. Fiberglass Handholes and Boxes: Molded of fiberglass-reinforced polyester resin, with covers made of polymer concrete.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carson Industries LLC.
 - b. Christy Concrete Products.
 - c. Nordic Fiberglass, Inc.
 - d. Quazite: Hubbell Power Systems, Inc.

2.5 PRECAST MANHOLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Christy Concrete Products.
 2. Riverton Concrete Products.
 3. Utility Concrete Products, LLC.
 4. Utility Vault Co.
- B. Comply with ASTM C 858.
- C. Structural Design Loading: Comply with requirements in "Underground Enclosure Application" Article.
- D. Precast Manholes: One-piece units and units with interlocking mating sections, complete with accessories, hardware, and features.
- E. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks, plus an additional 12 inches vertically and horizontally to accommodate alignment variations.
1. Windows shall be located no less than 6 inches from interior surfaces of walls, floors, or roofs of manholes, but close enough to corners to facilitate racking of cables on walls.
 2. Window opening shall have cast-in-place, welded-wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.
 3. Window openings shall be framed with at least two additional No. 3 steel reinforcing bars in concrete around each opening.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- F. Duct Entrances in Manhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.
 - 1. Type and size shall match fittings to duct or conduit to be terminated.
 - 2. Fittings shall align with elevations of approaching ducts and be located near interior corners of manholes to facilitate racking of cable.
- G. Concrete Knockout Panels: 1-1/2 to 2 inches thick, for future conduit entrance and sleeve for ground rod.
- H. Ground Rod Sleeve: Provide a 3-inch PVC conduit sleeve in manhole floors 2 inches from the wall adjacent to, but not underneath, the ducts routed from the facility.
- I. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

2.6 CAST-IN-PLACE MANHOLES

- A. Description: Underground utility structures, constructed in place, complete with accessories, hardware, and features. Include concrete knockout panels for conduit entrance and sleeve for ground rod.
- B. Materials: Comply with ASTM C 858 and with Section 033000 "Cast-in-Place Concrete."
- C. Structural Design Loading: As specified in "Underground Enclosure Application" Article.

2.7 SOURCE QUALITY CONTROL

- A. Test and inspect precast concrete utility structures according to ASTM C 1037.
- B. Nonconcrete Handhole and Pull-Box Prototype Test: Test prototypes of manholes and boxes for compliance with SCTE 77. Strength tests shall be for specified tier ratings of products supplied.
 - 1. Tests of materials shall be performed by an independent testing agency.
 - 2. Strength tests of complete boxes and covers shall be by either an independent testing agency or manufacturer. A qualified registered professional engineer shall certify tests by manufacturer.
 - 3. Testing machine pressure gages shall have current calibration certification, complying with ISO 9000 and ISO 10012, and traceable to NIST standards.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate layout and installation of ducts, manholes, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify Architect if there is a conflict between areas of excavation and existing structures or

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

archaeological sites to remain. Coordinate all site work with Site Contractor and Civil Engineer.

- B. Coordinate elevations of ducts and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of ducts and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct runs drain to manholes and handholes, and as approved by Architect.
- C. Clear and grub vegetation to be removed, and protect vegetation to remain according to Section 311000 "Site Clearing." Remove and stockpile topsoil for reapplication according to Section 310000 "Earthwork."

3.2 UNDERGROUND DUCT APPLICATION

- A. Ducts for Electrical Service Feeders 600 V and Less: HDPE in concrete-encased duct bank unless otherwise indicated.
- B. Ducts for Electrical Feeders 600 V and Less: RGS in direct-buried duct bank unless otherwise indicated.
- C. Ducts for Electrical Branch Circuits: RGS direct buried.
- D. Underground Ducts Crossing Driveways and Roadways: RGS, NEMA Type EPC-40-PVC, encased in reinforced concrete.

3.3 UNDERGROUND ENCLOSURE APPLICATION

- A. Handholes and Boxes for 600 V and Less:
 - 1. Units in Roadways and Other Deliberate Traffic Paths: Precast concrete, AASHTO HB 17, H-20 structural load rating.
 - 2. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Precast concrete, AASHTO H-20 or Polymer concrete, SCTE 77, Tier 15 structural load rating.
 - 3. Units in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Precast concrete, AASHTO HB 17, H-10 Polymer concrete units, SCTE 77, Tier 8 structural load rating.
 - 4. Units Subject to Light-Duty Pedestrian Traffic Only: Fiberglass-reinforced polyester resin, structurally tested according to SCTE 77 with 3000-lbf vertical loading.
 - 5. Cover design load shall not exceed the design load of the handhole or box.
- B. Manholes: Precast or cast-in-place concrete.
 - 1. Units Located in Roadways and Other Deliberate Traffic Paths by Heavy or Medium Vehicles: H-20 structural load rating according to AASHTO HB 17.
 - 2. Units Not Located in Deliberate Traffic Paths by Heavy or Medium Vehicles: H-10 load rating according to AASHTO HB 17.

3.4 EARTHWORK

- A. Excavation and Backfill: Comply with Section 312000 "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.
- B. Restore surface features at areas disturbed by excavation, and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
- C. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Section 329200 "Turf and Grasses" and Section 329300 "Plants."
- D. Cut and patch existing pavement in the path of underground ducts and utility structures according to the "Cutting and Patching" Article in Section 017300 "Execution."

3.5 DUCT INSTALLATION

- A. Install ducts according to NEMA TCB 2.
- B. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes, to drain in both directions.
- C. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches both horizontally and vertically, at other locations unless otherwise indicated.
- D. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.
- E. Installation Adjacent to High-Temperature Steam Lines: Where duct banks are installed parallel to underground steam lines, perform calculations showing the duct bank will not be subject to environmental temperatures above 40 deg C. Where environmental temperatures are calculated to rise above 40 deg C, and anywhere the duct bank crosses above an underground steam line, install insulation blankets listed for direct burial to isolate the duct bank from the steam line.
- F. Duct Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches o.c. for 5-inch ducts, and vary proportionately for other duct sizes.
 - 1. Begin change from regular spacing to end-bell spacing 10 feet from the end bell without reducing duct line slope and without forming a trap in the line.
 - 2. Direct-Buried Duct Banks: Install an expansion and deflection fitting in each conduit in the area of disturbed earth adjacent to manhole or handhole. Install an expansion fitting near the center of all straight line direct-buried duct banks with calculated expansion of more than 3/4 inch.
 - 3. Grout end bells into structure walls from both sides to provide watertight entrances.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- G. Building Wall Penetrations: Make a transition from underground duct to rigid steel conduit at least 10 feet outside the building wall, without reducing duct line slope away from the building, and without forming a trap in the line. Use fittings manufactured for duct-to-conduit transition. Install conduit penetrations of building walls as specified in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."
- H. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.
- I. Pulling Cord: Install 100-lbf- test nylon cord in empty ducts.
- J. Concrete-Encased Ducts: Support ducts on duct separators.
 - 1. Excavate trench bottom to provide firm and uniform support for duct bank. Prepare trench bottoms as specified in Section 312000 "Earth Moving" for pipes less than 6 inches in nominal diameter.
 - 2. Width: Excavate trench 12 inches wider than duct bank on each side.
 - 3. Width: Excavate trench 3 inches wider than duct bank on each side.
 - 4. Depth: Install top of duct bank at least 24 inches below finished grade in areas not subject to deliberate traffic, and at least 30 inches below finished grade in deliberate traffic paths for vehicles unless otherwise indicated.
 - 5. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
 - 6. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, with not less than four spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent floating during concreting. Stagger separators approximately 6 inches between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
 - 7. Minimum Space between Ducts: 3 inches between ducts and exterior envelope wall, 2 inches between ducts for like services, and 4 inches between power and signal ducts.
 - 8. Elbows: Use manufactured duct elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run unless otherwise indicated. Extend concrete encasement throughout length of elbow.
 - 9. Elbows: Use manufactured rigid steel conduit elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
 - b. Stub-Ups to Equipment: For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of base. Install insulated grounding bushings on terminations at equipment.
 - 10. Reinforcement: Reinforce concrete-encased duct banks where they cross disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.
 - 11. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.
 - 12. Concrete Cover: Install a minimum of 3 inches of concrete cover at top and bottom, and a minimum of 2 inches on each side of duct bank.
 - 13. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- a. Start at one end and finish at the other, allowing for expansion and contraction of ducts as their temperature changes during and after the pour. Use expansion fittings installed according to manufacturer's written recommendations, or use other specific measures to prevent expansion-contraction damage.
 - b. If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch reinforcing-rod dowels extending a minimum of 18 inches into concrete on both sides of joint near corners of envelope.
14. Pouring Concrete: Comply with requirements in "Concrete Placement" Article in Section 033000 "Cast-in-Place Concrete." Place concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.

K. Direct-Buried Duct Banks:

1. Excavate trench bottom to provide firm and uniform support for duct bank. Comply with requirements in Section 312000 "Earth Moving" for preparation of trench bottoms for pipes less than 6 inches in nominal diameter.
2. Support ducts on duct separators coordinated with duct size, duct spacing, and outdoor temperature.
3. Space separators close enough to prevent sagging and deforming of ducts, with not less than four spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger spacers approximately 6 inches between tiers.
4. Depth: Install top of duct bank at least 36 inches below finished grade unless otherwise indicated.
5. Set elevation of bottom of duct bank below frost line.
6. Install ducts with a minimum of 3 inches between ducts for like services and 6 inches between power and signal ducts.
7. Elbows: Install manufactured duct elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run unless otherwise indicated. Encase elbows for stub-up ducts throughout length of elbow.
8. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment, at building entrances through floor, and at changes of direction in duct run.
 - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete.
 - b. For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation. Install insulated grounding bushings on terminations at equipment.
9. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand place backfill to 4 inches over ducts and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction. Comply with requirements in Section 312000 "Earth Moving" for installation of backfill materials.
 - a. Place minimum 3 inches of sand as a bed for duct bank. Place sand to a minimum of 6 inches above top level of duct bank.

- b. Place minimum 6 inches of engineered fill above concrete encasement of duct bank.
- L. Warning Planks: Bury warning planks approximately 12 inches above direct-buried ducts and duct banks, placing them 24 inches o.c. Align planks along the width and along the centerline of duct bank. Provide an additional plank for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional planks 12 inches apart, horizontally.
- M. Warning Tape: Bury warning tape approximately 12 inches above all concrete-encased ducts and duct banks. Align tape parallel to and within 3 inches of centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally.

3.6 INSTALLATION OF CONCRETE MANHOLES, HANDHOLES, AND BOXES

- A. Cast-in-Place Manhole Installation:
 - 1. Finish interior surfaces with a smooth-troweled finish.
 - 2. Windows for Future Duct Connections: Form and pour concrete knockout panels 1-1/2 to 2 inches thick, arranged as indicated.
 - 3. Comply with requirements in Section 033000 "Cast-in-Place Concrete" for cast-in-place concrete, formwork, and reinforcement.
- B. Precast Concrete Handhole and Manhole Installation:
 - 1. Comply with ASTM C 891 unless otherwise indicated.
 - 2. Install units level and plumb and with orientation and depth coordinated with connecting ducts, to minimize bends and deflections required for proper entrances.
 - 3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevations:
 - 1. Manhole Roof: Install with rooftop at least 15 inches below finished grade.
 - 2. Manhole Frame: In paved areas and trafficways, set frames flush with finished grade. Set other manhole frames 1 inch above finished grade.
 - 3. Install handholes with bottom below frost line, below grade.
 - 4. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch above finished grade.
 - 5. Where indicated, cast handhole cover frame integrally with handhole structure.
- D. Drainage: Install drains in bottom of manholes where indicated. Coordinate with drainage provisions indicated.
- E. Manhole Access: Circular opening in manhole roof; sized to match cover size.
 - 1. Manholes with Fixed Ladders: Offset access opening from manhole centerlines to align with ladder.
 - 2. Install chimney, constructed of precast concrete collars and rings, to support cast-iron frame to connect cover with manhole roof opening. Provide moisture-tight masonry joints and waterproof grouting for frame to chimney.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- F. Waterproofing: Apply waterproofing to exterior surfaces of manholes and handholes after concrete has cured at least three days. Waterproofing materials and installation are specified in Section 071353 "Elastomeric Sheet Waterproofing." After ducts have been connected and grouted, and before backfilling, waterproof joints and connections, and touch up abrasions and scars. Waterproof exterior of manhole chimneys after mortar has cured at least three days.
- G. Dampproofing: Apply dampproofing to exterior surfaces of manholes and handholes after concrete has cured at least three days. Dampproofing materials and installation are specified in Section 071113 "Bituminous Dampproofing." After ducts are connected and grouted, and before backfilling, dampproof joints and connections, and touch up abrasions and scars. Dampproof exterior of manhole chimneys after mortar has cured at least three days.
- H. Hardware: Install removable hardware, including pulling eyes, cable stanchions, and cable arms as required for installation and support of cables and conductors and as indicated.
- I. Fixed Manhole Ladders: Arrange to provide for safe entry with maximum clearance from cables and other items in manholes.
- J. Field-Installed Bolting Anchors in Manholes and Concrete Handholes: Do not drill deeper than 3-7/8 inches for manholes and 2 inches for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

3.7 INSTALLATION OF HANDHOLES AND BOXES OTHER THAN PRECAST CONCRETE

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting ducts, to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of ducts, and seal joint between box and extension as recommended by manufacturer.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas and trafficways, set cover flush with finished grade. Set covers of other handholes 1 inch above finished grade.
- D. Install handholes and boxes with bottom below frost line, below grade.
- E. Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in enclosure.
- F. Field cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.
- G. For enclosures installed in asphalt paving and subject to occasional, nondeliberate, heavy-vehicle loading, form and pour a concrete ring encircling, and in contact with, enclosure and

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

with top surface screeded to top of box cover frame. Bottom of ring shall rest on compacted earth.

1. Concrete: 3000 psi, 28-day strength, complying with Section 033000 "Cast-in-Place Concrete," with a troweled finish.
2. Dimensions: 10 inches wide by 12 inches deep.

3.8 GROUNDING

- A. Ground underground ducts and utility structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

3.9 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections and prepare test reports:
 1. Demonstrate capability and compliance with requirements on completion of installation of underground ducts and utility structures.
 2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide a minimum 6-inch- long mandrel equal to 80 percent fill of duct. If obstructions are indicated, remove obstructions and retest.
 3. Test manhole and handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Correct deficiencies and retest as specified above to demonstrate compliance.

3.10 CLEANING

- A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of ducts. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.
- B. Clean internal surfaces of manholes, including sump. Remove foreign material.

END OF SECTION

SECTION 26 05 44

SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 SLEEVES

A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

- B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

- C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

- D. Molded-PVC Sleeves: With nailing flange for attaching to wooden forms.

- E. Molded-PE or -PP Sleeves: Removable, tapered-cup shaped, and smooth outer surface with nailing flange for attaching to wooden forms.

- F. Sleeves for Rectangular Openings:

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

1. Material: Galvanized sheet steel.
2. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
 - b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

2.2 SLEEVE-SEAL SYSTEMS

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Advance Products & Systems, Inc.
 - b. CALPICO, Inc.
 - c. Metraflex Company (The).
 - d. Pipeline Seal and Insulator, Inc.
 - e. Proco Products, Inc.
 2. Sealing Elements: EPDM rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
 3. Pressure Plates: Plastic.
 4. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

2.3 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for embedding in concrete slab or wall. Unit shall have plastic or rubber waterstop collar with center opening to match piping OD.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. HOLDRITE.

2.4 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.5 SILICONE SEALANTS

- A. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below.
 - 1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.
- B. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
 - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
 - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."
 - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
 - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
 - 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
 - 5. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inches above finished floor level. Install sleeves during erection of floors.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
 - 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
 - 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel or cast-iron pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION

SECTION 26 05 53

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Identification for raceways.
 2. Identification of power and control cables.
 3. Identification for conductors.
 4. Underground-line warning tape.
 5. Warning labels and signs.
 6. Instruction signs.
 7. Equipment identification labels, including arc-flash warning labels.
 8. Miscellaneous identification products.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for electrical identification products.
- B. Samples: For each type of label and sign to illustrate composition, size, colors, lettering style, mounting provisions, and graphic features of identification products.
- C. Identification Schedule: For each piece of electrical equipment and electrical system components to be an index of nomenclature for electrical equipment and system components used in identification signs and labels. Use same designations indicated on Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Comply with ASME A13.1 and IEEE C2.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 COLOR AND LEGEND REQUIREMENTS

- A. Raceways and Cables Carrying Circuits at 600 V or Less:
 - 1. Black letters on an orange field.
 - 2. Legend: Indicate voltage and system or service type.
- B. Raceways and Cables Carrying Circuits at More Than 600 V:
 - 1. Black letters on an orange field.
 - 2. Legend: "DANGER - CONCEALED HIGH VOLTAGE WIRING."
- C. Warning labels and signs shall include, but are not limited to, the following legends:
 - 1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
 - 2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.3 LABELS

- A. Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. emedco.
 - c. LEM Products Inc.
 - d. Marking Services, Inc.
 - e. Panduit Corp.
- B. Snap-Around Labels for Raceways and Cables Carrying Circuits at 600 V or Less: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters of raceways they identify, and that stay in place by gripping action.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Marking Services, Inc.
 - c. Panduit Corp.
 - d. Seton Identification Products.

2.4 TAPES AND STENCILS:

- A. Underground-Line Warning Tape
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- a. Brady Corporation.
 - b. LEM Products Inc.
 - c. Marking Services, Inc.
 - d. Reef Industries, Inc.
 - e. Seton Identification Products.
2. Tape:
- a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
 - b. Printing on tape shall be permanent and shall not be damaged by burial operations.
 - c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.
3. Color and Printing:
- a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
 - b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
 - c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE."

2.5 Tags

- A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.
- B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.015 inch thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Carlton Industries, LP.
 - c. LEM Products Inc.
 - d. Marking Services, Inc.
 - e. Panduit Corp.
 - f. Seton Identification Products.
- C. Write-On Tags:
1. Polyester Tags: 0.010 inch 0.015 inch Insert dimension thick, with corrosion-resistant grommet and cable tie for attachment to raceway, conductor, or cable.
 2. Marker for Tags: Permanent, waterproof, black ink marker recommended by tag manufacturer.
 3. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.6 Signs

- A. Baked-Enamel Signs:
1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

2. 1/4-inch grommets in corners for mounting.
3. Nominal Size: 7 by 10 inches.

B. Metal-Backed Butyrate Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396-inch galvanized-steel backing and with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal Size: 10 by 14 inches.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Brady Corporation.
 - b. Champion America.
 - c. emedco.

C. Laminated Acrylic or Melamine Plastic Signs:

1. Engraved legend.
2. Thickness:
 - a. For signs up to 20 sq. inches, minimum 1/16-inch-.
 - b. For signs larger than 20 sq. inches, 1/8 inch thick.
 - c. Engraved legend with black letters on white face.
 - d. Punched or drilled for mechanical fasteners.
 - e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.7 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F according to ASTM D 638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black, except where used for color-coding.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F according to ASTM D 638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black.

C. Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, self-locking.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F according to ASTM D 638: 7000 psi.
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 deg F.
5. Color: Black.

2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).
- B. Fasteners for Labels and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 INSTALLATION

- A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.
- B. Install identifying devices before installing acoustical ceilings and similar concealment.
- C. Verify identity of each item before installing identification products.
- D. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.
- E. Apply identification devices to surfaces that require finish after completing finish work.
- F. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- G. Attach plastic raceway and cable labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.
- H. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:
 - 1. Outdoors: UV-stabilized nylon.
 - 2. In Spaces Handling Environmental Air: Plenum rated.
- I. Painted Identification: Comply with requirements in painting Sections for surface preparation and paint application.

- J. Aluminum Wraparound Marker Labels and Metal Tags: Secure tight to surface of conductor or cable at a location with high visibility and accessibility.
- K. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- L. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 8 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches overall.

3.3 IDENTIFICATION SCHEDULE

- A. Concealed Raceways, Duct Banks, More Than 600 V, within Buildings: Tape and stencil 4-inch- wide black stripes on 10-inch centers over orange background that extends full length of raceway or duct and is 12 inches wide. Stencil legend "DANGER CONCEALED HIGH VOLTAGE WIRING" with 3-inch- high black letters on 20-inch centers. Stop stripes at legends. Apply stripes to the following finished surfaces:
 - 1. Floor surface directly above conduits running beneath and within 12 inches of a floor that is in contact with earth or is framed above unexcavated space.
 - 2. Wall surfaces directly external to raceways concealed within wall.
 - 3. Accessible surfaces of concrete envelope around raceways in vertical shafts, exposed in the building, or concealed above suspended ceilings.
- B. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30A and 120V to Ground: Identify with self-adhesive vinyl tape applied in bands. Install labels at 10-foot maximum intervals.
- C. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels containing the wiring system legend and system voltage. System legends shall be as follows:
 - 1. "EMERGENCY POWER."
 - 2. "POWER."
- D. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
 - 1. Color-Coding for Phase- and Voltage-Level Identification, 600 V or Less: Use colors listed below for ungrounded service feeder and branch-circuit conductors.
 - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
 - b. Colors for 208/120-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Phase C: Blue.
 - c. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- E. Install instructional sign, including the color code for grounded and ungrounded conductors using adhesive-film-type labels.
- F. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use write-on tags with the conductor or cable designation, origin, and destination.
- G. Control-Circuit Conductor Termination Identification: For identification at terminations, provide heat-shrink preprinted tubes with the conductor designation.
- H. Conductors To Be Extended in the Future: Attach write-on tags to conductors and list source.
- I. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
 - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
 - 2. Use system of marker-tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
 - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.
- J. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.
 - 1. Limit use of underground-line warning tape to direct-buried cables.
 - 2. Install underground-line warning tape for direct-buried cables and cables in raceways.
- K. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall comply with NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- L. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Metal-backed, butyrate warning signs.
 - 1. Comply with 29 CFR 1910.145.
 - 2. Identify system voltage with black letters on an orange background.
 - 3. Apply to exterior of door, cover, or other access.
 - 4. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:
 - a. Power-transfer switches.
 - b. Controls with external control power connections.
- M. Arc Flash Warning Labeling: Self-adhesive thermal transfer vinyl labels.
 - 1. Comply with NFPA 70E and ANSI Z535.4.
 - 2. Comply with Section 260574 "Overcurrent Protective Device Arc-Flash Study" requirements for arc-flash warning labels.
- N. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- O. Emergency Operating Instruction Signs: Install instruction signs with white legend on a red background with minimum 3/8-inch- high letters for emergency instructions at equipment used for power transfer.

- P. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm unless equipment is provided with its own identification.
 - 1. Labeling Instructions:
 - a. Indoor Equipment: Engraved, laminated acrylic or melamine plastic label, punched or drilled for mechanical fasteners. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.
 - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label Stenciled legend 4 inches high.
 - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
 - d. Unless labels are provided with self-adhesive means of attachment, fasten them with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
 - 2. Equipment To Be Labeled:
 - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be in the form of an engraved, laminated acrylic or melamine label.
 - b. Enclosures and electrical cabinets.
 - c. Access doors and panels for concealed electrical items.
 - d. Switchboards.
 - e. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
 - f. Emergency system boxes and enclosures.
 - g. Enclosed switches.
 - h. Enclosed circuit breakers.
 - i. Enclosed controllers.
 - j. Variable-speed controllers.
 - k. Push-button stations.
 - l. Power-transfer equipment.
 - m. Contactors.
 - n. Remote-controlled switches, dimmer modules, and control devices.
 - o. Battery-inverter units.
 - p. Battery racks.
 - q. Power-generating units.
 - r. Monitoring and control equipment.

END OF SECTION

SECTION 26 09 23

LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Time switches.
2. Photoelectric switches.
3. Standalone daylight-harvesting switching and dimming controls.
4. Indoor occupancy and vacancy sensors.
5. Switchbox-mounted occupancy sensors.
6. Digital timer light switches.
7. Outdoor motion sensors.

B. Related Requirements:

1. Section 262726 "Wiring Devices" for wall-box dimmers, non-networkable wall-switch occupancy sensors, and manual light switches.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Show installation details for the following:
 - a. Occupancy sensors.
 - b. Vacancy sensors.
2. Interconnection diagrams showing field-installed wiring.
3. Include diagrams for power, signal, and control wiring.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

B. Sample Warranty: For manufacturer's warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For each type of lighting control device to include in operation and maintenance manuals.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On USB media. Provide names, versions, and website addresses for locations of installed software.
3. Device address list.
4. Printout of software application and graphic screens.

1.5 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace lighting control devices that fail(s) in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
 - a. Faulty operation of lighting control software.
 - b. Faulty operation of lighting control devices.
2. Warranty Period: Two year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 INDOOR OCCUPANCY AND VACANCY SENSORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Acuity Brands.

B. General Requirements for Sensors:

1. Wall or Ceiling-mounted, solid-state indoor occupancy and vacancy sensors.
2. Dual technology.
3. Integrated power pack.
4. Hardwired connection to switch ; and BAS and lighting control system.
5. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
6. Operation:
 - a. Occupancy Sensor: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
 - b. Vacancy Sensor: Unless otherwise indicated, lights are manually turned on and sensor turns lights off when the room is unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
 - c. Combination Sensor: Unless otherwise indicated, sensor shall be programmed to turn lights on when coverage area is occupied and turn them off when unoccupied,

or to turn off lights that have been manually turned on; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.

7. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A Sensor is powered from the power pack Wireless.
 8. Power: Line voltage.
 9. Power Pack: Dry contacts rated for 20-A LED load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Sensor has 24-V dc, 150-mA, Class 2 power source, as defined by NFPA 70.
 10. Mounting:
 - a. Sensor: Suitable for mounting in any position on a standard outlet box.
 - b. Relay: Externally mounted through a 1/2-inch knockout in a standard electrical enclosure.
 - c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
 11. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.
 12. Bypass Switch: Override the "on" function in case of sensor failure.
 13. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; turn lights off when selected lighting level is present.
- C. Dual-Technology Type: Wall or Ceiling mounted; detect occupants in coverage area using PIR and ultrasonic detection methods. The particular technology or combination of technologies that control on-off functions is selectable in the field by operating controls on unit.
1. Sensitivity Adjustment: Separate for each sensing technology.
 2. Detector Sensitivity: Detect occurrences of 6-inch- minimum movement of any portion of a human body that presents a target of not less than 36 sq. in., and detect a person of average size and weight moving not less than 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
 3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. when mounted on a 96-inch- high ceiling.
 4. Detection Coverage (Room, Wall Mounted): Detect occupancy anywhere within a 180-degree pattern centered on the sensor over an area of 2000 square feet when mounted 48 inches above finished floor.

2.2 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 1. Acuity Brands.
- B. General Requirements for Sensors: Automatic-wall-switch occupancy sensor with manual on-off switch, suitable for mounting in a single gang switchbox, with provisions for connection to BAS using hardwired connection.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Occupancy Sensor Operation: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn lights off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
3. Operating Ambient Conditions: Dry interior conditions, 32 to 120 deg F.
4. Switch Rating: Not less than 800-VA LED load at 120 V, 1200-VA LED load at 277 V, and 800-W incandescent.

C. Wall-Switch Sensor Tag WS1:

1. Standard Range: 180-degree field of view, field adjustable from 180 to 40 degrees; with a minimum coverage area of 2100 sq. ft.
2. Sensing Technology: Dual technology - PIR and ultrasonic.
3. Switch Type: SP, manual "on," automatic "off" or SP, field-selectable automatic "on," or manual "on," automatic "off."
4. Capable of controlling load in three-way application.
5. Voltage: Match the circuit voltage.
6. Ambient-Light Override: Concealed, field-adjustable, light-level sensor from 10 to 150 fc. The switch prevents the lights from turning on when the light level is higher than the set point of the sensor.
7. Concealed, field, "off" time-delay selector at up to 30 minutes.
8. Concealed, "off" time-delay selector at 30 seconds and 5, 10, and 20 minutes.
9. Adaptive Technology: Self-adjusting circuitry detects and memorizes usage patterns of the space and helps eliminate false "off" switching.
10. Color: as specified by architect.
11. Faceplate: Color matched to switch.
12. WattStopper; a Legrand® Group brand.

2.3 DIGITAL TIMER LIGHT SWITCH

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Acuity Brands.

B. Description: Combination digital timer and conventional switch lighting control unit. Switchbox-mounted, backlit LCD display, with selectable time interval in 20 minute increments.

1. Rated 960 W at 120-V ac for tungsten lighting, 10 A at 120-V ac or 10 amps at 277-V ac for LED, and 1/4 horsepower at 120-V ac.
2. Integral relay for connection to BAS.
3. Voltage: Dual voltage - 120 and 277 V.
4. Color: As selected by Architect..
5. Faceplate: Color matched to switch.

2.4 HIGH-BAY OCCUPANCY SENSORS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Acuity Brands.
- B. Description: Solid-state unit. The unit is designed to operate with the lamp and ballasts indicated.
 - 1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - 2. Operation: Turn lights on when coverage area is occupied, and to half-power when unoccupied; with a time delay for turning lights to half-power that is adjustable over a minimum range of 1 to 16 minutes.
 - 3. Continuous Lamp Monitoring: When lamps are dimmed continuously for 24 hours, automatically turn lamps on to full power for 15 minutes for every 24 hours of continuous dimming.
 - 4. Power: Line voltage.
 - 5. Operating Ambient Conditions: 32 to 149 deg F.
 - 6. Mounting: Threaded pipe.
 - 7. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
 - 8. Detector Technology: PIR.
 - 9. Power and dimming control from the luminaire ballast that has been modified to include the dimming capacitor.
- C. Detector Coverage: User selectable by interchangeable PIR lenses, suitable for mounting heights from 12 to 50 feet.
- D. Accessories: Obtain manufacturer's installation and maintenance kit with laser alignment tool for sensor positioning and power port connectors.

2.5 CONDUCTORS AND CABLES

- A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 18 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- C. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 14 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine lighting control devices before installation. Reject lighting control devices that are wet, moisture damaged, or mold damaged.
- B. Examine walls and ceilings for suitable conditions where lighting control devices will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SENSOR INSTALLATION

- A. Comply with NECA 1.
- B. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.
- C. Install and aim sensors in locations to achieve not less than 90-percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.3 CONTACTOR INSTALLATION

- A. Comply with NECA 1.
- B. Mount electrically held lighting contactors with elastomeric isolator pads to eliminate structure-borne vibration unless contactors are installed in an enclosure with factory-installed vibration isolators.

3.4 WIRING INSTALLATION

- A. Comply with NECA 1.
- B. Wiring Method: Comply with Section 260519 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 3/4 inch.
- C. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- D. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- E. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.5 IDENTIFICATION

- A. Identify components and power and control wiring according to Section 260553 "Identification for Electrical Systems."
 - 1. Identify controlled circuits in lighting contactors.
 - 2. Identify circuits or luminaires controlled by photoelectric and occupancy sensors at each sensor.
- B. Label time switches and contactors with a unique designation.

3.6 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
 - 1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Lighting control devices will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.7 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting lighting control devices to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
 - 1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.
 - 2. For daylighting controls, adjust set points and deadband controls to suit Owner's operations.
 - 3. Align high-bay occupancy sensors using manufacturer's laser aiming tool.

3.8 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.
- B. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

1. Upgrade Notice: At least 30 days to allow Owner to schedule and access the system and to upgrade computer equipment if necessary.

3.9 DEMONSTRATION

- A. Coordinate demonstration of products specified in this Section with demonstration requirements for low-voltage, programmable lighting control systems specified in Section 260943.16 "Addressable-Luminaire Lighting Controls" and Section 260943.23 "Relay-Based Lighting Controls."
- B. Train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION

SECTION 26 22 13

LOW-VOLTAGE DISTRIBUTION TRANSFORMERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes distribution, dry-type transformers with a nominal primary and secondary rating of 600 V and less, with capacities up to 1500 kVA.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type and size of transformer.
 - 2. Include rated nameplate data, capacities, weights, dimensions, minimum clearances, installed devices and features, and performance for each type and size of transformer.
- B. Shop Drawings:
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 - 2. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment.
 - 3. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Source quality-control reports.
- B. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For transformers to include in emergency, operation, and maintenance manuals.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: On receipt, inspect for and note any shipping damage to packaging and transformer.
 - 1. If manufacturer packaging is removed for inspection, and transformer will be stored after inspection, re-package transformer using original or new packaging materials that provide protection equivalent to manufacturer's packaging.
- B. Storage: Store in a warm, dry, and temperature-stable location in original shipping packaging.
- C. Temporary Heating: Apply temporary heat according to manufacturer's written instructions within the enclosure of each ventilated-type unit, throughout periods during which equipment is not energized and when transformer is not in a space that is continuously under normal control of temperature and humidity.
- D. Handling: Follow manufacturer's instructions for lifting and transporting transformers.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Eaton.
 - 2. General Electric Company.
 - 3. Square D; by Schneider Electric.
- B. Source Limitations: Obtain each transformer type from single source from single manufacturer.

2.2 GENERAL TRANSFORMER REQUIREMENTS

- A. Description: Factory-assembled and -tested, air-cooled units for 60-Hz service.
- B. Comply with NFPA 70.
 - 1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
- C. Transformers Rated 15 kVA and Larger:
 - 1. Comply with 10 CFR 431 (DOE 2016) efficiency levels.
 - 2. Marked as compliant with DOE 2016 efficiency levels by an NRTL.
- D. Shipping Restraints: Paint or otherwise color-code bolts, wedges, blocks, and other restraints that are to be removed after installation and before energizing. Use fluorescent colors that are easily identifiable inside the transformer enclosure.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

2.3 DISTRIBUTION TRANSFORMERS

- A. Comply with NFPA 70, and list and label as complying with UL 1561.
- B. Cores: Electrical grade, non-aging silicon steel with high permeability and low hysteresis losses.
 - 1. One leg per phase.
 - 2. Core volume shall allow efficient transformer operation at 10 percent above the nominal tap voltage.
 - 3. Grounded to enclosure.
- C. Coils: Continuous windings without splices except for taps.
 - 1. Coil Material: Aluminum.
 - 2. Internal Coil Connections: Brazed or pressure type.
 - 3. Terminal Connections: Bolted.
- D. Enclosure: Ventilated.
 - 1. NEMA 250, Type 2: Core and coil shall be encapsulated within resin compound using a vacuum-pressure impregnation process to seal out moisture and air.
 - 2. KVA Ratings: Based on convection cooling only and not relying on auxiliary fans.
 - 3. Wiring Compartment: Sized for conduit entry and wiring installation.
 - 4. Finish: Comply with NEMA 250.
 - a. Finish Color: Gray weather-resistant enamel.
 - 5. .
- E. Taps for Transformers 3 kVA and Smaller: None.
- F. Taps for Transformers 7.5 to 24 kVA: Two 5 percent taps below rated voltage.
- G. Taps for Transformers 25 kVA and Larger: Two 2.5 percent taps above and two 2.5 percent taps below normal full capacity.
- H. Insulation Class, Smaller Than 30 kVA: 180 deg C, UL-component-recognized insulation system with a maximum of 115 deg C rise above 40 deg C ambient temperature.
- I. Insulation Class, 30 kVA and Larger: 220 deg C, UL-component-recognized insulation system with a maximum of 150 deg C rise above 40 deg C ambient temperature.
- J. Grounding: Provide ground-bar kit or a ground bar installed on the inside of the transformer enclosure.

2.4 IDENTIFICATION

- A. Nameplates: Engraved, laminated-acrylic or melamine plastic signs for each distribution transformer, mounted with corrosion-resistant screws. Nameplates and label products are specified in Section 260553 "Identification for Electrical Systems."

2.5 SOURCE QUALITY CONTROL

- A. Test and inspect transformers according to IEEE C57.12.01 and IEEE C57.12.91.
 - 1. Resistance measurements of all windings at rated voltage connections and at all tap connections.
 - 2. Ratio tests at rated voltage connections and at all tap connections.
 - 3. Phase relation and polarity tests at rated voltage connections.
 - 4. No load losses, and excitation current and rated voltage at rated voltage connections.
 - 5. Impedance and load losses at rated current and rated frequency at rated voltage connections.
 - 6. Applied and induced tensile tests.
 - 7. Regulation and efficiency at rated load and voltage.
 - 8. Insulation-Resistance Tests:
 - a. High-voltage to ground.
 - b. Low-voltage to ground.
 - c. High-voltage to low-voltage.
 - 9. Temperature tests.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions for compliance with enclosure- and ambient-temperature requirements for each transformer.
- B. Verify that field measurements are as needed to maintain working clearances required by NFPA 70 and manufacturer's written instructions.
- C. Examine walls, floors, roofs, and concrete bases for suitable mounting conditions where transformers will be installed.
- D. Verify that ground connections are in place and requirements in Section 260526 "Grounding and Bonding for Electrical Systems" have been met. Maximum ground resistance shall be 5 ohms at location of transformer.
- E. Environment: Enclosures shall be rated for the environment in which they are located. Covers for NEMA 250, Type 4X enclosures shall not cause accessibility problems.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install transformers level and plumb on a concrete base with vibration-dampening supports.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- B. Construct concrete bases according to Section 033000 "Cast-in-Place Concrete" and anchor floor-mounted transformers according to manufacturer's written instructions and requirements in Section 260529 "Hangers and Supports for Electrical Systems."
 - 1. Coordinate size and location of concrete bases with actual transformer provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified with concrete.
- C. Secure transformer to concrete base according to manufacturer's written instructions.
- D. Secure covers to enclosure and tighten all bolts to manufacturer-recommended torques to reduce noise generation.
- E. Remove shipping bolts, blocking, and wedges.

3.3 CONNECTIONS

- A. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."
- B. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- D. Provide flexible connections at all conduit and conductor terminations and supports to eliminate sound and vibration transmission to the building structure.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections with the assistance of a factory-authorized service representative.
- B. Small (Up to 167-kVA Single-Phase or 500-kVA Three-Phase) Dry-Type Transformer Field Tests:
 - 1. Visual and Mechanical Inspection.
 - a. Inspect physical and mechanical condition.
 - b. Inspect anchorage, alignment, and grounding.
 - c. Verify that resilient mounts are free and that any shipping brackets have been removed.
 - d. Verify the unit is clean.
 - e. Perform specific inspections and mechanical tests recommended by manufacturer.
 - f. Verify that as-left tap connections are as specified.
 - g. Verify the presence of surge arresters and that their ratings are as specified.
 - 2. Electrical Tests:

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- a. Measure resistance at each winding, tap, and bolted connection.
 - b. Perform insulation-resistance tests winding-to-winding and each winding-to-ground. Apply voltage according to manufacturer's published data. In the absence of manufacturer's published data, comply with NETA ATS, Table 100.5. Calculate polarization index: the value of the index shall not be less than 1.0.
 - c. Perform turns-ratio tests at all tap positions. Test results shall not deviate by more than one-half percent from either the adjacent coils or the calculated ratio. If test fails, replace the transformer.
 - d. Verify correct secondary voltage, phase-to-phase and phase-to-neutral, after energization and prior to loading.
- C. Test Labeling: On completion of satisfactory testing of each unit, attach a dated and signed "Satisfactory Test" label to tested component.

3.5 ADJUSTING

- A. Record transformer secondary voltage at each unit for at least 48 hours of typical occupancy period. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus 5 percent and not being lower than nameplate voltage minus 3 percent at maximum load conditions. Submit recording and tap settings as test results.
- B. Output Settings Report: Prepare a written report recording output voltages and tap settings.

3.6 CLEANING

- A. Vacuum dirt and debris; do not use compressed air to assist in cleaning.

END OF SECTION

SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Distribution panelboards.
 - 2. Lighting and appliance branch-circuit panelboards.

1.2 DEFINITIONS

- A. ATS: Acceptance testing specification.
- B. GFCI: Ground-fault circuit interrupter.
- C. GFEP: Ground-fault equipment protection.
- D. HID: High-intensity discharge.
- E. MCCB: Molded-case circuit breaker.
- F. VPR: Voltage protection rating.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of panelboard.
 - 1. Include materials, switching and overcurrent protective devices, accessories, and components indicated.
 - 2. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.
- B. Shop Drawings: For each panelboard and related equipment.
 - 1. Include dimensioned plans, elevations, sections, and details.
 - 2. Show tabulations of installed devices with nameplates, conductor termination sizes, equipment features, and ratings.
 - 3. Detail enclosure types including mounting and anchorage, environmental protection, knockouts, corner treatments, covers and doors, gaskets, hinges, and locks.
 - 4. Detail bus configuration, current, and voltage ratings.
 - 5. Short-circuit current rating of panelboards and overcurrent protective devices.
 - 6. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
 - 7. Include wiring diagrams for power, signal, and control wiring.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

1.4 INFORMATIONAL SUBMITTALS

- A. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - 1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
 - 2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Keys: Two spares for each type of panelboard cabinet lock.
 - 2. Circuit Breakers Including GFCI and GFEP Types: Two spares for each panelboard.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: ISO 9001 or 9002 certified.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Remove loose packing and flammable materials from inside panelboards; install temporary electric heating (250 W per panelboard) to prevent condensation.
- B. Handle and prepare panelboards for installation according to NEMA PB 1.

1.9 FIELD CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install panelboards until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above panelboards is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 - 2. Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Not exceeding 23 deg F to plus 104 deg F.
 - b. Altitude: Not exceeding 6600 feet.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:
 - 1. Notify Owner no fewer than seven days in advance of proposed interruption of electric service.
 - 2. Do not proceed with interruption of electric service without Owner's written permission.
 - 3. Comply with NFPA 70E.

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace panelboards that fail in materials or workmanship within specified warranty period.
 - 1. Panelboard Warranty Period: 18 months from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANELBOARDS COMMON REQUIREMENTS

- A. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NEMA PB 1.
- D. Comply with NFPA 70.
- E. Enclosures: Flush and Surface-mounted, dead-front cabinets.
 - 1. Rated for environmental conditions at installed location.
 - a. Indoor Dry and Clean Locations: NEMA 250, Type 1.
 - b. Outdoor Locations: NEMA 250, Type 4.
 - c. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
 - 2. Height: 84 inches maximum.
 - 3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover. Trims shall cover all live parts and shall have no exposed hardware.
 - 4. Finishes:
 - a. Panels and Trim: Steel, factory finished immediately after cleaning and pretreating with manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat.
 - b. Back Boxes: Galvanized steel.
- F. Incoming Mains:
 - 1. Location: Convertible between top and bottom.
 - 2. Main Breaker: Main lug interiors up to 400 amperes shall be field convertible to main breaker.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- G. Phase, Neutral, and Ground Buses:
 - 1. Material: Hard-drawn copper, 98 percent conductivity.
 - a. Plating shall run entire length of bus.
 - b. Bus shall be fully rated the entire length.
 - 2. Interiors shall be factory assembled into a unit. Replacing switching and protective devices shall not disturb adjacent units or require removing the main bus connectors.
 - 3. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.
 - 4. Full-Sized Neutral: Equipped with full-capacity bonding strap for service entrance applications. Mount electrically isolated from enclosure. Do not mount neutral bus in gutter.

- H. Conductor Connectors: Suitable for use with conductor material and sizes.
 - 1. Material: Hard-drawn copper, 98 percent conductivity.
 - 2. Terminations shall allow use of 75 deg C rated conductors without derating.
 - 3. Size: Lugs suitable for indicated conductor sizes, with additional gutter space, if required, for larger conductors.
 - 4. Main and Neutral Lugs: Mechanical type, with a lug on the neutral bar for each pole in the panelboard.
 - 5. Ground Lugs and Bus-Configured Terminators: Mechanical type, with a lug on the bar for each pole in the panelboard.
 - 6. Feed-Through Lugs: Mechanical type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
 - 7. Subfeed (Double) Lugs: Mechanical type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.

- I. Future Devices: Panelboards shall have mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
 - 1. Percentage of Future Space Capacity: 20 percent.

- J. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals. Assembly listed by an NRTL for 100 percent interrupting capacity.
 - 1. Panelboards and overcurrent protective devices rated 240 V or less shall have short-circuit ratings as shown on Drawings, but not less than 10,000 A rms symmetrical.
 - 2. Panelboards and overcurrent protective devices rated above 240 V and less than 600 V shall have short-circuit ratings as shown on Drawings, but not less than 14,000 A rms symmetrical.

2.2 POWER PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Sector; Eaton Corporation.
 - 2. General Electric Company; GE Energy Management - Electrical Distribution.
 - 3. Siemens Energy.
 - 4. Square D; by Schneider Electric.

- B. Panelboards: NEMA PB 1, distribution type.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
 - 1. For doors more than 36 inches high, provide two latches, keyed alike.
- D. Mains: Circuit breaker or Lugs only.
- E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
- F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Sector; Eaton Corporation.
 - 2. General Electric Company; GE Energy Management - Electrical Distribution.
 - 3. Siemens Energy.
 - 4. Square D; by Schneider Electric.
- B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.
- C. Mains: Circuit breaker or lugs only.
- D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- E. Doors: Door-in-door construction with concealed hinges; secured with multipoint latch with tumbler lock; keyed alike. Outer door shall permit full access to the panel interior. Inner door shall permit access to breaker operating handles and labeling, but current carrying terminals and bus shall remain concealed.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Sector; Eaton Corporation.
 - 2. General Electric Company; GE Energy Management - Electrical Distribution.
 - 3. Siemens Energy.
 - 4. Square D; by Schneider Electric.
- B. MCCB: Comply with UL 489, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers:
 - a. Inverse time-current element for low-level overloads.
 - b. Instantaneous magnetic trip element for short circuits.
 - c. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.
 - 2. GFCI Circuit Breakers: Single- and double-pole configurations with Class A ground-fault protection (6-mA trip).
 - 3. GFEP Circuit Breakers: Class B ground-fault protection (30-mA trip).

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

4. Subfeed Circuit Breakers: Vertically mounted.
5. MCCB Features and Accessories:
 - a. Standard frame sizes, trip ratings, and number of poles.
 - b. Breaker handle indicates tripped status.
 - c. UL listed for reverse connection without restrictive line or load ratings.
 - d. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
 - e. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and HID lighting circuits.
 - f. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
 - g. Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage.
 - h. Rating Plugs: Three-pole breakers with ampere ratings greater than 150 amperes shall have interchangeable rating plugs or electronic adjustable trip units.
 - i. Multipole units enclosed in a single housing with a single handle.
 - j. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in on or off position.

2.5 IDENTIFICATION

- A. Panelboard Label: Manufacturer's name and trademark, voltage, amperage, number of phases, and number of poles shall be located on the interior of the panelboard door.
- B. Breaker Labels: Faceplate shall list current rating, UL and IEC certification standards, and AIC rating.
- C. Circuit Directory: Directory card inside panelboard door, mounted in metal frame with transparent protective cover.
 1. Circuit directory shall identify specific purpose with detail sufficient to distinguish it from all other circuits.

2.6 ACCESSORY COMPONENTS AND FEATURES

- A. Accessory Set: Include tools and miscellaneous items required for overcurrent protective device test, inspection, maintenance, and operation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify actual conditions with field measurements prior to ordering panelboards to verify that equipment fits in allocated space in, and comply with, minimum required clearances specified in NFPA 70.
- B. Receive, inspect, handle, and store panelboards according to NEMA PB 1.1.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- C. Examine panelboards before installation. Reject panelboards that are damaged, rusted, or have been subjected to water saturation.
- D. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
- B. Comply with NECA 1.
- C. Install panelboards and accessories according to NEMA PB 1.1.
- D. Equipment Mounting:
 - 1. Attach panelboard to the vertical finished or structural surface behind the panelboard.
- E. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.
- F. Mount top of trim 90 inches above finished floor unless otherwise indicated.
- G. Mount panelboard cabinet plumb and rigid without distortion of box.
- H. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- I. Mounting panelboards with space behind is recommended for damp, wet, or dirty locations. The steel slotted supports in the following paragraph provide an even mounting surface and the recommended space behind to prevent moisture or dirt collection.
- J. Mount surface-mounted panelboards to steel slotted supports 1 1/4 inch in depth. Orient steel slotted supports vertically.
- K. Install overcurrent protective devices and controllers not already factory installed.
 - 1. Set field-adjustable, circuit-breaker trip ranges.
 - 2. Tighten bolted connections and circuit breaker connections using calibrated torque wrench or torque screwdriver per manufacturer's written instructions.
- L. Make grounding connections and bond neutral for services and separately derived systems to ground. Make connections to grounding electrodes, separate grounds for isolated ground bars, and connections to separate ground bars.
- M. Install filler plates in unused spaces.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- N. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.
- O. Arrange conductors in gutters into groups and bundle and wrap with wire ties after completing load balancing.

3.3 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems."
- B. Create a directory to indicate installed circuit loads after balancing panelboard loads; incorporate Owner's final room designations. Obtain approval before installing. Handwritten directories are not acceptable. Install directory inside panelboard door.
- C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- D. Device Nameplates: Label each branch circuit device in power panelboards with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- E. Install warning signs complying with requirements in Section 260553 "Identification for Electrical Systems" identifying source of remote circuit.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.
- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test for low-voltage air circuit breakers stated in NETA ATS, Paragraph 7.6 Circuit Breakers. Perform optional tests. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 3. Perform the following infrared scan tests and inspections and prepare reports:
 - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each panelboard. Remove front panels so joints and connections are accessible to portable scanner.
 - b. Instruments and Equipment:
 - 1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- D. Panelboards will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results, with comparisons of the two scans. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.
- B. Set field-adjustable circuit-breaker trip ranges.
- C. Load Balancing: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes. Prior to making circuit changes to achieve load balancing, inform Architect of effect on phase color coding.
 - 1. Measure loads during period of normal facility operations.
 - 2. Perform circuit changes to achieve load balancing outside normal facility operation schedule or at times directed by the Architect. Avoid disrupting services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
 - 3. After changing circuits to achieve load balancing, recheck loads during normal facility operations. Record load readings before and after changing circuits to achieve load balancing.
 - 4. Tolerance: Maximum difference between phase loads, within a panelboard, shall not exceed 20 percent.

3.6 PROTECTION

- A. Temporary Heating: Prior to energizing panelboards, apply temporary heat to maintain temperature according to manufacturer's written instructions.

END OF SECTION

SECTION 26 27 26
WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
 - 2. USB charger devices.
 - 3. Twist-locking receptacles.
 - 4. Weather-resistant receptacles.
 - 5. Snap switches.
 - 6. Pendant cord-connector devices.
 - 7. Cord and plug sets.
 - 8. Floor service outlets and poke-through assemblies.

1.2 DEFINITIONS

- A. GFCI: Ground-fault circuit interrupter.
- B. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- C. UTP: Unshielded twisted pair.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Receptacles for Owner-Furnished Equipment: Match plug configurations.
 - 2. Cord and Plug Sets: Match equipment requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: List of legends and description of materials and process used for pre-marking wall plates.

1.5 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Service-Outlet Assemblies: One for every 10, but no fewer than one.
 - 2. Poke-Through, Fire-Rated Closure Plugs: One for every five floor service outlets installed, but no fewer than two.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - 2. Hubbell Incorporated; Wiring Device-Kellems.
 - 3. Leviton Manufacturing Co., Inc.
 - 4. Pass & Seymour/Legrand (Pass & Seymour).
- B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

2.3 USB CHARGER DEVICES

- A. Tamper-Resistant, USB Charger Receptacles: 12 V dc, 2.0 A, USB Type A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, UL 1310, and FS W-C-596.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Eaton (Arrow Hart).
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

2. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap.
3. USB Receptacles: Dual, Type A.
4. Line Voltage Receptacles: Dual, two pole, three wire, and self-grounding.

2.4 TWIST-LOCKING RECEPTACLES

- A. Single Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration as indicated on drawings, and UL 498.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).

2.5 PENDANT CORD-CONNECTOR DEVICES

- A. Description:
1. Matching, locking-type plug and receptacle body connector.
 2. NEMA WD 6 Configurations L5-20P and L5-20R, heavy-duty grade, and FS W-C-596.
 3. Body: Nylon, with screw-open, cable-gripping jaws and provision for attaching external cable grip.
 4. External Cable Grip: Woven wire-mesh type made of high-strength, galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.

2.6 CORD AND PLUG SETS

- A. Description:
1. Match voltage and current ratings and number of conductors to requirements of equipment being connected.
 2. Cord: Rubber-insulated, stranded-copper conductors, with Type SOW-A jacket; with green-insulated grounding conductor and ampacity of at least 130 percent of the equipment rating.
 3. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.7 DECORATOR-STYLE DEVICES

- A. Convenience Receptacles: Square face, 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, and UL 498.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).
- B. GFCI, Feed-Through Type, Convenience Receptacles: Square face, 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and UL 943 Class A.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).
- C. GFCI, Weather-Resistant Convenience Receptacles: Square face, 125 V, 20 A; comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and UL 943 Class A.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Pass & Seymour/Legrand (Pass & Seymour).
- D. Toggle Switches, Square Face, 120/277 V, 20 A: Comply with NEMA WD 1, UL 20, and FS W-S-896.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).
- E. Lighted Toggle Switches, Square Face, 120 V, 20 A: Comply with NEMA WD 1 and UL 20.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Cooper Wiring Devices, Inc.; Division of Cooper Industries, Inc.
 - b. Hubbell Incorporated; Wiring Device-Kellems.
 - c. Leviton Manufacturing Co., Inc.
 - d. Pass & Seymour/Legrand (Pass & Seymour).
 2. Description: With neon-lighted handle, illuminated when switch is "off."
- F. All branch circuits rated at 15 amperes shall only have receptacles rated at 15 amperes connected to it.

2.8 WALL PLATES

- A. Single and combination types shall match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: Steel with white baked enamel, suitable for field painting.
 - 3. Material for Unfinished Spaces: Galvanized steel.
 - 4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
- B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

2.9 FLOOR SERVICE FITTINGS

- A. Type: Modular, flush-type, dual-service units suitable for wiring method used.
- B. Compartments: Barrier separates power from voice and data communication cabling.
- C. Service Plate: Rectangular, solid brass with satin finish.
- D. Power Receptacle: NEMA WD 6 Configuration 5-20R, gray finish, unless otherwise indicated.

2.10 POKE-THROUGH ASSEMBLIES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - 1. Hubbell Incorporated; Wiring Device-Kellems.
 - 2. Pass & Seymour/Legrand (Pass & Seymour).
 - 3. Square D; by Schneider Electric.
 - 4. Thomas & Betts Corporation, A Member of the ABB Group.
 - 5. Wiremold / Legrand.
- B. Description:
 - 1. Factory-fabricated and -wired assembly of below-floor junction box with multichanneled, through-floor raceway/firestop unit and detachable matching floor service-outlet assembly.
 - 2. Comply with UL 514 scrub water exclusion requirements.
 - 3. Service-Outlet Assembly: Pedestal type with services indicated.
 - 4. Size: Selected to fit nominal 3-inch cored holes in floor and matched to floor thickness.
 - 5. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.
 - 6. Closure Plug: Arranged to close unused 3-inch cored openings and reestablish fire rating of floor.
 - 7. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors and a minimum of four, four-pair cables.

2.11 FINISHES

- A. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
- B. Wall Plate Color: For plastic covers, match device color.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
 - 1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
 - 2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
 - 3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
 - 4. Install wiring devices after all wall preparation, including painting, is complete.
- C. Conductors:
 - 1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
 - 2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
 - 3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
 - 4. Existing Conductors:
 - a. Cut back and pigtail, or replace all damaged conductors.
 - b. Straighten conductors that remain and remove corrosion and foreign matter.
 - c. Pigtailling existing conductors is permitted, provided the outlet box is large enough.
- D. Device Installation:
 - 1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
 - 2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
 - 3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
 - 4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
 6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
 7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
 8. Tighten unused terminal screws on the device.
 9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.
- E. Receptacle Orientation:
1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.
- F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.
- G. Dimmers:
1. Install dimmers within terms of their listing.
 2. Verify that dimmers used for fan speed control are listed for that application.
 3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.
- H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
- I. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.
- 3.2 GFCI RECEPTACLES
- A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.
- 3.3 IDENTIFICATION
- A. Comply with Section 260553 "Identification for Electrical Systems."
- 3.4 FIELD QUALITY CONTROL
- A. Perform the following tests and inspections:
 1. Test Instruments: Use instruments that comply with UL 1436.
 2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
 - B. Tests for Convenience Receptacles:

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

1. Line Voltage: Acceptable range is 105 to 132 V.
 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
- C. Wiring device will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION

SECTION 26 28 13

FUSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cartridge fuses rated 600 V ac and less for use in the following:
 - a. Control circuits.
 - b. Switchboards.
 - c. Enclosed controllers.
 - d. Enclosed switches.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles. Include the following for each fuse type indicated:
1. Dimensions and manufacturer's technical data on features, performance, electrical characteristics, and ratings.
 2. Coordination charts and tables and related data.
 3. Fuse sizes for elevator feeders and elevator disconnect switches.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fuses to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017700 "Closeout Procedures," include the following:
1. Ambient temperature adjustment information.
 2. Current-limitation curves for fuses with current-limiting characteristics.
 3. Coordination charts and tables and related data.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.

1.5 FIELD CONDITIONS

- A. Where ambient temperature to which fuses are directly exposed is less than 40 deg F or more than 100 deg F, apply manufacturer's ambient temperature adjustment factors to fuse ratings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cooper Bussmann; a division of Cooper Industries.
 - 2. Edison; a brand of Cooper Bussmann; a division of Cooper Industries.
 - 3. Littelfuse, Inc.
 - 4. Mersen USA.
- B. Source Limitations: Obtain fuses, for use within a specific product or circuit, from single source from single manufacturer.

2.2 CARTRIDGE FUSES

- A. Characteristics: NEMA FU 1, current-limiting, nonrenewable cartridge fuses with voltage ratings consistent with circuit voltages.
 - 1. Type RK-1: 600-V, zero- to 600-A rating, 200 kAIC, time delay.
 - 2. Type CC: 600-V, zero- to 30-A rating, 200 kAIC, fast acting.
 - 3. Type J: 600-V, zero- to 600-A rating, 200 kAIC.
 - 4. Type L: 600-V, 601- to 6000-A rating, 200 kAIC, time delay.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Comply with NEMA FU 1 for cartridge fuses.
- D. Comply with NFPA 70.
- E. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size and with system short-circuit current levels.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fuses before installation. Reject fuses that are moisture damaged or physically damaged.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- B. Examine holders to receive fuses for compliance with installation tolerances and other conditions affecting performance, such as rejection features.
- C. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.
- D. Evaluate ambient temperatures to determine if fuse rating adjustment factors must be applied to fuse ratings.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

- A. Cartridge Fuses:
 - 1. Service Entrance: Class L, time delay.
 - 2. Feeders: Class RK1, time delay.
 - 3. Motor Branch Circuits: Class RK1, time delay.
 - 4. Power Electronics Circuits: Class J, high speed.
 - 5. Other Branch Circuits: Class J, fast acting.
 - 6. Control Transformer Circuits: Class CC, time delay, control transformer duty.
 - 7. Provide open-fuse indicator fuses or fuse covers with open fuse indication.

3.3 INSTALLATION

- A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.4 IDENTIFICATION

- A. Install labels complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems" and indicating fuse replacement information inside of door of each fused switch and adjacent to each fuse block, socket, and holder.

END OF SECTION

SECTION 26 28 16

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fusible switches.
 - 2. Nonfusible switches.
 - 3. Enclosures.

1.2 DEFINITIONS

- A. NC: Normally closed.
- B. NO: Normally open.
- C. SPDT: Single pole, double throw.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.
 - 1. Enclosure types and details for types other than NEMA 250, Type 1.
 - 2. Current and voltage ratings.
 - 3. Short-circuit current ratings (interrupting and withstand, as appropriate).
 - 4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.
- B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Wiring Diagrams: For power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - 1. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.
 - 2. Fuse Pullers: Two for each size and type.

1.7 QUALITY ASSURANCE

- A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.
- B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- D. Comply with NFPA 70.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - 1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.
 - 2. Altitude: Not exceeding 6600 feet.

1.9 COORDINATION

- A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Sector; Eaton Corporation.
 - 2. General Electric Company.
 - 3. Siemens Industry, Inc.
 - 4. Square D; by Schneider Electric.

- B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

- C. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 - 3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
 - 4. Auxiliary Contact Kit: Two NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open.
 - 5. Lugs: Mechanical type, suitable for number, size, and conductor material.
 - 6. Service-Rated Switches: Labeled for use as service equipment.
 - 7. Accessory Control Power Voltage: Remote mounted and powered; 120-V ac.

2.2 NONFUSIBLE SWITCHES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Electrical Sector; Eaton Corporation.
 - 2. General Electric Company.
 - 3. Siemens Industry, Inc.
 - 4. Square D; by Schneider Electric.

- B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

- C. Accessories:
 - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
 - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
 - 3. Auxiliary Contact Kit: Two NO/NC (Form "C") auxiliary contact(s), arranged to activate before switch blades open.
 - 4. Lugs: Mechanical type, suitable for number, size, and conductor material.
 - 5. Accessory Control Power Voltage: Remote mounted and powered; 120-V ac.

2.3 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
 - 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 - 2. Outdoor Locations: NEMA 250, Type 4.
 - 3. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.
- C. Install fuses in fusible devices.
- D. Comply with NECA 1.

3.3 IDENTIFICATION

- A. Comply with requirements in Section 260553 "Identification for Electrical Systems."
 - 1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
 - 2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Acceptance Testing Preparation:
 - 1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
 - 2. Test continuity of each circuit.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- C. Tests and Inspections:
 - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
 - 3. Perform the following infrared scan tests and inspections and prepare reports:
 - a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each enclosed switch and circuit breaker. Remove front panels so joints and connections are accessible to portable scanner.
 - b. Instruments and Equipment: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - 4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports, including a certified report that identifies enclosed switches and circuit breakers and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

- A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION

SECTION 26 51 19
LED INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior solid-state luminaires that use LED technology.
 - 2. Lighting fixture supports.
- B. Related Requirements:
 - 1. Section 260923 "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.

1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. LED: Light-emitting diode.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Arrange in order of luminaire designation.
 - 2. Include data on features, accessories, and finishes.
 - 3. Include physical description and dimensions of luminaires.
 - 4. Include emergency lighting units, including batteries and chargers.
 - 5. Include life, output (lumens, CCT, and CRI), and energy efficiency data.
 - 6. Photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing and Calculation Guides, of each lighting fixture type. The adjustment factors shall be for lamps and accessories identical to those indicated for the lighting fixture as applied in this Project.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- a. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

- B. Product Schedule: For luminaires and lamps. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- B. Product Certificates: For each type of luminaire.
- C. Product Test Reports: For each luminaire, for tests performed by manufacturer and witnessed by a qualified testing agency.
- D. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For luminaires and lighting systems to include in operation and maintenance manuals.
 - 1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Lamps: Ten for every 100 of each type and rating installed. Furnish at least one of each type.
 - 2. Diffusers and Lenses: One for every 100 of each type and rating installed. Furnish at least one of each type.
 - 3. Globes and Guards: One for every 20 of each type and rating installed. Furnish at least one of each type.

1.7 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturer's laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.
- B. Provide luminaires from a single manufacturer for each luminaire type.
- C. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.9 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: Five year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
- C. Recessed Fixtures: Comply with NEMA LE 4.
- D. Bulb shape complying with ANSI C79.1.
- E. Lamp base complying with ANSI C81.61 or IEC 60061-1.
- F. Rated lamp life of 35,000 hours.
- G. Lamps dimmable from 100 percent to 0 percent of maximum light output.
- H. Internal driver.
- I. Nominal Operating Voltage: As indicated on Plans.
 - 1. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
- J. Housings:
 - 1. Extruded-aluminum housing and heat sink.
 - 2. powder-coat finish.

2.2 DOWNLIGHT

- A. See Plans for manufacturers.
- B. Minimum 1,000 lumens. Minimum allowable efficacy of 80 lumens per watt.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- C. Universal mounting bracket.
- D. Integral junction box with conduit fittings.

2.3 LINEAR INDUSTRIAL

- A. See Plans for manufacturers.
- B. Minimum 5,000 lumens. Minimum allowable efficacy of 80 lumens per watt.
- C. Housing and heat sink rated to the following:
 1. NEMA 4X.
 2. IP 54.
 3. IP 66.
 4. Marine and wet locations.
 5. CSA C22.2 No 137.

2.4 RECESSED LINEAR

- A. See Plans for manufacturers.
- B. Minimum 2,000 lumens. Minimum allowable efficacy of 85 lumens per watt.
- C. Integral junction box with conduit fittings.

2.5 STRIP LIGHT

- A. See Plans for manufacturers.
- B. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- C. Integral junction box with conduit fittings.

2.6 SURFACE MOUNT, LINEAR

- A. See Plans for manufacturers.
- B. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- C. Integral junction box with conduit fittings.

2.7 SURFACE MOUNT, NONLINEAR

- A. See Plans for manufacturers.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- B. Minimum 750 lumens. Minimum allowable efficacy of 80 lumens per watt.
- C. Integral junction box with conduit fittings.

2.8 SUSPENDED, LINEAR

- A. See Plans for manufacturers.
- B. Minimum 2,000 lumens. Minimum allowable efficacy of 85 lumens per watt.

2.9 SUSPENDED, NONLINEAR

- A. See Plans for manufacturers.
- B. Minimum 2,000 lumens. Minimum allowable efficacy of 85 lumens per watt.
- C. Integral junction box with conduit fittings.

2.10 MATERIALS

- A. Metal Parts:
 - 1. Free of burrs and sharp corners and edges.
 - 2. Sheet metal components shall be steel unless otherwise indicated.
 - 3. Form and support to prevent warping and sagging.
- B. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- C. Diffusers and Globes:
 - 1. prismatic acrylic
 - 2. Acrylic Diffusers: One hundred percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - 3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
- D. Housings:
 - 1. Extruded-aluminum housing and heat sink.
 - 2. powder-coat finish.
- E. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
 - 1. Label shall include the following lamp characteristics:
 - a. "USE ONLY" and include specific lamp type.
 - b. Lamp diameter, shape, size, wattage, and coating.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- c. CCT and CRI for all luminaires.

2.11 METAL FINISHES

- A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.12 LUMINAIRE FIXTURE SUPPORT COMPONENTS

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.
- C. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 12 gage.
- D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before fixture installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

- A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is sufficiently complete, clean luminaires used for temporary lighting and install new lamps.

3.3 INSTALLATION

- A. Comply with NECA 1.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- C. Install lamps in each luminaire.
- D. Supports:
 - 1. Sized and rated for luminaire weight.
 - 2. Able to maintain luminaire position after cleaning and relamping.
 - 3. Provide support for luminaire without causing deflection of ceiling or wall.
 - 4. Luminaire mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and vertical force of 400 percent of luminaire weight.
- E. Flush-Mounted Luminaire Support:
 - 1. Secured to outlet box.
 - 2. Attached to ceiling structural members at four points equally spaced around circumference of luminaire.
 - 3. Trim ring flush with finished surface.
- F. Wall-Mounted Luminaire Support:
 - 1. Attached to structural members in walls.
 - 2. Do not attach luminaires directly to gypsum board.
- G. Ceiling-Mounted Luminaire Support:
 - 1. Ceiling mount with two 5/32-inch-diameter aircraft cable supports adjustable to 120 inches in length.
 - 2. Ceiling mount with pendant mount with 5/32-inch-diameter aircraft cable supports adjustable to 120 inches in length.
 - 3. Ceiling mount with hook mount.
- H. Suspended Luminaire Support:
 - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
 - 2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
 - 3. Continuous Rows of Luminaires: Use tubing or stem for wiring at one point and wire support for suspension for each unit length of luminaire chassis, including one at each end.
 - 4. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.
- I. Ceiling-Grid-Mounted Luminaires:
 - 1. Secure to any required outlet box.
 - 2. Secure luminaire to the luminaire opening using approved fasteners in a minimum of four locations, spaced near corners of luminaire.
 - 3. Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of four locations, spaced near corners of luminaire.
- J. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

3.4 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
 - 2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.
- B. Luminaire will be considered defective if it does not pass operation tests and inspections.
- C. Prepare test and inspection reports.

3.6 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.
 - 1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
 - 2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 - 3. Adjust the aim of luminaires in the presence of the Architect.

END OF SECTION

SECTION 26 52 19

EMERGENCY AND EXIT LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Emergency lighting units.
 - 2. Exit signs.
 - 3. Luminaire supports.

1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Emergency Lighting Unit: A lighting unit with internal or external emergency battery powered supply and the means for controlling and charging the battery and unit operation.
- D. Fixture: See "Luminaire" Paragraph.
- E. Lumen: Measured output of lamp and luminaire, or both.
- F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of emergency lighting unit, exit sign, and emergency lighting support.
 - 1. Include data on features, accessories, and finishes.
 - 2. Include physical description of the unit and dimensions.
 - 3. Battery and charger for light units.
 - 4. Include life, output of luminaire (lumens, CCT, and CRI), and energy-efficiency data.
 - 5. Include photometric data and adjustment factors based on laboratory tests, complying with IES LM-45, for each luminaire type.
 - a. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. Shop Drawings: For nonstandard or custom luminaires.
 - 1. Include plans, elevations, sections, and mounting and attachment details.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

C. Product Schedule:

1. For emergency lighting units. Use same designations indicated on Drawings.
2. For exit signs. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of luminaire.
- B. Product Test Reports: For each luminaire for tests performed by manufacturer and witnessed by a qualified testing agency.
- C. Sample Warranty: For manufacturer's warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For luminaires and lighting systems to include in emergency, operation, and maintenance manuals.
 1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Lamps: 10 for every 100 of each type and rating installed. Furnish at least one of each type.
 2. Luminaire-mounted, emergency battery pack: One for every 20 emergency lighting units. Furnish at least one of each type.
 3. Diffusers and Lenses: One for every 100 of each type and rating installed. Furnish at least one of each type.
 4. Globes and Guards: One for every 20 of each type and rating installed. Furnish at least one of each type.

1.7 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturer's laboratory that is accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.9 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two year(s) from date of Substantial Completion.
- B. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period for Emergency Power Unit Batteries: 5 years from date of Substantial Completion. Full warranty shall apply for the entire warranty period.
 - 2. Warranty Period for Emergency Fluorescent Ballast and Self-Powered Exit Sign Batteries: Seven years from date of Substantial Completion. Full warranty shall apply for the entire warranty period.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR EMERGENCY LIGHTING

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NRTL Compliance: Fabricate and label emergency lighting units, exit signs, and batteries to comply with UL 924.
- C. Comply with NFPA 70 and NFPA 101.
- D. Comply with NEMA LE 4 for recessed luminaires.
- E. Comply with UL 1598 for fluorescent luminaires.
- F. Lamp Base: Comply with ANSI C81.61 or IEC 60061-1.
- G. Bulb Shape: Complying with ANSI C79.1.
- H. Internal Type Emergency Power Unit: Self-contained, modular, battery-inverter unit, factory mounted within luminaire body and compatible with ballast.
 - 1. Emergency Connection: Operate one lamp(s) continuously at an output of 1100 lumens each upon loss of normal power. Connect unswitched circuit to battery-inverter unit and switched circuit to luminaire ballast.

2. Operation: Relay automatically turns lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
3. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:
 - a. Ambient Temperature: Less than 0 deg F or exceeding 104 deg F, with an average value exceeding 95 deg F over a 24-hour period.
 - b. Ambient Storage Temperature: Not less than minus 4 deg F and not exceeding 140 deg F.
 - c. Humidity: More than 95 percent (condensing).
 - d. Altitude: Exceeding 3300 feet.
4. Nightlight Connection: Operate lamp continuously at 40 percent of rated light output.
5. Test Push-Button and Indicator Light: Visible and accessible without opening luminaire or entering ceiling space.
 - a. Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - b. Indicator Light: LED indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
6. Battery: Sealed, maintenance-free, nickel-cadmium type.
7. Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.
8. Remote Test: Switch in handheld remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.

2.2 EMERGENCY LIGHTING

- A. General Requirements for Emergency Lighting Units: Self-contained units.
- B. Emergency Luminaires:
 1. See Plans for manufacturers.
 2. Emergency Luminaires: as indicated on Interior Lighting Fixture Schedule, with the following additional features:
 - a. Operating at nominal voltage of 120 V ac or 277 V ac.
 - b. Internal emergency power unit unless powered via UPS system, See Plans for circuiting information and details.
 - c. Rated for installation in damp locations, and for sealed and gasketed luminaires in wet locations.
- C. Emergency Lighting Unit:
 1. See Plans for manufacturers.
 2. Emergency Lighting Unit: as indicated on Interior Lighting Fixture Schedule.
 3. Operating at nominal voltage of 120 V ac or 277 V ac.
 4. Wall with universal junction box adaptor.
 5. UV stable thermoplastic housing, rated for damp locations.
 6. Two LED lamp heads.

7. Internal emergency power unit.

D. Remote Emergency Lighting Units:

1. See Plans for manufacturers.
2. Emergency Lighting Unit: as indicated on Interior Lighting Fixture Schedule.
3. Operating at nominal voltage of 120 V ac or 277 V ac.
4. Wall with universal junction box adaptor.
5. UV stable thermoplastic housing, rated for damp locations.
6. LED lamp heads.
7. External emergency power unit.

2.3 EXIT SIGNS

A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.

B. Internally Lighted Signs:

1. See Plans for manufacturers.
2. Operating at nominal voltage of 120 V ac or 277 V ac.
3. Lamps for AC Operation: Fluorescent, two for each luminaire; 20,000 hours of rated lamp life.
4. Lamps for AC Operation: LEDs; 50,000 hours minimum rated lamp life.
5. Self-Powered Exit Signs (Battery Type): Internal emergency power unit.
6. Master/Remote Sign Configurations:
 - a. Master Unit: Comply with requirements above for self-powered exit signs, and provide additional capacity in LED power supply and battery for power connection to remote unit.
 - b. Remote Unit: Comply with requirements above for self-powered exit signs, except omit power supply, battery, and test features. Arrange to receive full power requirements from master unit. Connect for testing concurrently with master unit as a unified system.

2.4 MATERIALS

A. Metal Parts:

1. Free of burrs and sharp corners and edges.
2. Sheet metal components shall be steel unless otherwise indicated.
3. Form and support to prevent warping and sagging.

B. Doors, Frames, and Other Internal Access:

1. Smooth operating, free of light leakage under operating conditions.
2. Designed to permit relamping without use of tools.
3. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

C. Diffusers and Globes:

1. Prismatic acrylic.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

2. Acrylic: 100 percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

D. Housings:

1. Extruded aluminum housing and heat sink.
2. powder coat finish.

- E. Conduit: Electrical metallic tubing or Flexible metallic conduit, minimum 3/4 inch in diameter.

2.5 METAL FINISHES

- A. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 LUMINAIRE SUPPORT COMPONENTS

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Support Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for conditions affecting performance of luminaires.
- B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation.
- C. Examine walls, floors, roofs, and ceilings for suitable conditions where emergency lighting luminaires will be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with NECA 1.
- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- C. Install lamps in each luminaire.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- D. Supports:
 - 1. Sized and rated for luminaire and emergency power unit weight.
 - 2. Able to maintain luminaire position when testing emergency power unit.
 - 3. Provide support for luminaire and emergency power unit without causing deflection of ceiling or wall.
 - 4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire and emergency power unit weight and vertical force of 400 percent of luminaire weight.

- E. Wall-Mounted Luminaire Support:
 - 1. Attached to structural members in walls.
 - 2. Do not attach luminaires directly to gypsum board.

- F. Suspended Luminaire Support:
 - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
 - 2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
 - 3. Continuous Rows of Luminaires: Use tubing or stem for wiring at one point and wire support for suspension for each unit length of luminaire chassis, including one at each end.
 - 4. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.

- G. Ceiling Grid Mounted Luminaires:
 - 1. Secure to any required outlet box.
 - 2. Secure emergency power unit using approved fasteners in a minimum of four locations, spaced near corners of emergency power unit.
 - 3. Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of four locations, spaced near corners of luminaire.

3.3 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

- B. Luminaire will be considered defective if it does not pass operation tests and inspections.

- C. Prepare test and inspection reports.

3.5 STARTUP SERVICE

- A. Perform startup service:
 - 1. Charge emergency power units and batteries minimum of one hour and depress switch to conduct short-duration test.
 - 2. Charge emergency power units and batteries minimum of 24 hours and conduct one-hour discharge test.

3.6 ADJUSTING

- A. Adjustments: Within 12 months of date of Substantial Completion, provide on-site visit to do the following:
 - 1. Inspect all luminaires. Replace lamps, emergency power units, batteries, signs, or luminaires that are defective.
 - a. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 - 2. Conduct short-duration tests on all emergency lighting.

END OF SECTION

SECTION 26 56 19

EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior solid-state luminaires that are designed for and exclusively use LED lamp technology.
2. Luminaire supports.

B. Related Requirements:

1. Section 260923 "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.

1.2 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color rendering index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. Lumen: Measured output of lamp and luminaire, or both.
- F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of luminaire.

1. Arrange in order of luminaire designation.
2. Include data on features, accessories, and finishes.
3. Include physical description and dimensions of luminaire.
4. Lamps, include life, output (lumens, CCT, and CRI), and energy-efficiency data.
5. Photometric data and adjustment factors based on laboratory tests, complying with IES Lighting Measurements Testing and Calculation Guides, of each luminaire type. The adjustment factors shall be for lamps and accessories identical to those indicated for the luminaire as applied in this Project.
 - a. Manufacturer's Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the NVLAP for Energy Efficient Lighting Products.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

6. Wiring diagrams for power, control, and signal wiring.
7. Means of attaching luminaires to supports and indication that the attachment is suitable for components involved.

B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

C. Product Schedule: For luminaires and lamps. Use same designations indicated on Drawings.

D. Delegated-Design Submittal: For luminaire supports.

1. Include design calculations for luminaire supports.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For each type of the following:

1. Luminaire.

B. Product Test Reports: For each luminaire, for tests performed by manufacturer and witnessed by a qualified testing agency.

C. Source quality-control reports.

D. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires to include in operation and maintenance manuals.

1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps: Ten for every 100 of each type and rating installed. Furnish at least one of each type.
2. Glass, Acrylic, and Plastic Lenses, Covers, and Other Optical Parts: One for every 100 of each type and rating installed. Furnish at least one of each type.
3. Diffusers and Lenses: One for every 100 of each type and rating installed. Furnish at least one of each type.
4. Globes and Guards: One for every 20 of each type and rating installed. Furnish at least one of each type.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

1.7 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturers' laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.
- B. Provide luminaires from a single manufacturer for each luminaire type.
- C. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.
- D. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering prior to shipping.

1.9 FIELD CONDITIONS

- A. Verify existing and proposed utility structures prior to the start of work associated with luminaire installation.
- B. Mark locations of exterior luminaires for approval by Architect prior to the start of luminaire installation.

1.10 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including luminaire support components.
 - b. Faulty operation of luminaires and accessories.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: 2 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

2.2 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

- B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.
- C. UL Compliance: Comply with UL 1598 and listed for wet location.
- D. Lamp base complying with ANSI C81.61 or IEC 60061-1.
- E. Bulb shape complying with ANSI C79.1.
- F. CRI of minimum 70. CCT of 4000 K.
- G. L70 lamp life of 50,000 hours.
- H. Lamps dimmable from 100 percent to 0 percent of maximum light output.
- I. Internal driver.
- J. Nominal Operating Voltage: 277 V ac.
- K. Lamp Rating: Lamp marked for outdoor use and in enclosed locations.
- L. Source Limitations: For luminaires, obtain each color, grade, finish, type, and variety of luminaire from single source with resources to provide products of consistent quality in appearance and physical properties.

2.3 LUMINAIRE TYPES

- A. Area and Site:
 - 1. See Plans for manufacturers.
 - 2. Luminaire Shape: Square.
 - 3. Mounting: Building.
 - 4. Luminaire-Mounting Height: As indicated on architectural plans.
 - 5. Distribution: Type IV.
 - 6. Diffusers and Globes: Prismatic acrylic.
 - 7. Housings:
 - a. Extruded-aluminum housing and heat sink.
 - b. powder-coat finish.

2.4 MATERIALS

- A. Metal Parts: Free of burrs and sharp corners and edges.
- B. Sheet Metal Components: Corrosion-resistant aluminum. Form and support to prevent warping and sagging.
- C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.

D. Diffusers and Globes:

1. Acrylic Diffusers: 100 percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
2. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

E. Lens and Refractor Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

F. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.

G. Housings:

1. Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
2. Provide filter/breather for enclosed luminaires.

H. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp characteristics:
 - a. "USE ONLY" and include specific lamp type.
 - b. Lamp diameter, shape, size, wattage and coating.
 - c. CCT and CRI for all luminaires.

2.5 FINISHES

A. Variations in Finishes: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

C. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20 requirements; and seal aluminum surfaces with clear, hard-coat wax.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

3. Class I, Clear-Anodic Finish: AA-M32C22A41 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
4. Class I, Color-Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker), complying with AAMA 611.
 - a. Color: As indicated on plans.

2.6 LUMINAIRE SUPPORT COMPONENTS

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for luminaire electrical conduit to verify actual locations of conduit connections before luminaire installation.
- C. Examine walls for suitable conditions where luminaires will be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

- A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is substantially complete, clean luminaires used for temporary lighting and install new lamps.

3.3 GENERAL INSTALLATION REQUIREMENTS

- A. Comply with NECA 1.
- B. Install lamps in each luminaire.
- C. Fasten luminaire to structural support.
- D. Supports:
 1. Sized and rated for luminaire weight.
 2. Able to maintain luminaire position after cleaning and relamping.
 3. Support luminaires without causing deflection of finished surface.

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.
 - E. Wall-Mounted Luminaire Support:
 1. Attached to structural members in walls.
 - F. Wiring Method: Install cables in raceways. Conceal raceways and cables.
 - G. Install luminaires level, plumb, and square with finished grade unless otherwise indicated. Install luminaires at height and aiming angle as indicated on Drawings.
 - H. Coordinate layout and installation of luminaires with other construction.
 - I. Adjust luminaires that require field adjustment or aiming.
 - J. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" and 260533 "Raceways and Boxes for Electrical Systems" for wiring connections and wiring methods.
- 3.4 BOLLARD LUMINAIRE INSTALLATION:
- A. Align units for optimum directional alignment of light distribution.
 - B. Install on concrete base with top 4 inches above finished grade or surface at luminaire location. Cast conduit into base, and shape base to match shape of bollard base. Finish by troweling and rubbing smooth. Concrete materials, installation, and finishing are specified in Section 033000 "Cast-in-Place Concrete."
- 3.5 CORROSION PREVENTION
- A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.
 - B. Steel Conduits: Comply with Section 260533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch-thick, pipe-wrapping plastic tape applied with a 50 percent overlap.
- 3.6 IDENTIFICATION
- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- 3.7 FIELD QUALITY CONTROL
- A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.
 - B. Perform the following tests and inspections:

CONTRACT NO. 22-522
DIVISION 26 – ELECTRICAL

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

C. Illumination Tests:

1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IES testing guide(s):
 - a. IES LM-5.
 - b. IES LM-50.
 - c. IES LM-52.
 - d. IES LM-64.
 - e. IES LM-72.
2. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

D. Luminaire will be considered defective if it does not pass tests and inspections.

E. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.8 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain luminaires.

3.9 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to two visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.
 1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
 2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 3. Adjust the aim of luminaires in the presence of the Architect.

END OF SECTION

NO TEXT ON THIS PAGE

SECTION 31 00 00

EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall perform all excavating, backfilling, compaction, testing and disposing of earth materials as shown, specified, and required for the purpose of construction of the Work as specified herein or indicated on the contract documents.
2. Also included is earthwork necessary for removal and replacement of utilities, structures, foundations, sub-surface vaults, pavements, and other facilities as required to complete the Work as shown and specified. All materials necessary for fill, backfill, granular embedment and crushed stone are included.
3. All necessary preparation of subgrade is included.
4. Disposal of Excavated Materials: All excavated materials encountered/generated during construction shall be managed on-site in accordance with the minimum soil erosion and sediment control procedures outlined in the Contract Documents. The Contractor shall coordinate the location of the excavated material stockpile with the Owner. Contractor shall be responsible for implementing all soil erosion measures necessary to isolate the excavated materials from the surrounding environment. Contractor shall also be responsible for the proper characterization (i.e., testing), handling, loading and off-site transportation and disposal of all excess soil encountered/generated throughout the performance of the work. The Contractor shall provide his own data for this purpose. The Contractor may direct load excavated soil into the Contractor's disposal trucks or shipping containers for off-site transportation and disposal, provided that the soil to be excavated has been properly characterized in-situ, as approved by the Owner and the disposal facility.
5. Soil that shall be excavated as part of this project has been sampled and determined to exceed the New York State Department of Environmental Conservation's (NYSDEC's) Unrestricted Use Soil Cleanup Objectives (SCOs). As a result, it appears that all excavated material may be disposed off-site as nonhazardous waste, as further outlined in the below paragraph; however, the actual characterization and management of the soil shall be determined by the Contractor's samples. The nature and extent of contamination within the area of work is detailed in the Soil Sample Analysis prepared for the site (refer to Appendix 2).

CONTRACT NO. 22-522
DIVISION 31 - EARTHWORK

6. All labor, materials, equipment, and incidentals to perform all work under this Section shall be included in the base bid. No separate payment will be made for any Work associated with the disposal of nonhazardous waste indicated to be included in the base bid, as the cost of said work shall be deemed included in the Contract.

B. Sources of Materials:

1. General fill materials shall be obtained from on-site excavation work and/or off-site sources.
1. Select fill materials shall be obtained from on-site excavation work and/or off-site sources.
2. Engineered fill materials shall be obtained from on-site excavation work and/or off-site sources.
3. Nonfrost susceptible fill material shall be obtained from off-site sources.
4. Crushed stone materials shall be obtained from off-site sources.
5. Topsoil, except for topsoil stripped from the work areas, shall be obtained from off-site sources.

C. Related Work Specified Elsewhere:

1. Section 02 80 00, Waste Transportation and Disposal
2. Section 03 30 00, Cast-in-Place Concrete.
3. Section 02 32 19, Exploratory Excavations (Test Pits)

1.2 QUALITY ASSURANCE

- A. Permits and Regulations: Contractor shall perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

B. Design Criteria:

1. Contractor shall be wholly responsible for installing and operating the system used to accomplish the sheeting and bracing shown on the Drawings, or otherwise required.

C. Tests:

1. An independent testing laboratory shall be employed and paid for by the Contractor to perform the required tests.

2. Required Tests:
 - a. Select Fill Samples: Gradation, ASTM D 422.
 - b. Compacted Select Fill: Compaction, ASTM D 698 and ASTM D 1556.
 - c. Optimum moisture - maximum density curve for each soil used for backfill.
 - d. Field Density Tests on each lift of backfilled material: ASTM D1556, ASTM D2167 or ASTM D6938.
3. Testing of materials for approval shall include, but shall not be limited to, the following (all tests to be performed after screening or processing of the material).
 - a. Grain size distribution in accordance with ASTM D422, including hydrometer analysis.
 - b. Characterization in accordance with ASTM D2487.
 - c. Moisture/Density relationship in accordance with ASTM D698 (Standard Proctor).
 - d. Chemical Analysis: Chemical analysis of soil shall be performed in accordance with NYSDEC Division of Environmental Remediation DER-10 (“Technical Guidance for Site Investigation and Remediation”). Analysis shall include Target Compound List (TCL) volatile organic compounds (VOCs), TCL semivolatile organic compounds (SVOCs), TCL pesticides, TCL herbicides, TCL polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, hexavalent chromium, and cyanide. Sample collection and analysis shall be in accordance with the SW-846 procedures. Sample analysis shall be performed by a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory. The results of the chemical analysis shall meet the requirements of the New York State Department of Environmental Conservation (NYSDEC) Unrestricted Use Soil Cleanup Objectives found at 6 NYCRR Part 375-6.8(a).
4. Testing laboratory will submit copies of the following reports directly to Engineer with a copy to Contractor:
 - a. Tests on borrow material.

- b. Field density tests.
- c. Optimum moisture-maximum density curve for each soil used for backfill.
- d. Results of contamination testing.

1.3 SUBMITTALS

A. Shop Drawings:

- 1. Submit, for information purposes only, shop drawings of sheeting and bracing systems for excavations deeper than five (5) feet. Information supplied shall include, as a minimum, type and size of sheeting to be used, extent of sheeting and tip and top elevations.
- 2. Shop drawings shall be prepared and signed by a Professional Engineer licensed in the State of New York.
- 3. Submit plans of open cut excavations showing limits of the excavation at grade where not shown on the Contract Drawings, where applicable.

B. Independent Testing Laboratory: Prior to conducting the required tests, the Contractor shall submit, to the Engineer, for approval, the name of the independent test laboratory which will facilitate the required testing.

C. Samples:

- 1. At least two weeks prior to the date of anticipated use, the Contractor shall submit, to the Owner, for approval, a representative sample of all on-site and off-site material required. The Contractor shall notify the Owner in writing of the source of each sample.
- 2. The Contractor shall provide, along with the above samples, the required test results, excluding the field density test.

C. Disposal Sites:

- 1. List of disposal sites for unsuitable materials and all required permits for use of the sites.

D. Manufacturer's Data: Submit for approval manufacturer's specifications, performance characteristics and operating instructions for the compaction equipment.

E. Submit Contractor's proposed methods for the management of excavated soil, including but not limited to methods for characterization, an estimate of the soil

volume to be excavated, number and locations of proposed samples and type of analyses, whether the soil will be stockpiled and sampled ex-situ or characterized in-situ so that the material can be direct loaded into the Contractor's disposal trucks or shipping containers, proposed locations for soil management areas, methods for protecting any stockpile or storage areas and preventing cross-contamination, and proposed disposal facility including the facility's sampling requirements.

1.4 JOB CONDITIONS

A. Existing Structures:

1. Shown on the Drawings are certain utilities and surface and underground structures located on or adjacent to the Work. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of the Contractor. Contractor shall explore ahead of the required excavation to determine the exact location of all structures and utilities. They shall be supported and protected from injury by the Contractor. If they are broken or injured, they shall be restored immediately by the Contractor at no additional cost to the Owner.
2. Prior to execution of the Work, the Contractor shall check and verify governing dimensions and elevations. The Contractor and Engineer shall jointly survey the condition of adjoining structures. Photographs and records shall be made of any prior settlement or cracking of structures, pavements, and the like, that may become the subject of possible damage claims.

B. Locating Underground Utilities:

1. The locations of all utilities shown on the contract drawings are based on available in-house information furnished by the Owner and utility companies and public agencies with lines and property in the vicinity of the proposed work areas and are not guaranteed to be complete or accurate. The contractor shall obtain utility markouts on all public and private properties in accordance with all local and state requirements where work under this contract is to be performed. Prior to any excavation or construction, the contractor shall notify the Owner, all utility companies and applicable agencies and request a markout of their lines and properties in the field in the area of the proposed work.
2. Schedules for maintenance of utility markouts on public and private property shall be consistent with New York State law throughout the duration of the Contract.
3. During construction/excavation, the contractor shall locate each utility by hand digging methods prior to the use of mechanical excavation equipment. During construction/excavation, if the contractor encounters evidence of suspected unmarked utilities, such as magnetic tape or other underground

markers, the contractor shall promptly determine the location of the suspected utility, if any, before proceeding with the work. The contractor shall cooperate with the Owner and the utility companies involved to avoid delay or interference of service normally performed by their lines and properties.

4. The Contractor shall take extreme caution against damaging utilities when excavating, sheeting and backfilling, during construction of test probes and test pits and while performing the work required under this Contract.
5. The contractor shall be responsible for all costs associated with pre-project construction utility survey(s)/markout(s), and utility as-builts for this project, as well as protection and hand digging operations to verify location of all utilities during construction.

C. Test Pits

1. Test pit excavation shall consist of pavement saw-cutting and removal (if applicable) and earth excavation ordered, in writing, by the Engineer for exploratory purposes to determine the location and/or depth of existing sub-surface utilities, structures, etc.
2. Material excavated from test pits can be re-used to backfill the test pit if first approved by the Engineer.
3. Existing utility systems and service lines to remain and those encountered during excavation, if damaged, shall be repaired at the Contractor's expense.
4. Existing utility systems and service lines to remain and those encountered during excavation, if damaged, shall be repaired at the Contractor's expense.

D. Existing Utilities:

1. Locate existing underground utilities in the areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.
2. Perform test pits as shown on the Contract Drawings or as directed by the Engineer or as required to perform the work.
3. Should uncharted or incorrectly charted piping or utilities be encountered during excavation, consult Owner in keeping respective services and facilities in operation. Repair damaged utilities to the satisfaction of the Engineer. Relocate or offset all utilities as required to perform the new work, at no additional cost to the Owner.

CONTRACT NO. 22-522
DIVISION 31 - EARTHWORK

4. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, except when permitted in writing by Engineer.
 5. Demolish and completely remove existing underground utilities indicated to be removed.
- E. Protection of Persons and Property:
1. Barricade open excavations occurring as part of this Work and post with warning lights. Contractor shall provide "Jersey" type concrete barriers with reflective tape where shown on the Contract Drawings or as required by roadway Owner. Operate warning lights during hours from dusk to dawn each day and as otherwise required.
 2. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by contractor's operations.
 3. Consult Engineer and obtain his approval before removing, trimming, or disturbing trees, shrubs, plants, fences, rails, walks, structures or other facilities that are encountered on the line of the excavation.
 4. Structures, utilities, sidewalks, pavements and other facilities removed or disturbed shall be replaced to their original condition, unless otherwise shown, specified or directed.
- F. Dust Control: Contractor shall conduct all of his operations and maintain the area of his activities, including sweeping and sprinkling of roadways, so as to minimize creation and dispersion of dust. In addition, Contractor shall be responsible for controlling dust caused by his operation of vehicles and equipment, clearing or for any reason whatever.
- G. Odor Control: As an odor abatement measure, cover, at the end of each work day, all areas of organic or odorous material which were exposed during excavation with a minimum 6-in and a maximum 24-in deep of clean fill. Excavated organic or odorous material shall be immediately removed off-site and shall not be stockpiled on-site.
- H. Roadways and Walks: Unless otherwise approved by Engineer, excavated material and materials of construction shall be so deposited, and the Work shall be so conducted, as to leave open and free for pedestrian traffic all crosswalks, and for vehicular traffic a roadway not less than 10 feet in width. All hydrants, valves, and other facilities which may require access during construction shall be kept accessible for use. During the progress of the Work, Contractor shall maintain such crosswalks, sidewalks, and roadways in satisfactory condition and the Work shall at all times be so conducted as to cause a minimum of inconvenience to the Owner. Temporary bituminous macadam shall be installed at all disturbed sidewalk areas until such time as the final restoration is performed.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR ALL FILL MATERIAL

- A. All fill material shall be virgin, clean inert, well graded material that is free of refuse and vegetable matter, frozen material and other objectionable material.
- B. Excavated materials meeting these requirements and the requirements stipulated below for the appropriate type of fill material shall be used when approved by the Engineer. Otherwise the Contractor shall excavate, haul and place material from approved off-site sources.
- C. All materials for fill shall be environmentally clean material conforming to the requirements of NYSDEC Unrestricted Use Soil Cleanup Objectives found at 6 NYCRR Part 375-6.

2.2 SOIL MATERIALS

- A. Engineered Fill: Well graded granular material or bank run gravel, free from organic matter and shall conform to the following gradation:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
3-inch	100
1/4-inch	100
No. 40	5-50
No. 200	0-10

- B. Structural Fill and Select Fill: Well graded granular material or bank run gravel, free from organic matter conforming to the requirements of NYSDOT Section 203-2.02C and shall conform to the following gradation:

<u>Sieve Size</u>	<u>Percent Passing by Weight</u>
4-inch	100
No. 40	0-70
No. 200	0-15

- 1. Fines passing No. 200 shall be non-plastic
- 2. Particle size shall show no gap grading
- C. General Fill: Soil materials for general backfill and fill shall be free of organics, clay, rock or gravel larger than 6 inches in any dimension, debris, waste, frozen materials and other deleterious matter. No more than 30 percent by weight shall pass through a No. 200 sieve except for topsoils.

- D. Granular embedment: Crushed rock or pea gravel with not less than 95 percent passing a 1/2-inch sieve, not less than 95 percent retained on a No. 4 sieve and maximum 5 percent passing a No. 10 sieve.
- E. Crushed stone, as specified on the drawings, shall be a naturally or artificially graded mixture of crushed gravel, crushed stone, meeting the material requirements for NYSDOT Standard Specifications, latest revision, Section 703-02, Table 703-2, size No. 1 and 2 as indicated, meeting gradation requirements of Section 703-04, Type 2.
- F. Pea Gravel: Pea gravel shall consist of clean naturally rounded aggregate with a range of particles between 1/8 inch and 3/4 inch in conformance with gradation requirements of ASTM C-33. The material shall not have more than 3% passing a #8 sieve. Deleterious substance limitations and soundness shall conform to requirements of ASTM C-33.
- G. Unsuitable Material: All soils not meeting the requirements of Paragraphs 2.2A. through 2.2B and all organic materials.

2.3 REMOVAL OF WATER

- A. The Contractor's attention is directed to the fact that some of the work and structures may be below groundwater. Therefore, the need for an adequate and well-planned dewatering system is essential to allow excavation and concrete construction to be performed in a dry suitable environment.
- B. The Contractor, at all times during construction, shall provide and maintain ample means and suitable equipment, consistent with conditions encountered, with which to promptly remove and properly dispose of all water entering excavations or other parts of the work. All excavations shall be kept dry at all times until the structures to be built therein are completed and backfilled to approximately final grades except where otherwise approved by the Engineer in writing. Concrete for structures, pipe and sanitary structures shall be placed on subgrades which are dry. Water shall be disposed of in a suitable manner so as to avoid damage to adjacent property, existing structures and all work under construction. It shall be the Contractor's responsibility to prevent flotation of any structures during construction.
- C. Systems used to lower the groundwater level shall be maintained in operation continuously, twenty-four hours a day, seven days a week, until the structures are completed adequately to prevent flotation. Termination of the dewatering operation shall receive approval of the Engineer.
- D. No additional compensation will be given to the Contractor because of damage from flooding caused by groundwater or surface waters rising above ground elevations.

CONTRACT NO. 22-522
DIVISION 31 - EARTHWORK

- E. The Contractor shall be responsible for obtaining and adhering to all provisions of necessary dewatering permits at no additional costs to the Owner. Groundwater shall not be permitted to be discharged into storm drains or surface waters without proper approval from regulatory agencies.
- F. Dewatering system shall be installed as required to lower the groundwater level in general excavation at least 2 feet below final subgrade.
- G. In order to limit the size of the area affected by dewatering, the use of deep wells shall be prohibited.
- H. Prior to installing and operating any dewatering system, the Contractor shall install a series of observation wells and monitor same for a minimum period of 2 working days in order to determine the groundwater level at the time of construction. The observation wells shall be located both within and adjacent to the proposed construction site. Observation wells located within the limits of the proposed construction site shall be situated outside of the physical limits of the structures and protected from damage. Any damaged observation wells shall be replaced or repaired. During construction, the water level in the observation wells shall be measured and recorded periodically.

2.4 SHEETING, SHORING, AND BRACING

- A. Wood Sheeting:
 - 1. Temporary Work: New or used timber meeting the requirements for Douglas Fir Dense Construction grade or Southern Pine No. 2 Dense S3.
 - 2. Permanent Work: New pressure creosoted timber or copper chrome arsenate treated wood.
- B. Steel Sheeting:
 - 1. Temporary Work: Steel conforming to ASTM A 328. Steel for soldier piles, wales and braces may be new or used and shall conform to ASTM A 36.
 - 2. Permanent Work: New rolled steel sections of the continuous interlocking type, conforming to ASTM A 328.
- C. Used materials shall be in good condition, not damaged or excessively pitted.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Contractor shall provide Engineer with sufficient time and means to examine the areas and conditions under which excavating, filling, and grading are to be performed. Work shall not proceed until all unsatisfactory conditions have been corrected in a manner acceptable to Engineer.

3.2 EROSION CONTROL

A. General:

1. In general, the construction procedures outlined herein shall be implemented to ensure minimum damage to the environment during construction.
2. Whenever possible, access and temporary roads shall be located and constructed to avoid environmental damage. Provisions shall be made to regulate drainage, avoid erosion and minimize damage to vegetation. Special care shall be taken to eliminate depressions that could serve as mosquito pools.
3. Where areas must be cleared for storage of materials or temporary structures, provisions shall be made for regulating drainage and controlling erosion, subject to Engineer's approval.
4. In the event of any temporary work stoppage, the Contractor shall take steps to prevent any temporary or permanent environmental damage to the area undergoing construction.

B. Control Measures:

1. Temporary measures shall be applied to control erosion and to minimize the siltation of the existing drains, streambeds and natural ponding areas. Such measures shall include but not be limited to the use of berms, baled straw silt barriers, gravel or crushed stone, mulch, grasses, slope drains and other methods. These temporary measures shall be applied to erodible materials exposed by any activities associated with the construction of this Project.
2. Temporary measures shall be coordinated with the construction of permanent drainage facilities and other work to the extent practicable to assure economical, effective, and continuous erosion and siltation control.
3. The Contractor shall provide special care in areas with steep slopes. Disturbance of vegetation shall be kept to a minimum to maintain stability. Remove only those trees and shrubs and grasses that must be removed for construction. Protect the rest to preserve their aesthetic and erosion-control values.

4. Install erosion and sediment control practices as specified herein and according to soil conservation standards and specifications. The practices shall be maintained in effective working condition during construction and until the drainage area has been permanently stabilized.
5. Temporarily stabilize each segment of graded or otherwise disturbed land, including the sediment-control devices not otherwise stabilized by seeding and mulching or by mulching alone.

3.3 EXCAVATION

A. General:

1. Contractor shall perform all excavation required to complete the Work as shown and specified. All material excavated shall be nonclassified. It shall include all materials such as earth, sand, clay, gravel, hardpan, boulders, organic materials, decomposed rock, pavements, concrete, rubbish and all other materials within the excavation limits.
2. Excavations shall be open type, shored and braced as shown on the plans and where necessary to prevent injury to workmen and to new and existing structures or pipelines.
3. All excavations shall be made in the dry.
4. Dispose of excavated material and waste materials as specified herein under Disposal of Excavated Material.

B. Pipeline Excavation:

1. Pipe trenches shall be excavated below the pipe bottom by an amount sufficient for placement of the pipe bedding shown on the drawings and as specified. No more than 50 feet of trench may be opened in advance of pipe laying.
2. Trench width shall be minimized to greatest extent practical but shall conform to the following:
 - a. Sufficient to provide room for installing, jointing and inspecting piping, but in no case wider than that indicated in the Contract Drawings.
 - b. Enlargements at pipe joints may be made if required and approved by Engineer.
 - c. Sufficient for sheeting, bracing and sloping.

- d. Sufficient to allow thorough compacting of granular embedment adjacent to bottom half of pipe.
 - e. Do not use excavating equipment which requires the trench to be excavated to excessive width.
3. At road crossings, trenching width shall be minimized by the use of sheeting, trench boxes or similar protection methods.

C. Manhole Excavation:

1. Excavation shall be made to the grades shown on the Contract Drawings and to such widths as will give suitable room for construction of the manholes, for bracing and supporting, pumping and draining. The bottom of the excavations shall be rendered firm and dry and in all respects acceptable to the Engineer.
2. Excavation shall be accomplished by methods which preserve the undisturbed state of subgrade soils.
3. Excavation equipment shall be satisfactory for carrying out the work in accordance with the Specifications. Earth shall not be plowed, scraped, or dug with machines so near to the finished subgrade as to result in excavation of, or disturbance of material below grade.
4. When excavation for foundations has reached final depths, the Engineer shall be notified and will inspect conditions. If materials and conditions are not satisfactory to the Engineer, the Engineer will issue instructions as to the procedures for correction of the unsatisfactory condition.
5. During final excavation to subgrade level, take precautions required to prevent disturbance of material. Hand excavate the final 6-in as necessary to obtain a satisfactory undisturbed bottom.

D. Unsuitable Excavation:

1. If any over excavation occurs through error of the Contractor or for the Contractor's convenience, it shall be refilled at the Contractor's expense with concrete, select fill or other material satisfactory to the Owner. The Contractor shall be held solely responsible for costs associated with characterizing, transporting and disposing the excavated material off-site in accordance with all applicable federal, state and local laws and regulations, as well as the requirements of these Contract Documents.

CONTRACT NO. 22-522
DIVISION 31 - EARTHWORK

2. If Contractor fails to properly dewater the excavation or trench, or disturbs the subgrade or otherwise fails or neglects to conduct the excavation work in a manner that provides surface of subgrade in proper condition for construction, the Contractor shall remove all disturbed material and replace it with concrete, select fill, or other approved material at his own expense. The condition of the subgrade shall meet with the approval of the Owner before any work is placed thereon.
 3. If, in the opinion of the Engineer, the material, in its undisturbed natural condition, at or below the grade of the excavation indicated on the Drawings is unsuitable for foundations, or if organic or silty soil extends below excavation depth, it shall be removed to such depth and width as the Engineer may direct and be replaced with select fill or other suitable material as directed by the Engineer. Compensation will be in accordance with the Agreement or applicable unit price bid.
- E. Additional Excavation:
1. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material with structural fill or other material as approved by Geotechnical Engineer.
 2. Removal of unsuitable material, and its replacement as directed, will be paid on basis of Contract conditions relative to changes in work.
- F. Excavation for Structures:
1. Conform to elevations and dimensions shown on the drawings, within a tolerance of plus or minus 0.10', and extending a sufficient distance from footings and foundations to permit placing and removing concrete formwork, installation of services, other construction, and for inspection.
 2. In excavating for footings and foundations, take care not to disturb the bottoms of the excavation. Excavate by hand to a final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave a solid base to receive concrete.
 3. Sloping surfaces under footings and foundations, or other work where required, shall be cut in steps as indicated on the Drawings or as directed by the Engineer.
- G. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F. (1 degree C.).

3.4 SHEETING, SHORING AND BRACING

A. General:

1. Sheeting, shoring and bracing shall be used where necessary to prevent injury to workmen, structures, or pipe lines.
2. All municipal, county, state and federal ordinances, codes, regulations and laws shall be observed. All excavations shall be shored with the minimal protection of sheeting listed in OSHA Regulations, 29 CFR, Part 1926, Subpart P - Excavations, Trenching and Shoring.
3. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Carry down shoring and bracing as excavation progresses.
4. Unless otherwise shown, specified, or ordered, all materials used for temporary sheeting shall be removed when work is completed. Such removal shall be made in a manner not injurious to the structure or its appearance or to adjacent Work.
5. Provide permanent sheeting as shown. Cut off tops as required, but at least 2-feet below finished grade.
6. The clearances and types of the temporary sheeting, insofar as they affect the character of the finished Work, will be subject to the approval of the Engineer but the Contractor shall be responsible for the adequacy of all sheeting, shoring, bracing and other related Work.
7. Safe and satisfactory installation of the sheeting shall be the entire responsibility of the Contractor.

B. Sheeting Left in Place:

1. Steel sheet piling to be left in place (where directed by the Engineer) shall be driven straight to the lines and grades shown or directed. The piles shall penetrate into firm materials with secure interlocking throughout the entire length of the pile. Damaged piling having faulty alignment shall be pulled and replaced by new piling.
2. The type of guide structure used and method of driving steel sheet piling to be left in place shall be subject to the approval of the Engineer.
3. Contractor shall cut off piling left in place to the grades shown or ordered by the Engineer and shall remove the cut offs from the site.

4. Contractor shall thoroughly clean wales, braces and all other items to be embedded in the permanent structure, and shall make provisions that the concrete surrounding the embedded element is sound and free from air pockets or harmful inclusions. The provisions shall include the cutting of holes in the webs and flanges of wale and bracing members, and the welding of steel diaphragm waterstops perpendicular to the centerline of brace ends which are to be embedded.
5. Subsequent to removal of the inside face forms, and when removal of bracing is permitted, steel shall be cut back at least 2 inches inside the wall face and the opening patched with cement mortar. The concrete shall be thoroughly worked beneath wales and braces, around stiffeners and in any other place where voids may be formed.

C. Removal of Sheeting and Bracing:

1. Remove sheeting and bracing from excavation unless otherwise shown on the Drawings or ordered in writing by the Engineer. Removal shall be done so as to not cause injury to the Work. Removal shall be equal on both sides of excavation to ensure no unequal loads on pipe or structure. Use of vibratory extractors is prohibited.
2. Defer removal of sheeting and bracing, where removal may cause soil to come into contact with concrete, until wall and floor framing up to and including grade level floors are in place and concrete has attained sufficient strength to withstand the soil and superimposed loads.

3.5 STRUCTURAL FILL, BACKFILL, AND COMPACTION

- A. Place fill materials in the types and thicknesses as detailed on the Drawings. All backfill shall be Select Fill unless otherwise directed by the Engineer, or shown on the Drawings.
- B. Fill excavations as promptly as Work permits, but not until completion of the following:
 1. Acceptance by Engineer of all Work within the excavation.
 2. Inspection, testing approval, and recording of locations of underground utilities, connections, branches, structures and other facilities.
 3. Removal of temporary shoring and bracing, and backfilling of voids with satisfactory materials.
 4. Removal of trash and debris.

CONTRACT NO. 22-522
DIVISION 31 - EARTHWORK

- C. Excavation shall be kept dry during backfilling operations. Backfills around piping and structures shall be brought up evenly on all sides.
- D. All structures and pipe trenches shall be backfilled with the type of material listed below except where shown otherwise on the Contract Drawings.

<u>Type of Backfill</u>	<u>Location</u>
Select Fill	Replacement of unsuitable material removed below bottom slabs of structures and manholes, below pipe beddings, and where shown on the drawing.
Granular Embedment Material	Pipe bedding and backfill within the pipe zone. The pipe zone extends from the bottom of the trench to six (6) inches above the top of the pipe for pipes thirty (30) inches and smaller, and to twelve (12) inches above the top of the pipe for pipes greater than thirty (30) inches in diameter.
Crushed Stone	In locations shown on the drawings.
Rip Rap	In locations shown on the drawings.
Pea Gravel	In locations shown on the drawings.
Common/General Fill	In all locations not enumerated above.

- E. Backfill above and adjacent to pipe shall be compacted by light weight equipment, such as "walk behind" vibratory plate compactors. Heavy self-propelled compactors shall not be used until the following criteria are met:
 - 1. A minimum of 18 inches of compacted backfill has been placed above the top of the pipe.
 - 2. Area to be compacted is a minimum distance of three pipe diameters away from the adjacent pipe.
 - 3. Area to be compacted is a minimum of 10 feet from building and tank walls and riser pipes.
- F. Hydro hammers or "jumping jack" hammers shall not be used above pipes until a minimum of 3 feet of backfill has been placed and compacted.
- G. After approval of the subgrade by the Geotechnical Engineer, the geotextile shall be placed, where shown on the Drawings, upon the subgrade in accordance with the manufacturer's instructions and the following:

CONTRACT NO. 22-522
DIVISION 31 - EARTHWORK

1. After acceptance of the subgrade, the fabric shall be installed prior to placement of the first course of compacted structural fill, stone or subbase.
 2. Geotextile may be joined by either sewing or overlapping. Sewn seams shall be lapped a minimum of 4 inches and double sewn with nylon or polypropylene. Overlapping seams shall have a minimum overlap of 18 inches, except where placed underwater where the overlap shall be a minimum of 3 feet.
 3. Fabric which is torn or damaged shall be replaced or patched. The patch shall extend 3 feet beyond the perimeter of the tear or damage.
 4. Traffic or construction equipment shall not be permitted directly upon the fabric. Maintain a minimum of 8 inches loose thickness of aggregate above the stabilization fabric subject to traffic.
- H. Place backfill and fill materials in layers not more than 12" in loose depth. Lift height shall be governed by the ability of the compaction equipment to obtain the required compaction with 12" as a maximum lift height. Before compaction, moisten or aerate each layer as necessary to facilitate compaction to the required density. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost, ice, ponded water or extraneous debris.
- I. When work is suspended during periods of freezing weather, measures shall be taken to prevent fill already in place from freezing. Upon resumption of work after any inclement weather, prepare the exposed surface by proof rolling to identify any zones of soft/loose soils. Soft/loose materials or frozen soils shall be removed and replaced at the Contractor's expense.
- J. Moisture Control:
1. Where fill or backfill must be moisture conditioned before compaction, uniformly apply water to the surface and to each layer of fill or backfill. Prevent ponding or other free water on surface subsequent to, or during, compaction operations.
 2. Remove and replace, or scarify and air dry, soil that is too wet to permit compaction to specified density. Soil that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing, until moisture content is reduced to a value which will permit compaction to the percentage of maximum density specified.
- K. All fill shall be thoroughly and satisfactorily compacted to 95 percent of the maximum density of material used.

CONTRACT NO. 22-522
DIVISION 31 - EARTHWORK

- L. If the surface of any layer becomes contaminated by mud or unsuitable materials, the contaminated soil shall be removed.
- M. Fill placement shall be suspended when wet weather prevents proper operation of compaction equipment.
- N. Adjacent to structures, fill shall be placed in a manner which will prevent damage to the structures and will allow the structures to assume the loads from the fill gradually and uniformly. The height of the fill adjacent to structure shall be increased at approximately the same rate on all sides of the structure.
- O. No backfilling or compaction shall take place against any cast-in-place concrete footings or slabs prior to 7 days initial concrete set, or against any cast-in-place concrete walls prior to achieving the desired design strength, f'c.
- P. Heavy equipment shall not be operated within 4 feet of any structure. Heavy vibratory compactors shall not be operated within 4 feet of any structure.
- Q. Excavated material meeting the requirements of Select Fill shall be spread and allowed to dry until obtaining the required moisture content prior to re-use.

3.6 FIELD QUALITY CONTROL

- A. Notify the Engineer at least one (1) working day in advance of all phases of filling and backfilling operations.
- B. Compaction testing shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with the following methods:
 - 1. In-place relative density:
 - a. Method: AASHTO T191, Sand Cone Method
AASHTO T238, Nuclear Method
- C. Foundation Subbase: Perform one (1) field density test, in each compacted fill lift, for the following:
 - 1. Each isolated spread footing.
 - 2. Each 20 feet or less of continuous footing, but no fewer than two tests along a wall.
 - 3. Each 2,000 sq. ft. of structural base slab and/or slabs on grade, but in no case fewer than three tests.

- D. Foundation Wall Backfill: In each compacted backfill layer, perform at least one field in-place density test for each 50 feet or less of wall length, but no fewer than two tests along a wall face.
- E. The Engineer may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions, at the Contractor's expense.
- F. Acceptance Criteria: The sole criterion for acceptability of in-place fill shall be in situ dry density. Minimum dry density for all fill or backfill shall be 95 percent of the maximum dry density in accordance with ASTM D 698. If a test fails to qualify, the fill shall be further compacted and re-tested. Subsequent test failures shall be followed by removal and replacement of the material.
- G. Crushed stone shall be compacted with a vibratory plate compactor or vibratory rolling compactor. Three complete passes shall be made on each 8 inch thick loose layer of stone. Such passes shall overlap the adjacent previously compacted area a minimum of 20%. Density requirement for crushed stone will be considered satisfactory upon completion of compaction.
- H. If the tests indicate unsatisfactory compaction, the Contractor shall provide the additional compaction necessary to obtain the specified degree of compaction. All additional compaction work shall be performed by the Contractor at no additional cost to the Owner until the specified compaction is obtained. This Work shall include complete removal of unacceptable fill areas and replacement and recompaction until acceptable fill is provided, as determined by the Engineer.

3.7 GRADING

- A. Uniformly grade areas within limits of the Work, including adjacent transition areas. Smooth subgrade surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.
- B. Pavements: Shape surface of areas under pavements to the line, grade and cross-section shown, with finish surface not more than 1/2 inch above or below the required subgrade elevation.
- C. Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/4 inch when tested with a 10 foot straightedge.
- D. Compaction: After grading, compact subgrade surfaces to the depth and percentage of maximum density required.

3.8 CONTAMINATED MATERIALS STORAGE

- A. Excavated material shall be placed in temporary storage or transported off-site for disposal immediately after excavation. Temporary storage areas shall be located within the property line of the Site and shall be delineated by the Contractor in its approved submittals. Storage areas shall be in good condition and constructed of materials that are compatible with the material or liquid to be stored. Each storage area shall be clearly labeled with an identification number and a written log shall be kept to track the source of contaminated material in each area.
- B. Storage of excavated material outside the designated soil staging areas is prohibited without prior written approval by the Owner.
- C. The following methods of storage are acceptable:
 - 1. Stockpiles
 - a. Excavated materials shall be stockpiled in the areas noted in the Contractor's approved submittals. Stockpiles shall be located 10 feet or greater from property lines.
 - b. Stockpiles shall be constructed to isolate stored contaminated material from the environment. The maximum stockpile height shall be 10 feet. Each stockpile shall be labeled with an identification number identifying the material stored within the stockpile.
 - c. Diversion measures shall be employed to prevent storm water run-on and run-off. A sealed geomembrane liner and cover shall be used to prevent cross-contamination of existing ground surface, precipitation from entering the stockpile and emissions and dust from escaping. The minimum thickness of the geomembrane liner shall be 40 mils and the sealed geomembrane cover shall be 20 mils. Control measures such as wetting the stockpile surfaces shall be employed to suppress dust. Only potable water shall be used for this purpose.
 - 2. Roll-off Units
 - a. Roll-off units may be used for temporary storage in lieu of stockpiling the material.
 - b. Roll-off units used to temporarily store contaminated material shall be watertight. A cover shall be placed over the units to prevent precipitation from contacting the stored material. Liquid which collects inside the units shall be removed and disposed off-site in accordance with all applicable federal, state and local laws and regulations.

CONTRACT NO. 22-522
DIVISION 31 - EARTHWORK

- D. Storage and handling of contaminated soil must comply with all applicable NYSDEC solid waste regulations (6 NYCRR Part 360) and hazardous waste regulations (6 NYCRR Parts 370-376).
- E. Excavated soil may not be stored on-site for a period greater than 30 days from being removed from the ground.
- F. Spillage shall be minimized and contained for later off-site disposal in accordance with all applicable federal, state and local regulations.
- G. All materials used to protect underlying soil and adjacent areas during the soil removal and handling activities must be properly characterized and removed for proper off-site disposal in accordance with all applicable federal, state and local laws and regulations following completion of these activities. The Contractor shall obtain the Owner's approval of the waste characterization and the disposal facility prior to any waste being transported off-site.

3.9 DISPOSAL OF EXCAVATED MATERIALS

- A. No excavated materials suitable for common or select fill shall be removed from the site or disposed of by the Contractor except as directed by the Owner. Materials shall be neatly piled at designated locations on-site.
- B. Organic material and material which does not conform to the requirements for backfill shall be disposed of in compliance with these specifications.
- C. Contractor shall not dump soil onto those areas designated as wetlands or waterways. Contractor shall not stockpile or store spoil, materials, tools or equipment on wetlands.

3.10 RESTORING AND RESURFACING EXISTING ROADWAYS AND FACILITIES

- A. Pavement, gutters, curbs, walks, driveways and roadways disturbed or damaged by the Contractor's operations shall be restored or replaced by him to original or better condition.
- B. After all other work has been completed in each area not to be paved, place and grade topsoil to a depth of not less than 6-inches.

3.11 ENVIRONMENTAL PROTECTION AND RESTORATION

- A. See Section 01 57 19 for requirements pertaining to additional environmental controls required.

++ END OF SECTION ++

SECTION 31 05 16

AGGREGATES FOR EARTHWORK

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall provide labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install aggregate materials.

B. Related Sections:

1. Section 31 23 17, Trenching and Backfilling
2. Geotechnical reports; Included in the Appendices
 - a. These reports are for informational purposes only and should not be considered part of the contract documents. The opinions expressed in this report are those of the Geotechnical Consultant and represent his interpretation of the subgrade conditions, tests, and the results of analysis which he has conducted. Should the data contained in the report not be adequate for the Contractor's purposes, the Contractor may make, prior to bidding, his own investigation, tests, and analysis.

1.2 REFERENCES

A. American Association of State Highway and Transportation Officials:

1. AASHTO M147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses.
2. AASHTO M288 - Standard Specification for Geotextile Specification for Highway Applications.
3. AASHTO T180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop.

B. ASTM International:

1. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. ASTM D698 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³).
3. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³).
4. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
5. ASTM D4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

C. NYSDOT Standard Specifications, Section 703, latest revision.

1.2 QUALITY ASSURANCE

- A. Furnish each aggregate material from single source throughout the Work.
- B. Perform Work in accordance with NYSDOT Standard Specifications, latest revision.

1.3 SUBMITTALS

- A. Materials Source: Submit name of imported materials suppliers.
- B. Manufacturer's Certificate: Certify Products meet or exceed requirements specified on the Drawings.

PART 2 - PRODUCTS

2.1 COARSE AGGREGATE MATERIALS

- A. Coarse aggregate, as specified on the drawings, shall be in accordance with NYSDOT Standard Specifications, latest revision, Section 703-02 "Course Aggregates"

2.2 FINE AGGREGATE MATERIALS

- A. Fine aggregate, as specified on the drawings, shall be in accordance with NYSDOT Standard Specifications, latest revision, Section 703-01 "Fine Aggregate".

2.3 SELECT GRANULAR FILL

- A. Select Granular fill in accordance with the gradation set forth in NYSDOT Standard Specifications, latest revision, Section 713-11 and Table 733-11A.

2.4 CLEAN COURSE ANGULAR GRAVEL

- A. Clean course angular gravel shall be max 3/4-inch stone as approved by the Engineer.

2.5 CRUSHED STONE MATERIALS

- A. Crushed stone, as specified on the drawings, shall be naturally or artificially graded mixture of crushed gravel, crushed stone, meeting the material requirements for NYSDOT Standard Specifications, latest revision, Section 703-02, Table 703-2, size No. 1 and 2 as indicated, meeting gradation requirements of Section 733-04, Type 2

2.6 BEDDING SAND MATERIALS

- A. Sand Bedding, as specified on the drawings, shall be ASTM C33, fine aggregate, natural, or manufactured sand.

2.7 ACCESSORIES

- A. Geotextile Fabric: AASTHO M288; non-woven, polypropylene.

2.8 SOURCE QUALITY CONTROL

- A. Material Testing and Analysis shall be performed with the requirements specified in the NYSDOT Standard Specifications, latest revision.
- B. When tests indicate materials do not meet specified requirements, change material and retest.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Remove excess excavated materials, coarse aggregate materials, and fine aggregate materials not intended for reuse, from site.

- B. Remove excavated materials not meeting requirements for coarse aggregate materials, and fine aggregate materials from site.

3.2 STOCKPILING

- A. Stockpile materials on site at locations indicated on the plans and as designated by the Engineer.
- B. Stockpile in sufficient quantities to meet Project schedule and requirements.
- C. Separate different aggregate materials with dividers or stockpile individually to prevent mixing.
- D. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.3 STOCKPILE CLEANUP

- A. Remove stockpile, leave area clean restored to original condition.

++ END OF SECTION ++

SECTION 31 10 00

DEMOLITION AND SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Site Demolition:

1. Demolition of site improvements including, but not limited to, paving, curbing, sidewalks, fencing, gates and existing building foundations.
2. Demolition of abandoned building foundations and associated utilities, in whole or in part, as shown on the Drawings.
3. Protection of site work and adjacent structures.
4. Pollution control during demolition, including noise control.
5. Removal and legal disposal of materials.
6. Dismantled items to be retained by the Owner.
7. Dismantled items to be reinstalled.

1.2 SUBMITTALS

- A. Clearing Plan: Submit list of proposed operations, and identify site improvements and features to remain. Include proposed location for stockpiles.
- B. Schedule: Submit for approval selective demolition schedule, including schedule and methods for maintaining existing utility service.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Use experienced workers.

1.4 PROJECT CONDITIONS

- A. Immediate areas of work will not be occupied during selective demolition. The public, including children, may occupy adjacent areas.
- B. No responsibility for buildings and structures to be demolished will be assumed by the Owner.

1.5 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 01 33 00, Submittal Procedures
- B. Section 01 74 00, Cleaning and Waste Management:

PART 2 - PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 - EXECUTION

3.1 SITE CLEARING OPERATIONS

- A. Protection of existing trees, vegetation, landscaping and site improvements not scheduled for clearing which might be damaged by construction activities.
- B. Trimming of existing trees and vegetation as recommended by arborist for protection during construction activities.
- C. Clearing and grubbing of stumps and vegetation, and removal and disposal of debris, rubbish, designated trees, and site improvements. This includes removal of tree stumps on-site from previous tree removals.
- D. Topsoil stripping and stockpiling.
- E. Temporary erosion control, siltation control and dust control.
- F. Temporary protection of adjacent property, structures, benchmarks and monuments.
- G. Temporary relocation of play structures, fencing and site improvements scheduled for reuse.
- H. Watering of trees and vegetation during construction activities.
- I. Removal and legal disposal of cleared materials.

3.2 DEMOLITION

- A. Do not damage building elements and improvements indicated to remain. Items of salvage value, not included on schedule of salvage items to be returned to Owner, shall be removed from site. Storage or sale of items at project site is prohibited.
- B. No explosives are permitted.
- C. Do not close or obstruct streets, walks, drives or other occupied or used spaces or facilities without the written permission of the Owner and the authorities having jurisdiction. Do not interrupt utilities serving occupied or used facilities without the

CONTRACT NO. 22-522
DIVISION 31 – EARTHWORK

written permission of the Owner and authorities having jurisdiction. If necessary, provide temporary utilities.

- D. Cease operations if public safety or remaining structures are endangered. Perform temporary corrective measures until operations can be continued properly.
- E. Provide adequate protection against accidental trespassing. Secure project after work hours.
- F. Restore finish of patched areas.

END OF SECTION

NO TEXT ON THIS PAGE

SECTION 31 23 16.26

ROCK REMOVAL

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope:

1. This Section includes drilling, excavation, removal and disposal of rock as necessary for the installation of the Work, and as indicated and specified herein. Contractor shall refer to the Geotechnical Report included in Appendix 1 of the Technical Specifications for rock locations and suggested removal operation.

1.2 DEFINITIONS

A. Rock: Limestone, sandstone, shale, granite, quartz, and formations of other varying mineral or aggregate composition in solid beds or masses in its original or stratified position that exceed 1 cubic yard and that cannot be excavated with one of the following:

1. A crawler tractor having a minimum draw bar pull rated at not less than 71,000 pounds (Caterpillar D9N or equivalent) and occupying an original volume of at least 1 cubic yards or more.
2. A backhoe having a break out force rated at not less than 44,000 pounds (Caterpillar 235D or equivalent) and occupying an original volume of at least 1 cubic yards.

B. Rock Excavation: Removal of rock by means of drilling (exclusive of pile installation), or use of pneumatic tools or expansive chemical agents. Removal of materials which, in the opinion of the Engineer, can be loosened and excavated by mechanical means (ripping, etc.) including frozen materials, soft laminated shale or hardpan, pavements, curbs and similar materials shall be classified as earth excavation with the exception of rock face scaling. Contractor shall provide / include the following within Rock Excavation costs:

1. Survey of excavation(s) shall be provided by the Contractor. On-site Engineer will be responsible for survey confirmation and accuracy.
2. Contractor shall not proceed with the excavation of material until cross sections have been taken and the Engineer has classified (verified) the materials as common excavation or rock excavation.

3. Failure on the part of the Contractor to uncover such material, notify the Engineer, and allow ample time for classification and cross sectioning of the undisturbed surface of such material will cause the forfeiture of the Contractor's right of claim to any classification or volume of material to be paid for other than that allowed by the Engineer for the areas of work in which such deposits occur.
- C. Unauthorized Excavation: Removal of any material beyond horizontal and vertical limits indicated on the Drawings or as specified herein, without the prior approval of the Engineer.
- D. Scaling: Scaling shall be considered the removal of loose and broken rock from the face of rock cuts by mechanical means. Scaling shall be included in Rock Excavation item as defined above.
- E. Pile Installation: Rock drilling, removal and disposal specifically for the installation of piles will not be considered rock removal.

1.3 REGULATORY REQUIREMENTS

- A. Comply with the applicable requirements of the Code of Federal Regulations Title 29 - Labor, Part 1926 Safety and Health Regulations for Construction (OSHA).

1.4 SUBMITTALS

- A. General:
 1. Submit Specialty Contractors' qualifications, to the Engineer for approval.
 2. Submit work plans, site safety plans, proposed equipment, and a detailed outline of intended rock removal procedures and any other information listed in this specification to the Engineer for approval. This submittal shall not relieve the Contractor of complete responsibility for the successful performance of the method(s) used.
- B. Site Safety Plan:
 1. Site safety shall be coordinated through the Contractor's office. A written safety plan shall be developed and distributed to all subcontractors, the Owner and the Engineer.
- C. Certifications/Licenses:
 1. One (1) copy of each certificate, license, permit, and proof of insurance required by this specification shall be submitted to the Engineer after award

of contract and prior to commencement of work.

1.5 PROJECT/SITE CONDITIONS

- A. Existing Conditions: Existing physical conditions as defined for design purposes are noted on the Drawings and are described in the Information Available to Bidders section of the Contract Documents.

1.6 MAINTENANCE

- A. Any and all damage caused by the Rock Removal operations shall be repaired or replaced to the property Owner's and Engineer's satisfaction at the expense of the Contractor.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION

3.1 ROCK REMOVAL

- A. Remove rock as indicated by the Drawings and as necessary for the installation of the Work. Provide sufficient clearance, within the limits specified, for the proper execution of the Work.
- B. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
 - 1. 24 inches outside of concrete forms other than at footings.
 - 2. 12 inches outside of concrete forms at footings.
 - 3. 6 inches outside of minimum required dimensions of concrete cast against grade.
 - 4. Outside dimensions of concrete walls indicated to be cast against rock without forms or exterior waterproofing treatments.
 - 5. 6 inches beneath bottom of concrete slabs on grade.
 - 6. 6 inches beneath pipe in trenches, and the greater of 24 inches wider than pipe or 42 inches wide.
 - 7. 12 inches outside of stone construction entrance limits as shown on plans.
- C. Fill areas of over-excavated rock to the proposed subgrade elevations as required

CONTRACT NO. 22-522
DIVISION 31 – EARTHWORK

by Drawings with selected fill in accordance with Section “Trenching and Backfilling” or Section “Earthwork” Over-excavation beneath foundations shall be filled with footing concrete ($f'c$ = concrete compressive= 3000 psi minimum).

- D. All rock slopes shall be thoroughly scaled to the satisfaction of the Engineer. Scaled rock slopes shall be stable and free from possible hazards of falling rocks or rock slides that endanger public or worker safety. If such conditions exist after proper scaling, remedial treatment shall be provided by the Contractor at no additional expense to the Owner. In the event that natural conditions such as wedge instability are encountered, remedial treatment shall be provided as necessary to stabilize the rock slope. Such treatment may include, but is not necessarily limited to, rock bolting or grouting, shoring, or shotcreting. Large scale ripping shall not be permitted within 10 feet of any final rock slope prior to presplitting or line drilling.
- E. Blasting will not be permitted.

3.2 EXCAVATION TOLERANCES

- A. Rock removal limits shall include all materials defined as rock whether removal is accomplished by mechanical means (ripping, etc.) or by drilling.

++ END OF SECTION ++

SECTION 31 23 33

TRENCHING AND BACKFILLING

PART 1 – GENERAL

1.1 DESCRIPTION

- A. This Section includes the excavation of trenching, backfilling, compacting, dewatering, excavation support and disposal, as shown on the Contract Drawings, and as herein specified.
- B. The Engineer will determine the suitability of materials that are to be used in the work and should any materials encountered be unsatisfactory for the purpose intended, they shall be removed from the site at the Contractor's expense.

1.2 REFERENCES

- A. Standards referenced in this Section shall be the latest edition of the following standards:
 - 1. Standard Specifications, Construction and Materials, New York State Department of Transportation, Office of Engineering.
 - 2. Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO).
 - 3. American Society for Testing and Materials (ASTM).
- B. The Contractor shall comply with the requirements for soil erosion and sedimentation control and other requirements of governmental authorities having jurisdiction, including the State.
- C. The Contractor shall provide and pay for all costs in connection with an approved independent testing facility to determine conformance of soils and aggregate with the specifications in accordance with Section Quality Requirements.

1.3 QUALITY ASSURANCE

- A. Notify the Engineer of any unexpected subsurface condition.
- B. Protect excavations by shoring, bracing, sheet piling, or by other methods, as required to ensure the stability of the excavation. Comply with OSHA requirements.
- C. Underpin or otherwise support structures adjacent to the excavation, which may be damaged by the excavation. This includes service lines.
- D. Protection of Existing Utilities:

1. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations. Comply with OSHA requirements.
 2. Coordinate interruption and/or termination of utilities with the utility companies and the Owner.
 3. Provide a minimum of 48 hours' notice to the Owner and receive written notice to proceed before interrupting any utility.
- E. Demolish and completely remove from the site any existing underground utilities designated to be removed, as shown on the Drawings or as specified.
- F. Repair any damaged utilities as acceptable to the Owner, Engineer, and utility company at no additional cost to the Owner.
- G. Contractor shall comply with maintenance and protection requirements as approved by the authority having jurisdiction.
- H. Protection of Persons and Property:
1. Barricade open excavations occurring as part of this work and post with warning lights, if required.
 2. Operate warning lights as recommended by authorities having jurisdiction.
 3. Protect structures, utilities, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
 4. Perform excavation within drip-line of trees to remain by hand, and protect the root system from damage or dry out to the greatest extent possible. Maintain moist conditions for root system and cover exposed roots with burlap. Paint cut roots of 1-inch diameter and larger with emulsified asphalt tree paint.

1.4 SUBMITTALS

- A. Samples:
1. The Contractor shall furnish representative earth materials to the testing laboratory for analysis and report, as directed by the Engineer, or as outlined in the specifications.
- B. Test Results:
1. The testing laboratory shall submit written reports of all tests, investigations,

findings, and recommendations to the Contractor and the Engineer.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Pipe Zone Bedding: Select mixture of graded crushed stone, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT Section 703-02 and meeting the following gradation requirements (NYSDOT Size 2):

SIEVE	PERCENT PASSING
1-1/2"	100
1"	90 – 100
1/2"	0 – 15

- B. Pipe Zone Backfill: Sound, durable sand, gravel, stone or blends of these materials, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT Section 304 and meeting the following gradation requirements (NYSDOT Subbase Type 4):

SIEVE	PERCENT PASSING
2"	100
1/4"	30 – 65
No. 40	5 – 40
No. 200	0 – 10

- C. Suitable Material: Sound, durable sand, gravel, stone or blends of these materials, free from organic, frozen or other deleterious materials, conforming to the requirements of NYSDOT 203-2.02C and meeting the following gradation requirements:

SIEVE	PERCENT PASSING
4"	100
No. 40	0 – 70
No. 200	0 – 15

1. Run-of-trench material, meeting the above criteria, shall be considered suitable material and shall be used for trench backfill only after tested in accordance with Section Quality Requirements and approved by the Engineer.

The Contractor shall pay for all additional testing required to determine the conformance of run-of-trench material, if at any time during the Work this material appears to be in non-conformance in the opinion of the Engineer.

PART 3 – EXECUTION

3.1 PRECONSTRUCTION MATERIAL QUALIFICATION TESTING

A. General:

1. Sufficient size samples shall be obtained from the potential borrow source to allow completion of tests listed in paragraph B below. Samples may be obtained from test borings, test pits, or from borrow pit faces provided that surficial dry or wet soil is removed to expose undisturbed earth. Tests listed below shall be performed on each sample obtained. A minimum of 3 representative samples from each potential borrow source shall be furnished to the testing laboratory for prequalification testing. Test data shall be provided to the Engineer a minimum of 2 weeks prior to construction for approval of borrow source. Three test reports completed within three months prior to construction may be submitted for commercial earth borrow sources or suppliers of stone products (crushed stone or graded stone products) in lieu of prequalification tests as approved by the Engineer.

B. Material Tests:

1. Particle Size Analysis:
 - a. Method: ASTM D422.
 - b. Number of Tests: One (1) per sample; three (3) per potential source.
 - c. Acceptance Criteria: Gradation within specified limits.
2. Maximum Density Determination:
 - a. Method: ASTM D1557 - Modified Proctor.
 - b. Number of Tests: One (1) per sample; three (3) per potential source.
3. Re-establish gradation and maximum density of fill material if source is changed during construction.

3.2 PREPARATION

- A. Establish required lines, levels, contours, and datum.
- B. Maintain benchmarks and other elevation control points; re-establish if disturbed or

destroyed at no additional cost to the Owner.

- C. Establish location and extent of existing utilities prior to commencement of excavation.

3.3 EXCAVATION

- A. All excavation shall be made to such depth as required and of the width shown on the Drawings to provide suitable room for building the structures and laying the pipe(s) they are to contain and for sheeting, shoring, pumping and draining as necessary, and for removing peat, silt, or any other materials which the Engineer may deem unsuitable. Hand trench excavation may be required to protect existing utilities and structures.
- B. Trench excavation for pipes shall be made by open cut to accommodate the pipe or structure at the depths indicated on the Drawings. Excavation shall be made to such a depth and to the width indicated on the Drawings so as to allow a minimum of 8 inches of pipe zone bedding to be placed beneath the bottom of all structures and barrels, bells or couplings of all pipes installed unless otherwise specified on the Drawings.
- C. The bottom of the trench shall be accurately graded to provide a uniform layer of bedding material as required for each section of pipe. Trim and shape trench bottoms and leave free of irregularities, lumps, and projections.
- D. Stockpile excavated subsoil for reuse where directed or approved.
- E. Over excavation/undercut: If, in the opinion of the Engineer, existing material below the trench grade is unsuitable for properly placing bedding material and laying pipe, the Contractor shall excavate and remove the unsuitable material and replace the same with an approved pipe zone bedding material properly compacted.
- F. Stability of Excavation: Slope sides of excavations shall comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavation in safe condition until completion of backfilling.
- G. Removal of materials beyond the indicated subgrade elevations, without authorization by the Engineer, shall be classified as unauthorized excavation and shall be performed at no additional cost to the Owner.

3.4 DEWATERING

- A. The Contractor shall remove all water from the excavation promptly and continuously throughout the progress of the work and shall keep the excavation dry at all times until the work is completed and excavation is backfilled or have sufficient weight to resist uplift pressures. Groundwater levels shall be depressed to a minimum of 2 feet below excavation subgrade. No pipe or structure is to be laid in water and water shall not be

allowed to rise on or flow over any pipe or structure until such time as approved by the Engineer.

- B. Provide a suitable point of discharge from dewatering operations shall be conveyed in a non-erosive manner satisfactory to the Engineer.
- C. Precautions shall be taken to protect uncompleted work from flooding during storms or from other causes. All pipe lines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected.

3.5 BEDDING AND BACKFILLING

- A. All pipe trenches backfill (pipe zone bedding, pipe zone backfill and trench backfill) shall be compacted by tamping or rolling to achieve a minimum dry density of 90 percent of the modified Proctor maximum dry density of the material used (ASTM D1557). Backfill in pipe trenches to be covered with pavement shall be compacted to a minimum of 95 percent of modified Proctor maximum dry density. Backfill materials shall be placed with water content within plus or minus 4 percent of optimum moisture content per the modified Proctor method (ASTM D1557). Any water used for compaction shall be provided by the Contractor at his own expense. The Contractor is responsible for the repair of any trench settlement at no expense to the owner.
- B. Bedding and backfilling shall be accomplished in three stages unless otherwise specified on the Contract Drawings. The first stage shall involve placement of pipe zone bedding as a layer(s) of selected material required to support, or to stabilize unsound or unsatisfactory foundation conditions. The second stage shall involve placement of pipe zone backfill from the top of the bedding material up to 1 foot above the pipe. The third stage involves the placement of trench backfill in the remainder of the trench up to the surface of the ground or the bottom of any special surface treatment subgrade elevation.
- C. The bedding material shall be placed in the trench after the trench has been excavated a minimum of 8 inches below the bell of the pipe to permit the placing of not less than 8 inches of bedding material unless otherwise specified on the Drawings. Where, in the opinion of the Engineer, more than 8 inches of bedding material shall be required, the excavation shall be performed and bedding placed to the depth ordered by the Engineer.
- D. Provide uniform bearing and support for each section of pipe at every point along the entire length except where necessary to excavate for bell holes, pipe joints, or other required connections. Dig bell holes and depressions for joints after trench bottom has been graded. Dig no deeper, longer, or wider than needed to make the joint connection properly.
- E. The bedding material shall be placed to the full width of trench. The bedding material shall be placed in loose lifts not exceeding 6 inches to the elevation shown on the Drawings or directed by the Engineer. The bedding material shall be tamped and

compacted to form a firm and even bearing surface.

- F. Pipe zone backfill shall be placed to the elevation shown on the Drawings in loose lifts not-to-exceed 6 inches in thickness, before compaction. The backfill shall be placed on both sides of the pipe at the same time and to approximately the same elevation. Any pipe that is damaged or moved out of alignment, regardless of cause, shall be replaced or realigned at the Contractor's expense. Each layer shall be thoroughly compacted by hand-tamping or mechanical means being careful not to damage the pipe. When the pipe zone backfill reaches 1 foot over the top of the pipe, the entire surface shall be compacted by mechanical means.
- G. The remainder, if any, of the trench above the pipe zone backfill shall be backfilled with suitable material in loose lifts not exceeding 6 inches in thickness before compaction. Each layer shall be thoroughly compacted by mechanical means.

3.6 BACKFILLING AROUND STRUCTURES

- A. The Contractor shall not place backfill against any structure without obtaining the approval of the Engineer. No dumping shall be allowed where materials would flow against or around such structures. Backfill material shall be deposited in horizontal layers not exceeding 6 inches in loose thickness or as shown on the Drawings and thoroughly compacted by hand or by mechanical means to the satisfaction of the Engineer.

3.7 SUSPENSION OF WORK

- A. Whenever the work is suspended, excavations shall be protected and the roadways, if any, left unobstructed. Within or adjacent to private property, material shall be stored at such locations as will not unduly interfere with traffic of any nature and in no case shall materials be stored in locations which will cause damage to existing improvements.

3.8 DISPOSAL OF MATERIAL

- A. Excess and unsuitable materials shall be disposed of by the Contractor on the site in an area approved by the Engineer or legally disposed of off- site at the Contractor's expense.

3.9 FIELD QUALITY CONTROL

- A. Notify the Engineer at least 3 working days in advance of all phases of filling and backfilling operations.
- B. In-place density testing shall be performed to ascertain the compacted density of the fill and backfill materials in accordance with the following methods:
 - 1. In-place relative density:

- a. Method: AASHTO T238, Nuclear Method.
- C. Perform initial density testing to verify that contractors proposed compaction effort will obtain the minimum required densities.
- D. In-place density tests on trench backfills shall be provided for every 500 cubic yards of fill and in vertical lifts not exceeding 2 feet and at least once daily.
- E. One particle size analysis (ASTM D422) and one modified Proctor compaction test (ASTM D1557) shall be completed for every 5,000 cubic yards of material placed.
- F. The Engineer may direct additional tests to establish gradation, maximum density, and in-place density as required by working conditions, at the Contractor's expense.
- G. Acceptance Criteria: The criteria for acceptability of in-place fill shall be in-situ dry density and moisture content. If a test fails to qualify, the fill shall be further compacted and re-tested. Subsequent test failures shall be followed by removal and replacement of the material.

++ END OF SECTION ++

SECTION 31 25 00

SOIL EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. Work included: Erosion control shall include all work, materials and measures necessary to control soil erosion and sediment control resulting from construction operations, prevent flow of sediment from the construction site, and contain construction materials (including excavation and backfill) within protected working areas. In general, the work under this section shall include, but not be limited to, the work shown on the Soil Erosion and Sediment Control Plans and Details.
- B. All Best Management Practices (BMPs) indicated in the Erosion and Sediment Control Plan (ESC) must be inspected and maintained regularly. Inspections are required either (1) at least once every 7 days or (2) at least once every 14 days and within 24 hours of the end of a rain event of 1/4-inch or more. The ESC plan must also be updated as site conditions and BMPs change. Keep records of maintenance activities and any ESC modifications for review during inspection.

1.2 QUALITY ASSURANCE

- A. The contractor shall comply with the requirements of the NYSDEC as they relate to erosion control.

1.3 SUBMITTALS

- A. Provide sample log, checklist, inspection report, or similar document that demonstrates periodic inspection of the implemented measures which must include sample dates, inspection frequency (at least monthly, year-round), & at least 3-inspections equally spaced over the site work period, description of any corrective action taken.
- B. Provide date-stamped photos which show the implemented measures and any corrective action that was taken.
- C. Describe what action was taken to effectively implement the ESC plan and maintain the erosion and sedimentation control measures.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Proper treatment and disposal of water from dewatering operations shall, at a minimum, require the use of a sedimentation/filtration system as necessary to remove suspended matter and other possible contaminants such as spilled fuel, lubricants, etc.
- B. The design and operation of settling basins and/or filters shall be sufficient to protect the environment in accordance with all pertinent NYSDEC regulations. It shall be the responsibility of the Contractor to maintain compliance at all times during dewatering operations. In addition, care shall be taken not to damage or kill vegetation by excessive water discharge or by silt accumulation in the discharge area.
- C. Settling basins, plastic filter fabrics, hay bales or other erosion and sediment control measures approved by the NYSDEC and as specified and shown on the Contract Plans shall be used where necessary to protect vegetation, wetlands and wetlands buffer zones and to prevent sediment from either surface runoff or the dewatering operations from entering catch basins, surface waters, etc.
- D. All soil erosion and sediment control practices are to be installed prior to any major soil disturbance and maintained until permanent protection is established.
- E. Traffic control standards require the installation of a 50-foot by 25-foot by 1-foot pad of 3-inch stone immediately after initial site disturbance. Said pad shall be underlain with a suitable synthetic filter fabric. The pad shall be maintained in a condition which will prevent tracking or flowing of sediment onto roadways and rights-of-way. This may require periodic top dressing with additional stone or additional length as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
- F. Upon completion of construction activities, the area used for the tracking pad shall be returned to elevations and conditions which existed prior to start of construction.
- G. The Contractor shall take necessary measures to maintain dust control. Dirt haul roads shall be sprinkled with water or given a surface of crushed stone or wood chips as required. Vehicles shall be cleaned, as necessary, prior to using public streets. Paved roads shall be sprinkled with water.
- H. All soil erosion and sediment control devices shall be located in the field as shown on the drawing or at the direction of the Engineer. The contract drawings

CONTRACT NO. 22-522
DIVISION 31 – EARTHWORK

are not intended to show the location and details for all such devices but are to be used as a reasonable guide.

- I. Any changes to the approved soil erosion and sediment control plans will require the submission of soil erosion and sediment control plans to the Engineer and the NYSDEC for re-approval. The revised plans must meet all current State soil erosion and sediment control practices. No extension of the Contract time will be given to the Contractor should resubmission be required.
- J. Contractor shall obtain all required permits.
- K. Upon completion of construction work and after final grading and when permanent stabilization has been established, the bales and silt fences shall be removed by the Contractor. However, no soil erosion devices shall be removed without written permission of the Engineer.
- L. All excess excavated material, except for topsoil, shall be removed from the site by the Contractor in accordance with the Contract Documents or as ordered by the Engineer.
- M. Conduit outlets and catch basin inlets must be protected prior to start of construction.
- N. The Contractor shall provide a detailed sequence of construction operations for review and submittal to the Engineer.
- O. The Contractor shall meet the Engineer on-site to define those areas which will require soil erosion and sediment control facilities, discuss their construction.
- P. All soil erosion and sediment control practices shall be left in place and maintained, including silt and sediment removal, until construction is completed, area is stabilized and the Engineer so directs.
- Q. All dewatering operations must discharge directly into a sediment trap. Sediment filters shall be installed in accordance with the drawings and the details of design and construction shall be prepared and submitted by the Contractor to the Engineer and Owner for review.
- R. The Contractor shall restrict his operations to the areas of construction as shown on the Contract Drawings. Any encroachment outside the areas of construction shall be the Contractor's responsibility and he shall assume all costs for repairing any damage caused by his operations.

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 31 25 13

EROSION CONTROL MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

- A. Work Included: Under this section, the Contractor shall provide all labor, equipment and material necessary to furnish and install erosion control materials as shown on the plans, as specified and as directed by the Engineer.
- B. General:
 - 1. Erosion control materials shall be installed on sideslopes to provide soil erosion resistance, as shown on the Plans and/or as directed by the Engineer.
 - 2. Erosion control materials shall be installed in seeded drainage channels, swales and sideslopes to provide permanent soil erosion resistance and vegetation reinforcement, as shown on the Plans and/or as directed by the Engineer.
- C. Related Work Specified Elsewhere:
 - 1. Section 31 25 00, Soil Erosion and Sediment Control.
 - 2. Section 31 00 00, Earthwork .

1.2 QUALITY ASSURANCE

- A. The manufacturer of the erosion control materials shall be a specialist in the production of the specified materials and the proposed materials shall be a standard product of their manufacture.

1.3 SUBMITTALS

- A. Submit shop drawings in accordance with the General Contract Conditions.
- B. Submittal shall include, but not be limited to, manufacturer's data, specifications, samples, installation instructions and a list of previous installations identifying the name of the owner, the project, Engineer (with telephone number and contact name), quantity of material furnished and its intended purpose.

- C. The Contractor shall furnish a notarized affidavit signed by an authorized representative of the manufacturer certifying that the proposed materials comply with the requirements specified herein and are suitable for the intended purpose.
- D. No material shall be shipped to the Project site until the affidavit is submitted to and approved by the Engineer.

PART 2 - PRODUCTS

2.1 PERMANENT EROSION CONTROL FABRIC

- A. The composite turf reinforcement mat (C-TRM) shall be a machine produced mat of 100% UV stabilized polypropylene fiber matrix incorporated into a permanent 3-dimensional netting structure.
- B. The matrix shall be evenly distributed across the entire width of the matting and stitch bonded between three super heavy-duty UV stabilized nettings with 0.50 x 0.50-inch (1.27 x 1.27 cm) openings. The middle, dramatically corrugated (crimped) netting shall form prominent closely spaced ridges across the entire width of the mat. The three nettings shall be stitched together on 1.50-inch (3.81 cm) centers with UV stabilized polypropylene thread to form a permanent 3-dimensional structure.

All mats shall be manufactured with a colored thread stitched along both outer edges (approximately 2 to 5 inches [5 to 12.5 cm] from the edge) as an overlap guide for adjacent mats.

- C. The composite turf reinforcement mat shall be the North American Green P550, or equivalent. The P550 permanent composite turf reinforcement mat shall have the following physical properties:

Material Content

Matrix 100% UV Stabilized Polypropylene Fibers (0.50 lbs/yd²) (0.27 kg/m²)

Netting Top and bottom - Ultra Heavy UV Stabilized Polypropylene - (24 lb/1,000 ft² [11.7 kg/100m²] approximate weight)

Mid - Ultra Heavy UV Stabilized Corrugated (24 lb/1,000 ft² [11.7 kg/100m²] approximate weight)

Thread Black UV Stabilized Polypropylene

Physical Specifications (per roll)

	English	Metric
Width	6.50 ft	2.00 m
Length	55.50 ft	16.90 m
Weight	52 lbs ± 10%	23.59 kg
Area	40 yd ²	33.40 m ²
Stitch Spacing	1.50 in	3.81 cm

- D. Erosion control fabric shall be secured in place using heavy duty metal staples. The metal staples shall be U-shaped, a minimum of 12 inches long (each leg) and shall be fabricated from 9 gauge or greater diameter metal wire. The metal staples shall be furnished by the manufacturer of the erosion control fabric and shall be suitable for the installed product and consistent with the manufacturer's recommendations.

2.2 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Each roll of erosion control material delivered to the site shall be labeled by the manufacturer identifying the manufacturer's name, product identification, roll dimension and direction for unrolling. Each roll of erosion control material shall be supplied wrapped in a relatively watertight and opaque protective cover.
- B. All erosion control material shall be properly stored to protect the materials from ultraviolet degradation, precipitation or other inundation, mud, dirt, dust, puncture, cutting, extreme heat caused by direct sunlight or any other damaging or deleterious conditions.
- C. Materials which are damaged during shipment, storage, handling or installation shall be rejected, removed from the job site and replaced at no additional cost to the Owner. The Contractor shall take special care to ensure that the integrity of the protective wrapping on each roll is maintained until the time of installation.

PART 3 - EXECUTION

3.1 GENERAL

- A. The erosion control materials shall be installed over the prepared seedbed which has been constructed in accordance with the requirements of these specifications.
- B. Prior to the placement of the erosion control materials in an area, the Contractor and the Engineer shall examine the prepared seedbed to ensure that it is smooth, stable, firm, evenly graded, free of protrusions, sharp stones, vehicle imprints or other damaging objects, properly and evenly seeded and free of erosion. The Contractor shall immediately repair any damage or defect in the prepared seedbed, including reseeded if necessary, prior to the installation of the erosion control materials.

- C. The Contractor shall handle and install the erosion control materials in such a manner to ensure that the material is not damaged in any way.
- D. The protective wrapping on each roll shall not be removed sooner than one hour prior to unrolling. Unused portions of rolls, which are not used in the same day that they are unwrapped, shall be rewrapped and properly stored. Unused portions of rolls which are shorter than 33% of the manufactured roll length shall be discarded unless specifically approved by the Engineer for a particular application.
- E. In the presence of wind, the erosion control material shall be weighted with sandbags or the equivalent. Such sandbags shall be installed during placement and shall remain in place until the installation of the erosion control material is completed. The sandbags shall not be left in place, incorporated into the work, or their contents deposited on the work.
- F. The erosion control materials shall be cut using approved cutting instruments as recommended by the manufacturer. The method of cutting shall result in a neat, clean, controlled cut which does not cause pulling or unraveling of the material components.
- G. The erosion control materials shall be installed on the prepared seedbed within 36 hours of the placement of the seed and landscaping materials.
- H. Apply erosion control materials with the length of roll laid parallel to the flow of the water in swales and channels or along the direction of slope for crown and sideslope areas.
- I. Sideslope Installation:
 - 1. The erosion control fabric shall be installed on the sideslope areas in accordance with the manufacturer's recommendations as specified and as directed by the Engineer.
 - 2. The erosion control fabric shall be installed vertically downslope in the direction of water flow.
 - 3. Anchor fabrics at top of slope in a 6-inch by 6-inch anchor trench, staple fabric in anchor trench on 3 feet centers. Backfill, compact and hand reseed trench areas.
 - 4. Overlap fabric edges at least 3 inches and secure with staple at least 3 feet on centers.
 - 5. Do not pull the erosion control fabric taut during installation. The erosion control fabric must be in intimate contact with the underlying soil surface. If

CONTRACT NO. 22-522
DIVISION 31 – EARTHWORK

trampolining is experienced, install additional staples to secure the fabric to the soil.

6. Staple the erosion control fabric to the underlying soil using a uniform stapling pattern which will provide a staple (field) density of at least two staples per square yard.
 7. Install check slots every 50 feet by placing a fold at least 8 inches vertically into the soil. Staple the fabric in the check slot on 3 feet centers and at each edge. Backfill, compact and hand seed the check slots.
 8. Overlap successive lengths of erosion control fabric at least 1-foot shingle style, with upslope layer on top. Staple overlapped area on 1-foot centers.
 9. Anchor the downslope ends of the fabric in an anchor slot at least 8 inches deep. Secure the fabric in the anchor slot with staples 3 feet on center and at each edge. Backfill, compact and hand seed the anchor slot.
- J. The Contractor shall exercise extreme care during the placement and installation of the erosion control materials so as to minimize the disturbance to the prepared seedbed. The Contractor shall repair any damage to the prepared seedbed to the satisfaction of the Engineer.

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 31 40 00

SHORING AND UNDERPINNING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall provide all labor, materials, equipment, and Design of bracing, shoring, and underpinning. Selection of construction sequence. Temporary bracing of the structure or portions of the structure as required to prevent the structure from becoming unsafe during construction. Temporary shoring of portions of the structure as required to prevent the structure from becoming unsafe during construction. Temporary shoring of excavations. Construction and removal of posts, timbers, lagging, braces, etc. required in connection with bracing, shoring, and underpinning the structure during construction. Excavation, concrete placement and backfilling required in connection with underpinning
2. The Contractor shall accept the site in the condition in which it exists at the time of the award of the Contract.

1.2 REFERENCES

A. Standards referenced in this Section are General:

The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.

- B. State of New York – New York State Department of Transportation (NYSDOT): Standard Specifications.

1.3 QUALITY ASSURANCE

- A. Design calculations and Shop Drawings of proposed bracing, shoring, and underpinning of the structure shall be prepared, stamped, and signed by a Structural Engineer registered in the State of New York.

1.4 SUBMITTALS

- A. The Contractor shall submit Shop Drawings indicating layout, member sizes, connection details and construction sequence for bracing, shoring and underpinning. No work related to bracing, shoring or underpinning shall take place until the Engineer has reviewed the Shop Drawings.
- B. The Contractor shall also submit Design calculations of bracing, shoring and underpinning showing member stresses and connections due to imposed loads.

PART 1 - PRODUCTS

2.1 MATERIALS

- A. MATERIALS FOR SHORING AND BRACING
 - 1. Materials for shoring and bracing shall be undamaged, high quality materials.
- B. CONCRETE FOR UNDERPINNING
 - 1. Concrete for underpinning shall meet the requirements of Division 03 Section "Cast-in-Place Concrete".

PART 3 -EXECUTION

3.1 CONSTRUCTION

- A. Construction of bracing, shoring and underpinning shall be in accordance with the reviewed Shop Drawings prepared by the Subcontractor's Engineer.
- B. The Contractor shall hire the Engineer responsible for the design of bracing, shoring and underpinning and inspection of the work as detailed on the bracing, shoring, and underpinning Shop Drawings, prior to sawcutting or removing portions of the structure.
- C. Excavations for underpinning the foundations shall be inspected by the Geotechnical Engineer prior to placement of concrete.
- D. Remove surplus excavated materials from site.

3.2 REMOVAL OF BRACING AND SHORING

- A. Bracing and shoring shall not be removed until the new members have acquired

CONTRACT NO. 22-522
DIVISION 31 – EARTHWORK

sufficient strength to support their weight and the loads superimposed thereon safely. In no case may bracing or shoring be removed until the time and sequence has been approved by the Engineer responsible for bracing and shoring and reviewed by the University.

- B. In general, bracing and shoring of concrete shall remain in place for at least ten days, when they may be removed provided the concrete is sufficiently hard and will not be injured.

+ + END OF SECTION + +

NO TEXT ON THIS PAGE

SECTION 32 12 16

ASPHALT PAVEMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. Contractor shall furnish all labor, materials, equipment and incidentals required to provide hot mix-hot laid bituminous paving as shown and specified. In addition, any existing pavement damaged by the Contractor outside the removal limits shown on the Drawings shall be removed and replaced, as directed by the Engineer at no additional cost to the Owner.
2. The Contractor shall furnish all labor, materials and equipment necessary for saw cutting, installing and removing and disposing of temporary pavement, preparing the subgrade; and constructing a bituminous pavement. The Work includes pavements comprised of one or more of the following:
 - a. Base course.
 - b. Tack coats.
 - c. Top course.
3. In order to prevent damage to the permanent pavement by the Contractor's operations, all permanent pavement materials, including the aggregate base course, shall not be installed until approved in writing by the Engineer. The finished course of paving shall not be installed until all buildings, structures, equipment, piping and outside facilities are substantially completed and at a time approved by the Engineer.

B. Related Work Specified Elsewhere:

1. Section 02 40 00, Demolition, Removals and Modifications.
2. Section 31 00 00, Earthwork.

1.2 QUALITY ASSURANCE

- A. Plant Inspection: All bituminous mixes will be subject to inspection, testing and approval by the Owner. The Contractor and suppliers shall furnish all necessary assistance and cooperation.

- B. Laboratory approval of the sources of supply of the fine aggregates, coarse aggregates, mineral filler, bituminous materials, liquefiers and any other materials used in the mix shall be submitted by the Contractor for approval. No delivery or mixed materials shall be made from any bituminous mixing plant until such approval is obtained.
- C. Testing Services:
1. General: Testing of materials and of compaction requirements for compliance with technical requirements of the Specifications shall be the duty of the testing laboratory provided by the Contractor.
 2. Testing Services: The testing laboratory will:
 - a. Test the Contractor's proposed materials in the laboratory and field for compliance with the Specifications.
 - b. Perform field density tests to assure that the specified compaction of surface and base course materials has been obtained.
 - c. Report all test results to the Engineer, and the Contractor.
 3. Authority and Duties of Testing Laboratory: Technicians representing the testing laboratory will inspect the materials in the field and perform compaction tests, and will report their findings to the Engineer and the Contractor. When the materials furnished or work performed by the Contractor fails to fulfill Specifications requirements, the technician will direct the attention of the Engineer and the Contractor to such failure.
 - a. The technician will not act as foreman or perform other duties for the Contractor. Work will be checked as it progresses, but failure to detect any defective work or materials shall not in any way prevent later rejection when such defect is discovered, nor will it obligate the Engineer for final acceptance. Technicians are not authorized to revoke, alter, relax, enlarge, or release any requirements of the Specifications, nor to approve or accept any portion of the Work.
 4. Responsibilities and Duties of Contractor: The use of testing services shall in no way relieve the Contractor of his responsibility to furnish materials and construction in full compliance with the Drawings and Specifications. To facilitate testing services, the Contractor shall:
 - a. Secure and deliver to the Engineer and the testing laboratory representative samples of the materials he proposes to use and which are required to be tested.

- b. Furnish such casual labor as is necessary to obtain and handle samples at the project or at other sources of material.
 - c. Advise the testing laboratory and Engineer sufficiently in advance of operations to allow for completion of quality tests and for the assignment of personnel.
- D. Reference Standards: Comply with the applicable provisions unless otherwise shown or specified.

1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval job mix formula proposed, giving complete data on materials, including source, location, percentages, temperatures, date of last testing, and all other pertinent data.
- B. Submittals: Furnish certificate for approval, stating bedding course of well graded sand conforms to ASTM C33.

Furnish certificate for approval, stating the base course of crushed stone conforms to ASTM 2940, or approved equal.

1.4 JOB CONDITIONS

- A. Weather Limitations:
 - 1. Permanent paving materials, including the aggregate base course, shall be placed only when the air temperature is 40 degrees Fahrenheit and rising or warmer and the surface on which the paving is to be laid is 40 degrees Fahrenheit or higher. All temperatures are to be measured in the shade.
 - 2. Bituminous pavement for temporary access roads, staging area and other temporary uses, that are not and will not become part of a permanent pavement, will not be subject to the above regulations in regard to weather limitations. No pavement, however, shall be laid on a frozen subgrade.
- B. Grade Control: Establish and maintain the required lines and grades, including crown and cross-slope for each course during construction operations.

PART 2 - PRODUCTS

2.1 PAVEMENT THICKNESS

- A. In-place compacted material thickness shall not be less than shown on the Contract Drawings. Temporary pavement shall be 4-inch minimum thickness.

2.2 MATERIALS

- A. Materials shall conform to the following:
1. Subgrade shall be virgin material or select fill conforming to the requirements of Section 31 00 00, Earthwork.
 2. Base Courses:
 - a. As indicated on contract drawings.
 3. Pavement:
 - a. Provide a wearing surface for permanent pavement, consisting of a top course. Top course shall be as indicated on Contract Drawings..
 4. Tack Coat: Tack coat shall be an asphalt emulsion conforming to County Standard Material Specification M5 Bituminous Materials, Material Designation RS-1.

PART 3 - EXECUTION

3.1 GENERAL

- A. The installation of all pavement materials shall be performed by experienced personnel.
- B. Preparing the mixtures, paving equipment, placing the mixes, and compacting the mixes shall be in accordance with the Specifications.
1. Preparing the mixtures include the plant equipment, stockpiling, heating, aggregate processing, mixing of aggregate and bituminous material, and transportation to job site.
 2. Paving equipment includes bituminous pavers, rolling equipment and hand tools.
 3. Placing the mixes includes paver placing, hand placing, spreading, tamping and jointing.
 4. Compacting the mixes includes breakdown rolling, second rolling and finish rolling.

CONTRACT NO. 22-522
DIVISION 32 – EXTERIOR IMPROVEMENTS

- C. Regardless of the type of pavement restoration involved, the Contractor shall insure that all castings are set flush with the final surface. The Contractor is advised that there shall be no placement of bituminous concrete top course until:
 - 1. All curbs, gutter aprons, driveway aprons, surface inlets, catch basins, and manholes have been constructed to their final elevation.
 - 2. All defective areas of the binder course have been repaired.
- D. Provide final surfaces of uniform texture, conforming to required grades and cross sections.
- E. Repair holes from test specimens as specified for patching defective work.

3.2 SUBGRADE PREPARATION

- A. Permanent Pavement: Preparation of the permanent pavement subgrade including compaction shall be completed for the full width of the area to be paved. All existing pavement edges shall be saw cut prior to installation of new pavement.
 - 1. Fine grade earth subgrade and compact with self-powered rollers of sufficient size to provide a firm, unyielding surface to receive the aggregate base course. Remove and replace all unsuitable subgrade material as directed by the Engineer.
 - 2. Where the subgrade is constructed by excavation of the existing grade, the top 6 inches of the subgrade shall be compacted to at least 95 percent of maximum density at optimum moisture content as determined in ASTM D 698.
 - 3. When the subgrade is constructed on fill:
 - a. The existing grade shall be made smooth and compacted per section 3.2.A.2.
 - b. The subgrade shall be brought to the appropriate lines and grades utilizing select backfill and placed in accordance with the applicable requirements of Section 31 00 00, Earthwork.
 - 4. Existing grades prior to placement of subbase or backfill shall be established such that when materials for construction are placed no rutting or displacement will occur.
- B. No materials shall be placed on subgrades which are muddy or have water thereon.

3.3 PERMANENT PAVEMENT BASE COURSE INSTALLATION

- A. Construct base course to thickness as shown on Drawings in equal layers. Installation shall be in conformance with County Standard Specification.

3.4 LIMESTONE SCREENINGS INSTALLATION

- A. Construct limestone screenings course in the staging areas to thickness shown on the Drawings or as directed by engineer (min. 2 inches).
- B. The screenings shall be spread evenly and thoroughly rolled with an approved three-wheel roller, weighing not less than 10 tons, until thorough consolidation is obtained. All depressions shall be filled with screenings, and the process of rolling and filling shall continue until a thoroughly compacted uniform surface, satisfactory to the Engineer, is produced. No segregation of large or fine materials will be permitted, but the screenings shall be sprinkled with water at times and in the amounts necessary to provide consolidation.

3.5 PAVEMENT INSTALLATION

- A. The contact surfaces of all curbs, gutters, castings and adjacent pavement edges shall be painted with a layer of tack coat before placing or repairing the pavement course.
- B. Bituminous concrete shall be constructed to thicknesses as shown on the Drawings and rolled with 12-ton self-powered two-axle or three-axle tandem or three-wheel roller to a density of 94 percent of maximum.
- C. Pavement shall be uniform in appearance, free of bumps and hollows, worked to drain, and free of bleeding.
- D. Trim the existing pavement by saw cutting of all loose edges and broom and tack coat all edges prior to placing the transition pavement.
- E. In placing and compacting abutting courses of bituminous concrete pavements, joint heating devices shall be used on all joints (transverse, longitudinal and existing).
- F. Bituminous pavement shall butt with the existing pavement in a smooth, even transition including a top sealing of the pavement joint with a bead of asphalt concrete.
- G. Test bituminous pavement for conformity with the specified crown and grade immediately after initial compression. Correct variations by the removal or additional of materials and by continuous rolling.
- H. The finished surface shall not vary more than 1/4 inch when tested with a 16-foot straightedge applied parallel with, or at right angles to, the centerline.

CONTRACT NO. 22-522
DIVISION 32 – EXTERIOR IMPROVEMENTS

- I. After final rolling, again test the smoothness of the course. Correct humps or depressions exceeding the specified tolerances or that retain water on the surface by removing the defective work and replacing with new material.

3.6 PATCHING

- A. As directed by the Engineer, remove and replace all defective areas in temporary and permanent pavements. Cut-out such areas and fill with fresh bituminous concrete top course as specified in the County Standard Specification. Compact to the required density.

3.7 CLEANING AND PROTECTION

- A. After completion of paving operations, clean surfaces of excess or spilled bituminous materials and all foreign matter.
- B. Protect newly finished pavement until it has become properly hardened by cooling.
- C. During the paving operation cover openings of drainage structures in the area of paving.

3.8 MAINTENANCE AND ACCEPTANCE

- A. The Contractor shall maintain all paved surfaces until the roads and parking areas have been accepted. The paved areas will not be accepted until after the Contractor has completed all phases of the work, including all necessary transportation, hauling and severe usage of the paved areas. The Engineer shall be the sole judge in this matter. The warranty period shall be as noted in the Agreement.

++ END OF SECTION ++

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SECTION 32 31 13
CHAIN LINK FENCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. DIVISION 01 - GENERAL REQUIREMENTS: Drawings, quality, product and performance requirements, general and supplemental conditions apply as applicable to the project and project documents.

1.2 SUMMARY

- A. This Section includes commercial chain link fence and gates specifications:

1. Galvanized steel coated chain link fabric
2. Polymer coated steel chain link fabric
3. Zinc 5% Aluminum alloy coated steel chain link fabric
4. Galvanized steel framework and fittings
5. Polymer coated galvanized steel framework and fittings
6. Gates: swing
7. Installation

- B. Related Sections:

1. 01 33 00 Submittal Procedures
2. 01 45 00 Quality Control
3. 01 60 00 Product Requirements
4. 03 30 00 Cast in Place Concrete

1.3 REFERENCES

- A. ASTM A392 Specification for Zinc-Coated Steel Chain-Link Fence Fabric
- B. ASTM A817 Specification for Metallic-Coated Steel Wire for Chain Link Fence Fabric and Marcellled Tension Wire

CONTRACT NO. 22-522
DIVISION 32 – EXTERIOR IMPROVEMENTS

- C. ASTM A824 Specification for Metallic-Coated Steel Marcellled Tension Wire for Use With Chain Link
- D. ASTM F552 Standard Terminology Relating to Chain Link Fencing
- E. ASTM F567 Standard Practice for Installation of Chain Link Fence
- F. ASTM F626 Specification for Fence Fittings
- G. ASTM F668 Specification for Polymer Coated Chain Link Fence Fabric
- H. ASTM F900 Specification for Industrial and Commercial Swing Gates
- I. ASTM F934 Specification for Standard Colors for Polymer-Coated Chain Link
- J. ASTM F1043 Specification for Strength and Protective Coatings of Steel Industrial Chain Link Fence Framework
- K. ASTM F1083 Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
- L. ASTM F1184 Specification for Industrial and Commercial Horizontal Slide Gates
- M. Comply with ASTM A 53 for requirements of Schedule 40 piping.

1.4 DEFINITIONS

- A. Height of Fence: Distance from the top of concrete footing to the top of fabric.

1.5 SUBMITTALS

- A. Shop Drawings: Complete detailed drawings for fence and gate.
- B. Product Data: Manufacturer's catalog cuts, specifications, and installation instructions for each item specified.
- C. Samples:
 - 1. Fence Fabric: Minimum one sq ft.
 - 2. Fence and Gate Posts: Two each, one ft long, if requested.
 - 3. Miscellaneous materials and accessories: As requested.

1.6 QUALITY ASSURANCE

- A. Comply with standards of the Chain Link Fence Manufacturer’s Institute.
- B. Provide steel fence and related gates as a complete system produced by a single manufacturer, including necessary erection accessories, fittings, and fastenings.
- C. Posts and rails shall be continuous without splices.
- D. Concrete batching plants shall be currently approved as concrete suppliers by the New York State Department of Transportation.

PART 2 - PRODUCTS

2.1. MANUFACTURERS

- A. Framework, posts, rails, pipe for gate frames:
 - 1. Wheatland Tube Co. 800 343 0124 e-mail: fence@wheatland.com
www.wheatland.com
 - 2. Or approved Equal.

2.2 MATERIALS

- A. Class B Steel Tubing (Option):
 - 1. SS-40 Fence Pipe by Allied Tube and Conduit Corp., Harvey, IL.
 - 2. Tuf-40 Fence Framework by American Tube Corp., Phoenix, AZ.

2.3 STEEL FRAMEWORK (FOR FENCES 6’-1” - 10’-0” HIGH)

- A. End Posts and Corner Posts:
 - 1. Pipe: 2.875 inches OD, 5.79 lb per lin ft (Schedule 40).
 - 2. Square Tubing: 2.50 inches OD, 5.70 lb per lin ft.
 - 3. Class B Steel Tubing: 2.875 inches OD, 4.64 lb per lin ft.
 - 4. Roll Formed C-Section: 3.5 inches x 3.5 inches x 0.128 inches thick, with minimum bending strength of 486 lb under a 6 foot cantilever load.
- B. Line Posts:
 - 1. Pipe: 2.375 inches OD, 3.65 lb per lin ft (Schedule 40).

CONTRACT NO. 22-522
DIVISION 32 – EXTERIOR IMPROVEMENTS

2. Class B Steel Tubing: 2.375 inches OD, 3.11 lb per lin ft.
3. H-section: 2.25 inches x 1.95 inches x 0.143 inches, 4.10 lb per lin ft.
4. Roll Formed C-Section: 2.25 inches x 1.70 inches x 0.121 inches thick, with minimum bending strength of 316 lb under a 6 foot cantilever load.

2.4 STEEL FABRIC

- A. One-piece widths for fence heights up to 12'-0".
- B. Zinc-Coated Steel Fabric: ASTM A392 hot dipped galvanized before or after weaving.
- C. Chain link, No. 9 gage, 2 inch mesh.
- D. Salvages: Top side twisted and barbed; bottom side knuckled.\

2.5 SWING GATE POSTS

- A. Single width of gate up to 6'-0" wide and less than 10'-0" high.
 1. Pipe: 2.875 inches OD, 5.79 lb per lin ft (Schedule 40).
 2. Square Tubing: 2.50 inches OD, 5.70 lb per lin ft.
 3. Class B Steel Tubing: 2.875 inches OD, 4.64 lb per lin ft.
 4. Roll Formed C-Section: 3.5 inches x 3.5 inches x 0.128 inches thick, with minimum bending strength of 486 lb under a 6 foot cantilever load.

2.6 SWING GATE FRAMES

- A. Height: 6'-0" - 12'-0", or leaf width exceeding 8'-0":
 1. Pipe: 1.90 inches OD, 2.72 lb per lin ft (Schedule 40).
 2. Square Tubing: 2 inches OD, 2.60 lb per lin ft.
 3. Class B Steel Tubing: 1.90 inches OD, 2.28 lb per lin ft.
- B. Assemble gate frames by welding or with special steel fittings and rivets for rigid connections. Install mid-height horizontal rail on gates over 10 feet high. When width of gate leaf exceeds 10 feet, install mid-distance vertical bracing of the same size and weight as frame members. When either horizontal or vertical bracing is not required, provide truss rods as cross bracing to prevent sag or twist.

2.7 GATE HARDWARE

- A. Hinges: Pressed Steel Offset 180 degree gate hinge item no. 014005 or appropriate for use by Hearne Steel Company, Inc.
- B. Latch: Forked type for single gates 10 feet wide or less. Plunger bar type, complete with flush plate set in concrete for double gates and single gates over 10 feet. Padlock eye shall be an integral part of latch construction.

2.8 MISCELLANEOUS MATERIALS AND ACCESSORIES

- A. Rails and Post Braces:
 - 1. Pipe: 1.660 inches OD, 2.27 lb per lin ft (Schedule 40).
 - 2. Class B Steel Tubing: 1.660 inches OD, 1.84 lb per lin ft.
 - 3. Roll formed C-Section: 1.625 inches x 1.25 inches x 0.0747 inches thick with minimum bending strength of 192 lb on a 10 foot span.
- B. Fittings and Post Tops: Steel, wrought iron, or malleable iron.
 - 1. Fasteners: One-way cadmium plated steel screws.
- C. Stretcher Bars: One piece equal to full height of fabric, minimum cross-section 3/16 inch x 3/4 inch.
- D. Metal Bands (for securing stretcher bars): Steel, wrought iron, or malleable iron.
- E. Wire Ties:
 - 1. For tying fabric to line posts, rails and braces: 9 gage steel wire.
 - 2. For tying fabric to tension wire: 11 gage steel hog rings.
- F. Truss Rods: 3/8 inch diameter.
- G. Concrete: Portland Cement concrete having a minimum compressive strength of 4000 psi at 28 days.
- H. Spiral Paper Tubes:
 - 1. Sonotube by Sonoco Products Company.
 - 2. Slek/tubes by Jefferson Smurfit Corporation.
- I. Tension Wire: 7 gage coiled spring steel wire.

- J. Shrink-Resistant Grout (Ferrous): Factory-packaged, non-catalyzed, ferrous aggregate mortar grouting compound selected from the following:
 - 1. Embeco 636 by Master Builders.
 - 2. Ferrolith G-NC by Sonneborn.
 - 3. Ferro-Grout by L&M Construction Chemicals.
 - 4. Vibra-Foil by A.C. Horn.

- K. Privacy slats
 - 1. Vinyl Fence fabric slats:
 - a. Manufacturer: The Reinforced Vinyl Fence fabric with pre-inserted slats as manufactured by PrivacyLink®, LLC P.O. Box 295, Hyde Park, Utah 84318. The manufacturer may be contacted at 800-574-1076, 435-563-1058 or via fax at 435-563-1062.
 - b. Fabric Diameter & Finish. 3-1/2” x 5” mesh by 9 ga. (0.148”) galvanized before weaving per ASTM A392 & A817, 1.2 oz Type II Class 4.
 - c. Fabric Color: gray or approved equal.

2.9 FINISHES

- A. Steel Framework:
 - 1. Pipe: Galvanized in accordance with ASTM A 53, minimum 2.0 oz zinc per sq ft.
 - 2. Square Tubing: Galvanized in accordance with ASTM A 123, 2.0 oz zinc per sq ft.
 - 3. Class “B” Steel Tubing: Exterior; 1.0 oz zinc per sq ft plus chromate conversion coating and clear polyurethane. Interior; zinc rich organic coating.
 - 4. H-Section: Galvanized in accordance with ASTM A 123, 1.6 oz zinc per sq ft.
 - 5. Roll Formed C-Section: Galvanized in accordance with ASTM A 123, 2.0 oz zinc per sq ft.

CONTRACT NO. 22-522
DIVISION 32 – EXTERIOR IMPROVEMENTS

- B. Fabric; one of the following:
 - 1. Galvanized Finish: ASTM A 392 class II zinc coated after weaving, with 2.0 oz per sq ft.
- C. Fence and Gate Hardware, Miscellaneous Materials, Accessories:
 - 1. Wire Ties: Galvanized Finish, ASTM A 90, 1.6 oz zinc per sq ft, or aluminized finish, ASTM A 809, 0.40 oz per sq ft.
 - 2. Hardware and Other Miscellaneous Items: Galvanized Finish, ASTM A 153 (Table 1).
- D. Tension Wire; one of the following:
 - 1. Galvanized Finish: ASTM A 121 class 3, 0.80 oz per sq ft.
 - 2. Aluminized Finish: ASTM A 585 class 2, 0.30 oz per sq ft.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clear and grub along fence line as required to eliminate growth interfering with alignment. Remove debris from State property.
- B. Do not begin installation of fence in areas to be cut until finish grading has been completed.

3.2 INSTALLATION

- A. Space posts equidistant in the fence line with a maximum of 10 feet on center.
- B. Setting Posts in Earth: Drill holes for post footings. Unless otherwise indicated, drill holes 3'-6" deep, 10 inches in diameter for line posts, 12 inches in diameter for all other posts. If existing grade at the time of installation is below finished grade, provide spiral paper tubes to contain concrete to finish grade elevation. Set posts in center of hole and fill hole with concrete. Plumb and align posts. Vibrate or tamp concrete for consolidation. Finish concrete in a dome shape above finish grade elevation to shed water. Do not attach fabric to posts until concrete has cured a minimum of 7 days.
- C. Setting Posts in Rock: Drill holes into solid rock one inch wider than post diameter, 18 inches deep for end, pull, corner, and gate posts, and 12 inches deep for line posts. Set posts into holes and fill annular space with shrink-resistant grout.

- D. Install top rail continuously through post tops. Install expansion couplings as recommended by fencing manufacturers.
- E. Install bottom and intermediate rails in one piece between posts and flush with post on fabric side using special offset fittings where necessary.
- F. Diagonally brace corner posts to adjacent line posts with truss rods and turnbuckles.
- G. Attach fabric to security side of fence. Maintain a 2 inch clearance above finished grade except when indicated otherwise. Thread stretcher bars through fabric using one bar for each end and gate post and 2 for each corner and pull post. Pull fabric tight so that the maximum deflection of fabric is 2 inches when a 30 pound pull is exerted perpendicular to the center of a panel. Maintain tension by securing stretcher bars to posts with metal bands spaced 15 inches oc. Fasten fabric to steel framework with wire ties spaced 12 inches oc for line posts and 24 inches oc for rails and braces. Bend back wire ends to prevent injury. Tighten stretcher bar bands, wire ties, and other fasteners securely.
- H. Position bolts for securing metal bands and hardware so nuts are located opposite the fabric side of fence. Tighten nuts and cut off excess threads so no more than 1/8 inch is exposed. Peen ends to prevent loosening or removal of nuts.
 - 1. Secure post tops with one-way screws.
- I. Install gates plumb and level and adjust for full opening without interference. Install ground-set items in concrete for anchorage, as recommended by fence manufacturer. Adjust hardware for smooth operation and lubricate where necessary.
- J. Tension Wire: Support bottom edge of fabric with tension wire. Weave tension wire through fabric or fasten with hog rings spaced 24 inches oc. Tie tension wire to posts with 9 gage wire ties.

++ END OF SECTION ++

SECTION 32 92 00

GRASS RESTORATION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope: The General Construction Contractor shall furnish all labor, materials and equipment necessary to restore grass areas disturbed by the construction. The limits of restoration will be determined by the Engineer. Disturbance of grass areas shall be kept to a minimum during construction.
- B. In the event that seeding restoration fails or is not feasible due to season, the Contractor shall be required to restore the grass areas with sod.
- C. Related Work Specified Elsewhere:
 - 1. Section 31 00 00, Earthwork

1.2 SUBMITTALS

- A. General: Submit shop drawings in accordance with Section 013300 of the Contract Specifications.
- B. The Contractor shall submit certificates of materials compliance before delivery of material for the following items:
 - 1. Topsoil
 - 2. Seed
 - 3. Fertilizer (10-6-4)
 - 4. Limestone
 - 5. Mulch

PART 2 - PRODUCTS

2.1 TOPSOIL

- A. The topsoil shall consist of a fertile, friable, natural top soil of loamy character, without admixtures of subsoil, uniform in quality and shall be free from refuse of any nature, hard clods, stiff clay, sods, hard pan, pebbles larger than 3/4 inch in diameter, coarse sand, noxious weeds, sticks, brush, or other rubbish.

CONTRACT NO. 22-522
DIVISION 32 – EXTERIOR IMPROVEMENTS

- B. The topsoil shall be taken from a well drained, arable site, preferably one which has been under cultivation at least 5 years previous to the time of removal.
- C. The topsoil shall contain not less than 5 percent nor more than 20 percent organic matter, as determined by loss on ignition of oven-dried samples. The samples shall be thoroughly oven-dried to constant weight at a temperature of 221 degrees F.
- D. The Hydrogen Ion value of all topsoil shall be not less than 5 and not more than 7. After the testing of the samples of material, if the loam is found to be unsatisfactory for the intended use, the Engineer may require that the Contractor, without additional compensation, add to the top soil proposed by him for use, lime, particular fertilizer or particular humus, as directed in order to make the topsoil suitable.
- E. Mechanical Analysis: The sieve analysis on an oven-dried sample shall be as follows:

<u>Sieve Size</u>	<u>% Passing by Weight</u>
1 inch	100
1/4 inch	97-100
# 100	40-60
# 200	40-60

- F. Topsoil available on site which meets the specified requirements may be utilized with the permission of the Engineer. The Engineer may require that the Contractor, without additional compensation, add to the topsoil proposed by him for use, lime, particular fertilizer or particular humus, as directed in order to make the topsoil suitable.
- G. Imported topsoils or soil blends designed to serve as topsoil may not include the following:
 - 1. Soils defined regionally by the Natural Resources Conservation Service web soil survey (or local equivalent for projects outside the U.S.) as prime farmland, unique farmland, or farmland of statewide or local importance; or
 - 2. Soils from other greenfield sites, unless those soils are a byproduct of a construction process.
- H. Restored soil must meet the criteria of reference soils in categories 1–3 and meet the criteria of either category 4 or 5: 1. organic matter; 2. compaction; 3. infiltration rates; 4. soil biological function; and 5. soil chemical characteristics.

CONTRACT NO. 22-522
 DIVISION 32 – EXTERIOR IMPROVEMENTS

	Soil criterion	Restoration to reference soil conditions	Required
1	Organic matter	Amend soils with mature, stable compost material such that top 12 inches (300 mm) of soil (at minimum) contains at least 3% organic matter OR organic matter levels and organic matter depth are comparable to site's reference soil	Yes
2	Compaction	Ensure bulk densities within 100% of root zone, defined as minimum of 12 inches (300 mm) in depth OR depth comparable to site's reference soil	Yes
3	Infiltration rate	Achieve infiltration rates (inches/hour) or saturated hydraulic conductivity (millimeters/second) comparable to site's reference soil	Yes
4	Biological function	Establish capacity of biotic community to decompose organic matter and release mineral (plant available) nitrogen; potentially mineralizable nitrogen is used as proxy (see Table 7.2-B, SITES Guidelines and Performance Benchmarks 2009)	Meet either or both of 4 or 5
5	Chemistry	Match pH, cation-exchange capacity, and nutrient profiles of original undisturbed soil or site's reference soil; salinity must be suitable for regionally appropriate vegetation	

2.2 SEED

A. General: Grass seed shall be fresh, re-cleaned seed of the latest crop. Material other than pure live seed shall comprise only nonviable seed, chaff, hulls, harmless inert matter and shall be free from noxious weeds. The mixture shall have less than one quarter (1/4) of one (1) percent weed content. Seed shall be mixed before delivery and shall consist of the mixture specified and in conformity with the following proportions by weight and meeting with the following standards of seed content. The percentage of purity shown on the label will be acceptable. The percentage of germination shall not be less than the minimum specified.

B. Mixtures

<u>Proportions of Mixture</u>	<u>Mixture Tolerance</u>		<u>Germination Tolerance</u>	
	<u>Minus</u>	<u>Plus</u>	<u>Germination</u>	<u>Minus</u>
90% Red Tall Fescue	3%	5%	90%	6%
10% Classic Kentucky Bluegrass	3%	5%	80%	7%

The following brand name mixtures are approved substitutes: Manhattan, Pennfine, N.K. 200 or Norlea in the proper percentages of mixture or any other current approved brand name mixture.

C. Packaging: All grass seed shall be delivered in unopened standard size bags of the vendor showing weight, analysis and the name of vendor. It shall be stored in such a manner that its effectiveness will not be impaired.

2.3 SOD

A. Materials

1. Sod shall be nursery grown and at least two years old. It shall be free of insects, grubs, fungus disease and noxious weeds and shall have a pH value of not less than 6.5.
2. The cultivated sod shall be 100% Merion grass sod.
3. Sod shall be a minimum of 1 inch thick and cut in uniform strips 1 foot by 4 feet minimum. Root development shall be capable of supporting sod during handling, transporting and laying. Sod shall not be installed in strips less than 1 foot in width.
4. Top growth shall be thick and matted. The turf shall be green and growing. Prior to cutting and transporting, the sod shall be well irrigated and have been recently mowed.
5. Native soil on the roots of the sod shall be maintained during process of transplanting.
6. Fertilizers shall be suitable commercial types.

B. Method

1. The surfaces of the areas to be covered with sod shall be trimmed, topsoiled to a minimum depth of 4 inches and graded to one inch below finished elevation by cutting and/or filling, as required, and as directed by the Owner.
2. The sod bed shall be raked and all foreign matter shall be removed and disposed of from the site.
3. Soil amendments and fertilizers shall be evenly spread over the prepared area and thoroughly raked in to incorporate it with the soil. Lime shall be incorporated in the soil at the rate of 50 pounds per 1000 square feet and superphosphate at the rate of 25 pounds per 1000 square feet.
4. Sod shall then be laid and set to the required grade on a reasonably moist bed with joints staggered. It shall be laid smoothly, edge to edge, and all openings plugged with sod. After laying, the sod shall be pressed firmly into contact with the bed by tamping and rolling to eliminate all air pockets and produce a uniform, even surface true to grade.
5. Sod shall be planted within 24 hours from the time of cutting unless tightly rolled or stored (roots to roots) and the stacks kept moist. Storage for a period in excess of five days will, under no circumstance, be

permitted. Should the completed sod surface become gullied, eroded, or otherwise damaged, the affected areas shall be re-sodded as required and at the Contractor's expense.

6. The Contractor shall be responsible for proper protection and maintenance of the sodded areas. Where sod fails to grow, the Contractor shall prepare and re-sod these areas at his expense. During dry weather the Contractor shall water the sodded area frequently enough to insure growth.

2.4 COMMERCIAL FERTILIZER

- A. Composition: Commercial granular fertilizer shall have the following composition by weight: Nitrogen ten (10) percent; Phosphoric Acid six (6) percent; Potash four (4) percent. The Nitrogen shall be fifty (50) percent organic (from organic sources, e.g., fish meal, dried blood, dried manure, activated sewage sludge castor pomace, cottonseed meal, etc.) and fifty (50) percent inorganic. The elements shall be available according to the methods adopted by the Association of Official Agricultural Chemists.
- B. Packaging: Fertilizers shall be packed in the manufacturer's standard containers weighing not over one hundred (100) pounds each with the name of the material, net weight of contents and the manufacturer's name and guaranteed analysis appearing on each container.

2.5 GROUND LIMESTONE

- A. Composition: Ground limestone (calcium carbonate) shall have the following analysis: At least fifty (50) percent shall pass a two hundred (200) mesh sieve; at least seventy (70) percent shall pass a one hundred (100) mesh sieve; and one hundred (100) percent shall pass a ten (10) mesh sieve. Total carbonates shall not be less than eighty (80) percent or 44.8 percent calcium oxide equivalent; for purposes of calculation, total carbonates shall be considered as calcium carbonate.
- B. Packaging: Ground limestone packed in the manufacturer's standard containers shall weigh not over one hundred (100) pounds each with the name of the material, net weight of contents and the manufacturer's name and guaranteed analysis appearing on each container. Bulk shipments shall be accompanied by a certificate covering the names, weight and analysis as specified herewith for packaged material.

2.6 MULCH-WOOD FIBER

- A. General: Wood fiber suitable for use as mulch for seeding shall be processed so that the fibers will remain in uniform suspension in water under agitation and will blend with grass seed, fertilizer, ground limestone and other additives to form a homogenous slurry. It shall have the characteristics which, upon hydraulic application, shall form a blotter-like ground coating with moisture absorption and percolation properties and the ability to cover and hold grass seed in intimate

contact with the soil. Wood fiber shall contain no growth or germination inhibiting factors and shall be dyed green. The wood fiber mulch shall be Superior Fiber manufactured by Wolbert Master and Assoc. Inc., Silva Fiber as manufactured by Weyerhaeuser or equal.

- B. Packaging: Wood fibers shall be supplied in the manufacturer's unopened standard containers weighing not over one hundred (100) pounds each, with the name of the material, net weight of contents, the manufacturer's name and the air dry weight of fiber (equivalent to ten [10] percent moisture) appearing on each container.

PART 3 - EXECUTION

3.1 GENERAL

- A. When permitted by the Engineer, topsoil excavated under other Sections of this Specification shall be reused to provide a six inch layer of topsoil over the areas required to be seeded. If after backfilling of excavations there are insufficient quantities of top soil conforming to the specified requirements, the Contractor will be required to supply the necessary material to provide a six (6) inch layer of topsoil over the areas to be seeded. Where directed by the Engineer the surface of the subsoil shall be scarified or tilled to a minimum depth of two (2) inches before topsoil or soil is placed to permit bonding of the upper soil layer with the subsoil.
- B. When delays in seeding operations carry the work beyond the specified seasons or when conditions of high winds, excessive moisture or frost are such that satisfactory results are not likely to be obtained for any stage of the work, the Engineer will stop the work. The work shall be resumed with the Engineer's approval when the desired results are likely to be obtained or when approved corrective measures and procedures are adopted.
- C. The Contractor shall be liable for any damage to property caused by seeding operations and all areas disturbed shall be restored to their original conditions to the satisfaction of the Engineer.
- D. One inch of water per week shall be applied on seeded areas for adequate soil saturation as required by weather conditions and as ordered by the Engineer until final acceptance. Watering shall be continued until final payment. Watering shall be done in a manner which will not cause erosion or other damage to the finished surfaces. Any surfaces which become gullied or otherwise damaged shall be repaired to reestablish the grade and conditions of the soil prior to seeding. After the repairs have been made the areas shall be reseeded as specified. Water for seeding is available on site

3.2 GRASS SEEDING

- A. Time of Seeding: Seeding shall be performed from March 1 to April 15 and from August 15 to October 15 unless otherwise approved. The Contractor shall notify the Engineer at least 48 hours in advance of the time he intends to begin seeding and shall not proceed with such work until permission has been granted.
- B. Preparation of Areas: The areas to be seeded shall be cultivated and cleaned of all vegetative growth to a depth of six (6) inches except as otherwise directed by the Engineer on designated areas where topsoil has been furnished and placed to a depth of six (6) inches immediately prior to seeding. All weeds, roots, stumps, large stones and debris shall be removed. All washouts or other surface irregularities shall be repaired and additional topsoil shall be placed over the area as required until the entire area to be seeded is covered with a minimum of six (6) inch compacted layer of topsoil. The areas to be seeded shall then be rough graded to conform to the proper elevations as directed by the Engineer.
- C. Final Preparations of Seed Bed: The areas to be seeded shall be cultivated with a disc, rototiller or scarifier to a depth of four (4) inches. The areas shall be smoothly graded to the proper elevations, free from all unsightly ridges, depressions or undue irregularities. Areas to be seeded that cannot be cultivated by mechanical means shall be scarified by hand to attain the degree of smoothness and uniformity of adjacent lawn areas. Any soft areas shall be thoroughly compacted with an accepted roller weighing at least 200 pounds.
1. All topsoil not used is to be removed and disposed of.
 2. Ground limestone shall be evenly distributed at the rate of one-half (1/2) pound per square yard and worked into the top three (3) inches of the soil during the cultivation required for the final preparation of seed bed.
 3. Commercial fertilizer (10-6-4) as specified shall be evenly distributed at the rate of ten (10) pounds per 1,000 square feet using an approved mechanical spreader and shall be worked into the top one (1) inch of the soil.
 4. In the event that it rains between the time the soil on any area is prepared and before it is seeded by any specified method, the soil on all areas to be seeded shall be completely pulverized to a depth of one inch as determined, directed and approved by the Engineer.
- D. Sowing Seed
1. Grass seed shall be sown evenly at the rate of one hundred fifty (150) pounds per acre. All seeding is to be done on dry or moderately dry soil and at times when the wind does not exceed a velocity of five (5) miles per hour.

CONTRACT NO. 22-522
DIVISION 32 – EXTERIOR IMPROVEMENTS

2. A mechanical seeder may be used such as a Brillion seeder or equal to distribute the seed. Rolling will not be necessary.
 3. If the grass seed is to be sown by hand the seed shall be evenly distributed and lightly raked into the top (1/4) inch of soil. After seeding and raking, the soil surface is to be rolled with an accepted roller weighting at least two hundred (200) pounds.
- E. Seeding with Erosion Control Fabrics: Erosion control fabrics shall be applied in accordance with the seed manufacturers' instructions as modified, directed and approved by the Engineer.

3.3 ESTABLISHMENT OF SEEDED AREAS

- A. The Contractor shall maintain, mow and protect the seeded areas until a uniform stand of grass approximately two and one half (2-1/2) inches high has been obtained (minimum of three cuttings). Any areas which have been damaged or fail to show a uniform stand of grass shall be scarified, refertilized and reseeded with the original seed mixture until all the designated areas are covered with grass.

++ END OF SECTION ++

SECTION 33 05 05

BURIED PIPING INSTALLATION

PART 1 – GENERAL

1.1 SUMMARY

A. Scope:

1. Contractor shall furnish all labor, materials, equipment and incidentals as shown on the Contract Drawings, specified and required to furnish, install and test all buried piping, fittings, specials and appurtenances. The Work includes, but is not limited to, the following:
 - a. All types and sizes of buried piping, except as specified under other Sections. These include, but are not limited to: ductile iron, carbon steel, copper, and thermoplastic.
 - b. Supports, restraints, and thrust blocks.
 - c. Testing.
 - d. Cleaning and disinfecting.
 - e. Also included are installation of all jointing and gasketing materials, specials, couplings, flexible couplings, sleeves, tie rods, corrosion protection, and all other Work required to complete buried piping installation.
 - f. All valves, specials, sleeves and wall pipes shown or specified shall be incorporated into the piping system as required and as specified in the appropriate section of Division 22.
 - g. Unless otherwise shown or specified, buried piping installation includes all buried piping Work required, beginning at the outside face of structure or building foundation.

B. Coordination:

1. Review installation procedures under other Sections and coordinate with the Work that is related to this Section, including concrete, valves, ventilation and electrical.
2. The installation of all buried piping materials specified in Division 22. Coordinate with these Sections.

CONTRACT NO. 22-522
DIVISION 33 – UTILITIES

- C. Related Work Specified Elsewhere:
 - 1. Section 31 00 00, Earthwork
 - 2. Section 03 30 00, Cast-In-Place Concrete

1.2 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies: Comply with applicable requirements of UL and other authorities having jurisdiction.
- B. Reference Standards: Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified:
 - 1. ASTM D 2774, Underground Installation of Thermoplastic Pressure Piping.
 - 2. AWWA C111 (ANSI A21.11), Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
 - 3. AWWA C600, Installation of Ductile-Iron Water Mains and Appurtenances.
 - 4. AWWA M23, PVC Piping.
 - 5. ANSI B31.2, Fuel Gas Piping.
 - 6. NFPA 54, National Fuel Gas Code.

1.3 SUBMITTALS

- A. Shop Drawings: Submit for approval Shop Drawings showing the following:
 - 1. Laying schedules and detailed drawings in plan and profile for all piping.
 - 2. Full details of piping, valves, specials, joints, harnessing and connections to pipes and structures.
- B. Tests: Submit description of proposed testing methods, procedures and apparatus. Submit copies of all test results.
- C. Certificate: Submit certificate of compliance with referenced standards.
- D. Record Drawings: Submit in accordance with the requirements, Project Record Documents.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Handle all pipe, fittings and accessories carefully with approved handling devices. Do not drop or roll pipe off delivery vehicle. Do not otherwise drop, roll or skid pipe.

Materials cracked, gouged, chipped, dented or otherwise damaged will not be approved.

- B. Store pipe and fittings on heavy wood blocking or platforms so they are not in contact with the ground.
- C. Pipe, fittings and specials shall be unloaded and stored in areas designated on the drawings. Interiors shall be kept completely free from dirt and foreign matter.
- D. No material furnished under this specification shall be shipped to the job site until all submittals have been approved.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Pipe bedding and backfill in accordance with Section 31 00 00, Earthwork.
- B. Pipe materials required are listed in the Piping Schedules. Refer to applicable Sections for detailed materials Specifications.
- C. General:
 - 1. Pipe Marking:
 - a. Each piece of pipe or fitting shall be clearly marked with a designation which shall conform with designations shown on the Shop Drawings.
 - b. Class designation shall be cast or painted on each piece of pipe or fitting 4 inches in diameter and larger.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General:
 - 1. All piping shall be sloped to avoid high spots and low spots and to facilitate drainage.
 - 2. Proper and suitable tools and appliances for the safe, convenient handling and laying of pipe shall be used.
 - 3. Install piping as shown on the Contract Drawings, specified and as recommended by the manufacturer.

CONTRACT NO. 22-522
DIVISION 33 – UTILITIES

4. Request instructions from Engineer before proceeding if there is a conflict between the manufacturer's recommendations and the Contract Drawings or Specifications.
5. Pipe, fittings and accessories that are cracked, damaged or in poor condition or with damaged linings will be rejected. At the time of laying, the pipe shall be examined carefully for defects, and should any pipe be discovered to be defective after being laid, it shall be removed and replaced with sound pipe by the contractor at his expense.
6. Minimum cover over buried piping shall be 4 feet unless otherwise shown or approved by Engineer.
7. Earthwork required is specified in Section 31 00 00.

B. Bedding Pipe:

1. Bed pipe with materials as specified below and as shown on the Contract Drawings.
 - a. Trenches shall be excavated to allow for the pipe bedding material required as indicated on the contract drawings. All loose and unsuitable material shall be removed from the trench bottom and backfilled with compacted select fill.
 - b. Pipe embedment material and limits shall be as indicated on the contract drawings placed in accordance with the requirements of Section 31 00 00, Earthwork,
 - 1) .
 - c. Pipe embedment shall be placed in maximum 6-inch layers and compacted for the full width of the trench. Recesses in the embedment shall be provided around each joint to allow space for making joints and inspection.
2. Carefully and thoroughly compact all pipe bedding and fill.
3. No piping shall be laid until Engineer approves the bedding condition.
4. No pipe shall be brought into position until the preceding length has been bedded and secured in its final position.

C. Laying Pipe:

1. Conform to manufacturer's instructions and to AWWA C600, and AWWA M23 where applicable.

CONTRACT NO. 22-522
DIVISION 33 – UTILITIES

2. Install unless otherwise approved by Engineer. Remove all pipe accurately to line and grade shown and relay pipes that are not laid correctly.
3. Slope piping uniformly between elevations given.
4. 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.
5. Start laying pipe at lowest point and proceed towards the higher elevations, unless otherwise approved by Engineer.
6. Place bell and spigot pipe so that bells face upstream unless otherwise approved by Engineer.
7. Excavate around joints in bedding and lay pipe so that only the barrel receives bearing pressure from the trench bottom.
8. Permissible deflections at joints shall not exceed 75 percent of the amount allowed by manufacturer and in no case exceed AWWA standards.
9. Prior to laying pipe, every precaution shall be taken to ensure that no foreign material enters the piping.
10. 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.
11. 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.
12. Every time that pipe laying is not actively in progress the open ends of pipe shall be closed by a watertight plug.
13. Field cutting pipe, where required, shall be made with a machine specially designed for cutting piping. 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.
14. Blocking under piping shall not be permitted unless specifically excepted by Engineer for special conditions. If permitted, conform to requirements of AWWA C600.
15. Repair protective coatings and linings in a satisfactory manner prior to backfilling. Refer to specific pipe specifications for coating systems required.

D. Jointing Pipe:

1. Clean completely all jointing surfaces and adjacent areas immediately before making joint.
2. Lubricate and adjust gaskets and “O”-rings as recommended by manufacturer.
3. After “O”-rings are compressed and before pipe is brought fully home, each gasket shall be carefully checked for proper position around full circumference of the joint.
4. Conform to AWWA C111 and to all applicable manufacturers recommendations pertaining to jointing pipe.
5. For mechanical joints the plain end shall be centered and pushed into the bell and the gasket shall be firmly pressed evenly into the bell. The gland shall be slid to the bell for bolting. All bolts with oiled threads shall be alternately torque tightened 180 degrees opposite to each other to seat the gasket evenly. The maximum torque shall be as follows:

<u>Bolt Size</u> (inches)	<u>Applied Torque</u> (ft-lbs)
5/8	50
3/4	80
1	90
1 1/4	150

All bolts and nuts shall be heavily coated with an approved bituminous or epoxy coating.

6. Solder Joints:
 - a. Ream or file pipe to remove burrs.
 - b. Clean and polish contact surfaces of joints.
 - c. Apply flux to both male and female ends.
 - d. Insert end of tube into fittings full depth of socket.
 - e. Heat joint evenly.
 - f. Apply continuous solder bead around entire circumference of joint.
7. Use hexagon head nuts and bolts on all flanged joints. Bolts shall neither project more than 1/4-inch from, nor fall short of the end of the nut.
8. Use ring gaskets unless otherwise specified or approved by Engineer. Maximum gasket thickness shall not exceed 1/8 inch. Gaskets shall be suitable

for service intended in accordance with manufacturers ratings and instructions.

9. Clean and lubricate bolt threads and gasket faces for flanged joints.
10. All bolts and nuts for underground service on valves, mechanical joint fittings, pipe joint and other ferrous metal appurtenances shall be packed in an asphaltic material. After the joint has been made and the bolts drawn to the proper tension, the joint, including glands, flanges, bolt heads and nuts shall be packed to a minimum thickness of one inch over all surfaces with Talcote, or other equal asphaltic material. Alternatively coat all joint areas and fasteners with two heavy coats of coal tar epoxy.

E. Concrete Trust Blocks:

1. Provide concrete trust blocks as shown, required, or otherwise approved by Engineer.

F. Transitions from One Type of Pipe to Another:

1. Provide all necessary adapters, specials and connection pieces required when connecting different types and sizes of pipe or connecting pipe made by different manufacturers.

G. Closures:

1. Provide all closure pieces shown or required to complete the Work.
2. Locate closures in straight runs of pipe.

H. Backfilling:

1. Conform to applicable requirements of Section 31 00 00 - Earthwork.
2. Backfill by hand until pipe is covered by at least 1 foot of fill.

3.2 WORK AFFECTING EXISTING PIPING

A. Location of Existing Piping:

1. Locations of existing piping shown shall be considered approximate.
2. Contractor is responsible for determining exact location of existing piping to which he must make connections, or which he may disturb during earth moving operations, or which may be affected by his work in any way.

B. Work on Existing Pipelines:

CONTRACT NO. 22-522
DIVISION 33 – UTILITIES

1. Do not take pipelines out of service except where specified or approved by Engineer.
2. Cut or tap pipes as shown or required with machines specifically designed for this work.
3. Install temporary plugs to keep out all mud, dirt, water and debris.
4. Provide all necessary adapters, fittings, pipe and appurtenances required.
5. Refer to Section 31 00 00, Earthwork for additional requirements.
6. The Contractor shall provide a temporary thrust restraint system for existing pipes wherever the installation of new pipes disturbs the existing pipe's thrust restraint. Upon completion of new pipe installation, the Contractor shall restore the existing pipe thrust restraint system to its condition at the onset of the job.

3.3 TESTING OF PIPING

A. General:

1. Test all piping as specified below except as otherwise authorized by Engineer.
2. Notify Engineer 48 hours in advance of testing
3. Provide all testing apparatus, including pumps, hoses, gages, and fittings.
4. Unless otherwise noted, 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.
7. All gas piping shall be tested in accordance with NFPA 54.
8. Unless otherwise approved, conduct all tests in the presence of the Engineer.
9. All pipe shall be tested between valves.

B. Schedule of Pipeline Tests:

1. For pressure test values see "Piping Schedule."
2. Piping not on the schedule shall be tested at 1.5 times the maximum working pressure or 10 psi, whichever is greater.

C. Pressure Test Procedure (Except for Fuel Oil Piping and Gravity Sewer Pipe):

1. Backfill and compaction shall be completed at least to the pipe centerline before testing, unless otherwise required or approved by Engineer. Backfill and compact around all blocking before testing and as required to assure restraint by harnessed joints.
2. Allow concrete for blocking to reach design strength before testing.
3. Fill section to be tested slowly with water and expel all air. Install corporation cocks, if necessary, to remove all air.
4. Test only one section of pipe at a time.
5. Maintain the test pressure for at least 2 hours.
6. Allowable Leakage Rates (in gallons per hour per 1,000 feet per inch diameter) except as otherwise noted:
 - a. Buried Ductile iron and PVC - as specified herein and as specified in AWWA C.600 - Section 4 - Hydrostatic Testing.

<u>Nominal Pipe Diameter (inch)</u>	<u>Allowable Leakage Rate Per 1000 ft of Pipeline (gph)</u>
4	0.34
6	0.50
8	0.67
10	0.84
12	0.01

- b. Exposed Ductile iron and PVC and pipe in tunnels: No leakage.
 - c. Copper, steel and Thermoplastic: No leakage.
 - d. Sodium hypochlorite and caustic Solution: No leakage.
7. All visible leaks shall be made tight regardless of the amount of leakage or results of the leakage tests. If the pipes tested do not meet the leakage requirements of the leakage tests, they shall be repaired and retested as necessary until the leakage requirement is met.
8. All Work found defective shall be repaired or replaced at the expense of the Contractor.

D. Test Procedure for Gravity Sewer Piping:

1. Backfill and compaction shall be completed at least to the pipe centerline before testing, unless otherwise required or approved by the Engineer.

2. After pipe trenches have been satisfactorily backfilled to the required depth, piping shall be checked by the Engineer to determine if any displacement of pipe has occurred. A bright light shall be flashed between manholes. If the illuminated interior of the pipe shows displaced pipe, improper alignment or any other defects, the defect shall be corrected as determined by the Engineer. Upon satisfactory completion of the displacement test, the pipe shall be tested for leakage.
3. The Contractor shall test each section of gravity sewer pipe between manholes for watertightness individually. No continuous sections shall be tested simultaneously.
4. The Contractor shall plug the downstream end of the pipeline under test and all outlets discharging into the upstream manhole.
5. The upstream manhole and the section of pipeline under test shall be filled by the Contractor with water. The elevations to which the manholes shall be filled is a minimum of 2 feet above the crown of the pipe, or at least 2 feet above existing groundwater, whichever is higher.
6. The pipe shall remain filled for an initial 1 hour period to allow for stabilization. Following the stabilization period, water shall be added to the required elevation.
7. Leakage loss shall be measured over a period of 4 hours. After the stabilization period, the Engineer will take 3 readings of the water level in the manhole, and 4 hours later, take 3 more readings. An average of the readings will be used by the Engineer to calculate leakage.
8. If the measured rate of leakage is less than or equal to the allowable leakage rate, the section of pipeline tested is acceptable. If the test fails, the section of pipe must be repaired or replaced at the expense of the Contractor, and retested by the same procedures. Regardless of the results of the leakage test, all visible leaks shall be repaired.
9. The maximum allowable leakage rate for any section of pipeline under testing shall not exceed 200 gallons per inch of internal diameter per mile of pipe per day.
10. At the conclusion of the test, clean all pipelines by flushing with water or other means, and remove any debris which may have entered the pipeline during construction.

3.4 CLEANING AND DISINFECTION

- A. All piping shall be thoroughly cleaned and flushed prior to placing in service in a manner approved by Engineer.
- B. Disinfection:

CONTRACT NO. 22-522
DIVISION 33 – UTILITIES

1. Disinfect all potable water piping wherever installed or relocated.
2. Completely clean interior of all piping and flush piping smaller than 12 inches prior to disinfection with water at a minimum velocity of 2 1/2 feet per second.
3. Conform to procedures described in AWWA C651 except that the tablet method will not be permitted unless otherwise approved by the Engineer.
4. Water for flushing, testing and chlorination shall be furnished by the Contractor.
5. Chlorine shall be supplied by Contractor.
6. Bacteriologic tests shall be performed by Contractor. A certified test laboratory report shall be submitted for approval by the Engineer.
7. Chlorine concentration in the water entering the piping shall be between 50 and 100 parts per million, such that a minimum residual concentration of 25 parts per million will be left after a 24-hour retention period. The operation shall be repeated as necessary to provide complete disinfection.

++ END OF SECTION ++

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SECTION 33 05 19

DUCTILE IRON WATER UTILITY DISTRIBUTION PIPING

PART 1 – GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Concrete for thrust blocks: Section 03 30 00, Cast in Place Concrete
- B. Section 33 05 20, Buried Piping Installation
- C. Section 33 14 17, Site Water Utility Services

1.2 REFERENCES

- A. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
- B. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
- C. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3 inches through 48 inches, for Water and Other Liquids
- D. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
- E. AWWA C115 - Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges
- F. AWWA C150/ANSI A21.50 - Thickness Design of Ductile Iron Pipe
- G. AWWA C151/ANSI A21.51 - Ductile-Iron Pipe, Centrifugally Cast, for Water
- H. AWWA C153 - Ductile-Iron Compact Fittings, 3 inches through 24 inches and 54 through 64 inches, for Water Service
- I. AWWA C606 - Grooved and Shouldered Joints
- J. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners
- K. ASTM B98 - Copper Silicon Alloy Rod, Bar and Shapes
- L. ASTM C283 - Resistance of Porcelain Enameled Utensils to Boiling Acid
- M. DIPRA - Handbook of Ductile Iron Pipe
- N. NY Spec 24-C-38 - Caulking

1.3 DESIGN AND MANUFACTURING REQUIREMENTS

- A. Ductile iron pipe shall conform to the American National Standards Institute (ANSI) and American Water Works Association (AWWA) Standards specified herein and recommendations as given in the Ductile Iron Pipe Research Association (DIPRA) “Handbook of Ductile Iron Pipe.”

1.4 SUBMITTALS

- A. Contractor shall submit Shop Drawings for approval of the Engineer. Submittals shall include, but not limited to, the
1. Shop Drawings.
 2. Results of Certified Shop Tests.
 3. Certified Letters of Compliance.
- B. Shop Drawings shall include, but not be limited to:
1. Catalog data consisting of specifications, illustrations and a parts schedule that identifies the materials to be used for the various piping components and accessories. The illustrations shall be in sufficient detail to serve as a guide for assembly and disassembly.
 2. Complete layout and installation drawings, including plans, sections and cross-sections showing elevations with clearly marked dimensions. Piece numbers which are coordinated with the tabulated pipe layout schedule shall be clearly marked. Scale and size of the drawings shall conform to the Contract Documents. Piping layout drawings shall indicate information on pipe supports, location, support type, hanger rod size, insert type and the load in pounds.
 3. Details of pipe lining, coating, wrapping, insulation and painting of all pipe.
 4. Weights of all component parts.
 5. Tabulated pipe layout schedule shall include the following information for all pipe and fittings: service, pipe size, working pressure, joint type, wall thickness, piece number, and laying length.
 6. Flexible couplings, with harness details if required.
 7. Locations where pipe and valve identification signs will be placed.

1.5 QUALITY ASSURANCE

- A. The pipe and fittings covered by these specifications shall be provided by the Contractor through qualified manufacturers experienced in the fabrication, castings and manufacture of the pipe materials specified herein. The pipe and fittings shall be designed, fabricated and installed in accordance with standards specified herein.

1.6 DELIVERY, STORAGE AND HANDLING

- A. The Contractor shall deliver, store and handle all pipe, fittings and couplings as specified in Contract Documents. Special care in handling shall be exercised during delivery, storage and handling of pipe to avoid damage and setting up stresses. Damaged pipe will be rejected and shall be replaced at the Contractor's expense. Pipe and specials stored prior to use shall be stored in such a manner as to keep the interior free from dirt and foreign matter.
- B. No material furnished under this Section shall be shipped to the job site until all submittals have been approved.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Ductile iron pipe and fittings shall be as manufactured by the following:
1. American Cast Iron Pipe Co., Birmingham, AL
 2. McWane, Inc., Birmingham, AL
 3. United States Pipe and Foundry (U.S. Pipe), Birmingham, AL.
 4. Or approved equal.

2.2 DUCTILE IRON PIPE AND FITTINGS

- A. Pipe shall be in accordance with AWWA C151 for push-on or mechanical joint pipe and AWWA C115 for flanged pipe and shall be of grade 60 42 10 ductile iron. The above standards cover ductile iron pipe with nominal pipe sizes from three (3) inches up to and including sixty four (64) inches in diameter. Working pressure for the pipe shall be as called for in these Standards.
- B. Pipe
1. All ductile iron pipe to be supplied under these specifications shall be manufactured in accordance with ANSI Specification A 21.51/AWWA C 151, latest revision. The thickness class for all ductile iron pipe up to and including 12" shall be class 56. Pipe is to be furnished with push on type

joints per ANSI Specification A 21.11/AWWA C 111, latest revision, complete with gaskets and lubricant.

2. All ductile iron pipe furnished under this contract shall be factory applied double cement lined in accordance with ANSI Specification A21.4/AWWA C 10, latest revision, and seal coated inside and out. Minimum thickness of cement lining shall be as follows: 3" through 12" (inclusive) 1/8" cement lining; 14" through 24" (inclusive) 3/16" cement lining; 30" through 36" (inclusive) 1/4" cement lining.

C. Fittings

1. All fittings shall be "full-bodied" mechanical joint, shall be cement mortar and lined, and fittings of all sizes shall be class 250. All fittings shall be made in accordance with ANSI/AWWA; A21.11/C110, A21.11/C111, latest revision. Sealing gaskets, follower glands, lubricant, tee head bolts and hexagonal nuts shall be provided in sufficient quantities for each fitting. All fittings to be cement lined , NSF61 approved seal coat.
2. Concrete thrust blocks to be provided at all bends and tees in accordance with the detailed drawings.
3. Where compact fittings are shown or indicated, items shall be in accordance with AWWA C153.

D. Joints

1. Unless otherwise specified, all joints for Ductile Iron Pipe shall be Push-On Joints, 2 degrees maximum deflection.

The following type joints shall be used as specified:

2. **PUSH-ON JOINTS** - Push-on joints shall be the Super Bell-Tite Joint of Amstead Industries, the Tyton Joint of U.S. Pipe and Foundry Company, the Fastite Joint of the American Cast Iron Company or such other joint as may be approved as equal by Westchester County. For each bell, there shall be furnished a rubber gasket. All of the above shall conform with the applicable provisions of ANSI Specification A21.11.
3. **MECHANICAL JOINTS** - The joint material shall conform to requirements of ANSI Specification A21.11. The mechanical joint installation shall conform to the latest ANSI Specifications. Surface of joint in contact with rubber gasket seal shall be brushed thoroughly with a wire brush just prior to assembly and all loose rust or foreign material shall be removed. The cleaned surface shall be brushed with soapy water just prior to slipping with torque indicating wrenches. The applied torque shall be within the ranges shown below:

SIZE OF BOLT	TORQUE (Foot-Pounds)
5/8"	40-60
3/4"	50-90
1"	70-100

When tightening bolts, the flanges shall be brought up toward the pipe flanges evenly by partially tightening first the bottom bolt, then the top bolt, then the side bolts and repeating the cycle until all bolts are within the specified torque range. Over stressing of bolts to obtain tightening will not be permitted.

Mechanical joints showing visible leakage at the maximum permitted torque shall be disassembled, thoroughly cleaned and reassembled.

4. FIELD LOK GASKET SYSTEM - Field Lok Gasket Systems shall be as manufactured by the U.S. Pipe and Foundry Company or approved equal.

These gaskets shall be installed on push-on joint pipe.

5. JOINT RESTRAINT SYSTEMS - The Contractor shall provide joint restraint systems to prevent against joint separation of joints on all water main mechanical joint fittings. The materials shall be the Meg-A-Lug restrained joint system as manufactured by EBBA IRON SALES, INC., or approved equal in lieu of the rodding system. The mechanical joint restraint system shall incorporate a restraining mechanism in the follower gland which shall impart a multiple wedging action against the pipe. Glands shall be manufactured of ductile iron conforming to ASTM A536-80. Restraining devices shall be of ductile iron heat treated to a minimum hardness of 370 BHN. All dimensions of each gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA A21.11 and ANSI/AWWA C153/A21.53 of latest revision. Twist-off nuts shall be used to insure proper actuating of the restraining devices. If TR Flex pipe is utilized, pipe and fittings to be restrained shall be TR Flex restrained push-on joint type as manufactured by U.S. Pipe and Foundry Co., or approved equal Restraint for field cut pipe shall be with TR Flex Gripper Rings or approved equal. Where Gripper Rings are to be installed on pipe in the field, the instructions of the pipe manufacturer shall be followed. In addition to the Gripper Rings, the Contractor will install tie-rodding to the first bell on each side of the fittings, or valves.

Where tie rods are used, the manufacturer's recommendation for the number of rods for size and pressure will be followed.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. All ductile iron pipe and fittings shall be installed in accordance with the manufacturer's recommendations, approved shop drawings and as specified in the Contract Documents.
- B. Where insulation is shown or specified in the Contract Documents, it shall be installed after the installation and testing of the pipe.
- C. Where ductile iron pipe is in contact with soils, the pipe shall be encased in polyethylene film in accordance with AWWA C105 to isolate the pipe surface from contact with the soils.
- D. Where field cutting of ductile iron pipe is permitted by the Engineer, ductile iron pipe shall be cut only by means of abrasive saws, hack saws, wheel type cutters or milling type cutters. The use of "squeeze" type pipe cutters and cutting torches will not be permitted. Also, the use of diamond points and dog chisels will not be permitted.
- E. Temporary Bulkheads:
 - 1. Temporary bulkheads shall be furnished at the ends of pipe sections where adjoining pipe have not been completed and are not ready to be connected.
 - 2. All temporary bulkheads shall be removed when they are no longer needed.

3.2 HANDLING AND DISTRIBUTION OF PIPE

- A. Special care in handling shall be exercised during delivery and distribution of pipe to avoid damage. Damaged pipe shall be rejected and replaced at the Contractor's expense. The pipe shall be stored prior to use in such a manner as to keep the interior free from dirt and foreign matter. Any pipe that becomes contaminated shall be mechanically cleaned and then swabbed with a 1% chlorine solution before it is incorporated in the work. It must be stressed that contamination in the line will prolong and impede the disinfection operation. Flushing cannot be too heavily relied upon for cleaning.

3.3 PIPE MARKINGS

- A. Each length of pipe shall be marked with its weight, pressure class, the year it was made, and the word "Ductile".

3.4 CONNECTIONS TO EXISTING SYSTEM

- A. Permanent connections are to be made to the existing distribution system at the locations shown on the Contract Drawings and shall be made up to conform to the

details as shown. The Contractor shall verify by test pit excavation the location of the existing pipe where excavations are to be made. No pipe laying will be started until required test pits have been excavated where connections are to be made or at the direction of the Engineer.

3.5 PIPE BEDDING

- A. All pipes shall be laid on 6 inches of clean crushed stone which has been hand trimmed and compacted. The crushed stone shall be carried to the mid-diameter of the pipe, compacting in 6-inch layers. Bell holes shall be excavated in the bedding to provide the pipe with full length bearing. The material shall be well graded and the nominal size shall be 1/4 to 3/4-inch range. No recycled concrete shall be used for bedding.

3.6 LAYING PIPE

- A. Proper and suitable tools and appliances for the safe and convenient handling and laying of pipe and fittings shall be used and shall in general agree with the manufacturer's recommendations. Deflections, however, shall not exceed 50 percent of the maximum amounts recommended. Deflections are to be performed after the pipe has been brought home in straight alignment. Care shall be taken to prevent the bell and cementing lining from being damaged. Any damaged pipe shall be repaired or replaced by the Contractor to the satisfaction of the Engineer.
- B. The pipe and fittings shall be thoroughly cleaned and carefully examined at the time of laying and no pipe or fitting shall be installed which is known to be defective. If any such pipe or fitting shall be discovered to be defective after being laid, it shall be removed and replaced with a sound pipe or fitting by the Contractor at his expense.
- C. The Contractor shall lay the pipe to conform to the lines and grades shown on the Contract Drawings or as directed by the Engineer. Following preparation of the subgrade, the pipe or fitting shall be carefully lowered into the trench so as to prevent dirt and other foreign substances from gaining entrance into the pipe. The pipe shall be clean inside, and both bell and spigot rings shall be examined carefully and burrs or spelter which might cut the rubber ring shall be removed.
- D. When it is necessary to cut ductile iron pipe in the field, such cuts shall be made carefully in a neat workmanlike manner using approved methods to produce a clean square cut. The outside edge of the cut end shall be conditioned for use by filing or grindings a small taper, at an angle of about 30°. If it is necessary to cut TR-Flex pipe in the field, such cuts shall be made to allow for one end to have the manufacture's "weldment" for installation into TR-Flex pipe or fittings. This requirement will also be necessary for the use of Gripper Rings or equal.

- E. At the close of work each day, the end of the pipeline shall be tightly sealed with a cap or plug so that no water, dirt or other foreign substance may enter the pipeline and this plug shall be kept in place until pipe laying is resumed.

3.7 THRUST BLOCKING

- A. Concrete blocking shall be provided at plugs, tees, bends, hydrants and at other locations as may be designated by the Engineer where a sizable unbalanced thrust will be developed. The blocking shall be, in general, of such shape and form that the load due to the thrust shall not exceed 2 tons per square foot against earth or 5 tons per square foot against rock when the water pressure in the line is carried at the test pressure. The excavation at such locations shall receive special attention with such hand trimming as may be required to provide a good bearing against undisturbed materials within as short a distance as possible from the pipe or fitting.
- B. Where reactions are in the vertical plane, provisions to restrain the thrust shall be made to meet the existing field conditions by concrete anchorages.
- C. Concrete shall conform to Item 03 30 00, "Cast-in-place Concrete", for thrust blocks are shown on the Contract Drawings and additional concrete thrust blocks ordered by the Engineer.

3.8 REMOVAL AND DISPOSAL OF WATER

- A. The Contractor shall provide and maintain ample means and equipment for dewatering and properly disposing of all water and sewage flows entering the trenches and other parts of the work. The excavation shall be maintained in a dry condition and no foundation materials, pipe or concrete shall be placed in water unless approved by the Engineer. Water and sewage flows shall be disposed of in a manner avoiding injury to property or inconvenience to the public with the approval of the Engineer. All costs for dewatering as specified will be included under this Item for payment. Costs shall also include continuous pumping and all labor to maintain a continuous system. Any disposal of water to existing storm systems or waterways shall be filtered by the use of hay bales or other filtering systems (See 1.40). Absolutely no silt will be allowed to enter these systems.

3.9 EXISTING STRUCTURES

- A. With exception of water, gas and sewer service connections, all known structures, including piping for water, sewers and drains, manholes, pavements, sidewalks, walls, fences, hydrants, poles and similar structures located on, or adjacent to, the proposed work are shown on the Contract Drawings. Such information is shown for the convenience of the contractor but is not guaranteed to be correct or complete. The location of underground structures shown may be inaccurate, and obstructions other than those shown may be encountered. The Contractor shall hereby distinctly understand that the Owner is not responsible for the correctness or sufficiency of the information given; that he shall have no claim for delay or extra compensation

on account of incorrectness, insufficiency or absence of information regarding obstructions revealed or not revealed by the Contract Drawings; and that he shall have no claim for relief from any obligation or responsibility under the contract because the extent, location, size or character of any pipe or other underground structure is incorrectly shown or has been omitted from the Contract Drawings.

- B. The location of the pipe to be laid as shown on the Contract Drawings is in accordance with the best information available as to the obstructions to be avoided, but can be considered only as approximate and may be changed by the Engineer if the progress of the work reveals other obstructions.

3.10 INTERRUPTED SERVICES

- A. The Contractor shall notify affected property owners at least forty-eight (48) hours in advance of his intent to open a trench or interrupt any public service. The Contractor shall again notify such affected owners at least three hours in advance of the contemplated operation.

3.11 MAINTENANCE OF OPERATIONS

- A. It is essential to the public health and safety that the operation of any public and private water supply, sanitary sewer and storm sewer services be maintained. The Contractor will be required to work in close cooperation and coordination with the Owner and its duly authorized agents to ensure that a minimum of interruptions of operations and nuisances result from his procedures. Only such interruptions of operations as are approved by the Engineer will be permitted.

3.12 MAINTENANCE OF UTILITY SERVICES

- A. Utility services to customers shall be maintained at all times except when interruptions are specifically permitted by the Owner or the authority having jurisdiction thereover.
- B. Gas, electric, water and any other services with the exception of drains which are found, in the opinion of the Engineer, to require relocation either in alignment or elevation shall be so relocated by the Utility at the Owner's request. The Contractor shall coordinate each relocation with the Owner and shall have no claim for delay.
- C. Existing storm drains where noted on the Contract Drawings that require relocation in elevation, including modification of inlets or catch basins shall be included for payment under this item.
- D. Storm drains or drains (not noted on the Contract Drawings) that are found, in the opinion of the Engineer, to require relocation either by alignment or elevation shall be so relocated by the Contractor and paid for as extra work.
- E. Services which are damaged by the Contractor during construction and which do not require relocation shall be repaired or replaced at the expense of the Contractor.

- F. Sanitary sewers may require bypass pumping at water main crossings and locations where the sewers run parallel to the new water mains. The Contractor shall be responsible for bypassing. All costs associated with bypassing shall be included for payment under this Item.

3.13 PROTECTION OF PROPERTY AND STRUCTURES

- A. The Contractor shall, at his own expense, sustain in their places and protect from direct or indirect injury all pipes, poles, conduits, walls, buildings and other structures, utilities and property in the vicinity of his work. Such sustaining and protecting shall be carefully done by the Contractor and as required by the company or party owning the structure or department controlling it. The Contractor shall take all risks attending the presence or proximity of pipes, poles, conduits, walls, buildings and other structures, utilities and property in the vicinity of his work and he shall be responsible for all damage and assume all expense for direct or indirect injury, caused by his work, or to any person or property by reason of injury to them whether such structures are or are not shown on the Contract Drawings.

3.14 CONNECTION TO EXISTING MAINS

- A. Where connections are to be made to existing pipe, the locations of the existing mains are approximate. The Contractor shall verify by test pit excavation the location of the existing pipe where connections are to be made. The existing pipe is active, and all precautions shall be made to prevent pipe separation when excavating in the vicinity of the thrust blocks and when removing the thrust block to make the connections. The cost to excavate, backfill and restore the test pit shall be included under this item.
- B. The Contractor's attention is directed to the possibility that compressed air may be present behind plugs and caps to be removed. Before removing thrust blocks at ends of plugs and caps, or before loosening plugs and caps on restrained pipe, the pressure behind the plugs and caps must be relieved by operation of existing corporation stops, house service connections, hydrants, or other positive means. The cost for making connections to existing mains shall be included under this Item.

3.15 FLUSHING AND TESTING

- A. The Contractor shall flush, hydrostatic test, and disinfect in this sequence the pipeline as follows:
- B. Keep Pipe Clean and Dry - Precautions shall be taken to protect pipe interiors, fittings and valves against contamination. Pipe delivered for construction shall be strung so as to minimize entrance of foreign material. When pipe laying is not in progress, as, for example, at the close of the day's work, all openings in the pipeline shall be closed by watertight plugs. Joints of all pipes in the trench shall be completed before work is stopped. If water accumulated in the trench, the plugs shall remain in place until the trench is dry.

- C. If dirt that, in the opinion of the Engineer will not be removed by the flushing operation enters the pipe, the interior of the pipe shall be cleaned and swabbed as necessary with a 5 percent hypochlorite disinfecting solution.
- D. Flushing - The Contractor shall flush the pipeline in sections governed by the sources of clean water and suitable discharge points. The pipe section shall be flushed until the water runs clear. The Contractor is advised that flushing does not create sufficient velocities to clear the pipeline of matter that may cause an unsatisfactory bacteriological test. Permission of the Engineer to stop flushing or directions to continue flushing shall involve no responsibility for the results of the bacteriological tests.
- E. Hydrostatic Tests - The Contractor shall make hydrostatic tests upon all sections of the pipeline in the presence of the Engineer. The hydrostatic tests shall be made in accordance with Westchester County Department of Health and AWWA Standard C600, Section 4-Hydrostatic Tests, and latest Edition and to the test gradients shown on the Contract Drawings.
- F. The Contractor shall furnish, install, complete with reaction blocking, necessary plugs and caps required for this operation. Main line valves shall be utilized wherever possible to segregate test sections except as directed by the Engineer.
- G. The Contractor shall furnish all test equipment including pumps, gages and meters. The test equipment shall be approved by the Engineer. Calibration tests shall be furnished.
- H. The line shall be filled with water for a period of no less than 24 hours then subjected to test pressure of 150 psi. During this test, the measured leakage over a period of 2 hours shall not exceed 50% of the allowable quantities as indicated in AWWA Standard C600, Section, 4, Hydrostatic Testing, for the size of pipe being tested. All air shall be purged from the line before testing.
- I. The contractor shall notify the Westchester County and the Engineer at least 48 hours prior to performing any testing.
- J. The contractor shall retain, at the contractor's cost, a Licensed Professional Engineer to witness all testing and perform the necessary certifications and filings for acceptance of the completed works.

3.16 DISINFECTION

- A. Disinfect pipe and fittings in accordance with Section 331300 after completion of pressure and leakage tests.

+ + END OF SECTION + +

NO TEXT ON THIS PAGE

SECTION 33 12 16

WATER UTILITY DISTRIBUTION VALVES

PART 1 - GENERAL

1.1 SUBMITTALS

- A. Valve Schedule: Submit the valve schedule listing type of valve, manufacturer's model number and size, for each valve type required.
- B. Product Data: Catalog sheets and specifications for each valve type and size and all other items required by this Section.

1.2 DESCRIPTION

- A. Provide all labor, materials and equipment necessary to furnish, deliver and install valves as shown on the plans. Included hereunder is excavation and backfill; granular bedding; disposal of excess materials; sheeting and shoring; dewatering; protection of watermain structures; saw cutting and removal of pavements; temporary asphalt pavement; valve extension box.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Mueller Valve Co., 500 W. Eldorado St., Decatur, IL 62525, (217) 423-4471, or approved equal.

2.2 MECHANICAL JOINT VALVES

- A. Both Tapping and Standard Valves shall be of the resilient gate type manufactured by Mueller Company, Decatur, Illinois, 62525. Valves shall open right (clockwise) and shall fit the Tapping Sleeve supplied. Gate valves 2-inches to 12 inches shall be series 2360. Tapping valves shall be series T2360. All valves are to be designed for a 200 pound per square inch working pressure and 400 pound per square inch test pressure. Tapping Valves shall be compatible with the S-54 Tapping Machine as manufactured by U.S. Pipe and Foundry, Burlington, New Jersey.
- B. Mechanical joint tapping sleeve shall be models: H-615, H-616; ANSI B 16.1, class 125 certified ANSI/NSF 61 as manufactured by Mueller Company.

2.3 MATERIALS

- A. Body:
 - 1. Cast Iron: ASTM A-126 Class B, higher strength cast iron.

2. Ductile Iron: ASTM A-536 Grade 65-45-12.
3. Bronze: For use up to 150 WSP, ASTM B-62; over 150 to 300 psig WSP, ASTM B-61.

B. Stem:

1. Cast Manganese Bronze: ASTM B-584.
2. Cast Silicon Brass: ASTM B-584.
3. Rolled Silicon Brass: ASTM B-98 Alloy D.
4. Rolled Aluminum Bronze: ASTM B-150 Alloy 1.
5. Rolled Manganese Bronze: ASTM B-138 Alloy A (half hard).
6. Naval Brass: ASTM B-21 Alloy A or Alloy C (hard).
7. Silicon Bronze: ASTM B-371 Alloy C69400.
8. Stainless steel, Type 304.

2.4 CORPORATION STOPS

- A. Ground key type unless otherwise noted. Acceptable Manufacturer: Mueller Co.

2.5 CURB STOPS

- A. Round-way, ground key type unless otherwise noted. Acceptable Manufacturer: Mueller Co.

2.6 VALVE BOXES

- A. Cast iron adjustable type box and cover extending from the valve to final grade. Cover of box shall be complete with an indicating arrow cast on it denoting direction of valve opening.

2.7 VALVE KEYS

- A. Furnish one steel socket key for each five valves of the same size or less. For each additional five valves of one size or multiple thereof, furnish one additional key. Provide service box keys, for valves less than 3 inches in size with stationary rod, where required by the service or noted. Acceptable Manufacturer: Mueller.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install valves of type and kind as indicated on the drawings, each complete with operator and accessory items as required by the actual location. Size valves the same size as the piping in which they are installed, unless otherwise indicated.

3.2 VALVE BOXES

- A. Install a valve box and cover, extending from the valve to final grade, for each gate valve buried in the ground.

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 33 12 17

INSERTION VALVE (LIVE SHUT DOWN)

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Furnish and install Insertion Valves of the size and type specified.

1.2 REFERENCES

ASTM A 36 - Standard Specification for Carbon Structural Steel.

ASTM A 105 - Standard Specification for Carbon Steel Forgings for Piping Applications.

ASTM A 181 - Standard Specification for Carbon Steel Forgings, for General-Purpose Piping.

ASTM A 283 - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.

AWWA C207- Steel Flanges for Pipes

AWWA C223- Fabricated Steel and Stainless Steel Tapping Sleeves

AWWA C509- Resilient-Seated Gate Valves for Water Supply Service

AWWA C515- Reduced-Wall, Resilient-Seated Gate Valves

AWWA C 111 - American National Standard for Rubber Gasket Joints for Ductile- Iron Pipe and Fittings for Water.

ASME 816.5 - Pipe Flanges and Flanged Fittings.

1.3 RELATED SECTIONS

1. Section 33 05 05, Buried Piping Installation
2. Section 33 05 19, Ductile Iron Water Utility Distribution Piping
3. Section 33 12 16, Water Utility Distribution Valves
4. Section 33 14 17, Site Water Utility Services

1.4 DEFINITIONS:

- A. Insertion Valves are line stop type valves used for isolating sections of existing water line when existing valves do not exist or are deemed inoperable.
- B. Line is stopped/plugged when 95 percent or more of pipe's existing water flow has been stopped.

1.4 SUBMITTALS

- A. Conform to requirements of Submittals section of Contract.
- B. Submit qualifications and certificate from manufacturer certifying operators are qualified to operate manufacturer's pipe plugging equipment.
- C. Submit qualifications of hot tap operating technician as being certified by manufacturer to operate hot tapping equipment.
- D. Submit qualifications of manufacturer verifying a minimum of 5 years of experience performing hot tapping operations.
- E. Submittal must include manufacturer's cut sheet and order data sheet that lists among other information, valve orientation, gearing if applicable, if the valve is to be blind flanged or will be a permanent installation with valve box assembly, and other information related to tapping sleeve such as the type of steel, type of nuts, bolts and washers, type of coating, class of flange, and pressure rating of body all meeting the requirements listed in the descriptions under Materials.
- F. Submit six (6) sets of shop drawings for approval prior to start of fabrication. Identify any special procedures required during and or after tapping procedure for the specified pipe material being tapped.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Valve materials meeting AWWA Standards C-509 or C515
- B. Acceptable manufacturer:
 - 1. Team Industrial Services, Insert Valve 4"-16", for vertical or horizontal installation. Miter gearing required on horizontal installation.

- C. Tapping Sleeves: Steel Full-Body Type for Line Stops AWWA C223, fabricated from carbon steel meeting ASTM A283 Grade C or ASTM A36
- D. Acceptable Manufacturers/Models:
 - 1. For use on Cast Iron, Ductile Iron and PVC Pipe: JCM Industries, Inc, JCM 444ESS with 304 stainless steel nuts, bolts, and washers, AWWA C207 Class D blind flange, minimum 200 psi rated body and flange, minimum 12 mil thick epoxy coating inside and out on all components OR Pre-approved equal meeting AWWA C223, fabricated from carbon steel meeting ASTM A283 Grade C or ASTM A36. Sleeves must have mechanical joint ends on the body conforming to AWWA C110 and C111; a flanged outlet conforming to AWWA C207 Class E and must include plain MJ gaskets, split MJ glands and side flange gaskets. Outlet flange must be threaded for completion plug installation.

PART 3 – EXECUTION

3.1 CONSTRUCTION METHOD

- A. Pipe Preparation:
 - 1. Thoroughly clean pipe down to factory supplied outside diameter. Carefully inspect pipe, especially at point where field welding will take place.
 - 2. Conduct an ultrasound test to verify pipe wall thickness to ensure sufficient wall thickness is present in pipe to permit safe field welding of hot tap/line plugging saddle.
 - 3. Grind spiral welds flush with outside of main prior to installation of saddle.
- B. Tapping Sleeve Installation:
 - 1. Place top half of saddle with flanged outlet at the 12 o'clock position on pipe, unless otherwise approved by Owner's Representative. Install sleeve in accordance with manufacturer's recommendations. In no case will saddle or attachments be retrofitted while it is on pipe, unless otherwise approved by Owner's Representative. Any misalignment in Installation will require removal of saddle from pipe.
 - 2. If line stop type valve is unsuccessful in reducing 95 percent of existing water flow, mechanically clean interior of pipe as approved by the Engineer. Do not damage pipe's interior lining during mechanical cleaning.

CONTRACT NO. 22-522
DIVISION 33 - UTILITIES

3. Successful installation will result in reducing approximately 95 percent of existing water flow. Anticipate water leakage from pipe plug and include cost of water removal in unit price bid.
4. Conduct pipe excavation in accordance with specification Section 33 05 05, Buried Pipe Installation.
5. Pressure Testing: After sleeve is attached and before line tapping procedure begins, pressure test saddle in accordance with specification 33 05 19, Ductile Iron Water Utility Distribution Piping.
6. Tap Procedure: Perform tap in accordance with specification 33 05 19, Ductile Iron Water Utility Distribution Piping.
7. Plan water line stop procedure in such a manner and at such hours to minimize disruption and inconvenience to the public. Notify Owner's Representative at least 48 hours in advance of procedure.
8. The Contractor will operate all valves necessary to make shutoffs on existing water mains under the supervision of the Engineer. Notify the Engineer and Owner on the job at least 72 hours prior to the desired time for any shutoff.
9. Conduct line stop operations in presence of the Engineer. Continue water line stop valve installation work without interruption until operation is complete and water line is successfully plugged. Perform related work on connection to water main or associated work requiring installation of an isolation valve continuously and without interruption.
10. When left in place as a permanent valve, the depth of cover to the operating nut must be at least 18 inches to accommodate a valve box assembly, regardless of valve orientation. Gearing is required on horizontal valves and on valves 24 inches and larger regardless of valve orientation.
11. Apply external coating to saddle, flange and water main.

PART 4 – MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. This item will be measured by each 12” diameter Insertion Valve, furnished and installed.

4.2 PAYMENT

- A. The work performed, and materials furnished in accordance with item and measured as provided under “Measurement” will be paid for at the unit price bid for Insertion Valve (complete) of the size and type specified. This price is full compensation for dewatering, trenching, excavation and backfill, preparation of existing pipe and valve box for permanent installations, and will include all materials, labor, equipment, tools, testing and incidentals necessary to complete the work

++ END OF SECTION ++

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SECTION 33 12 19

WATER UTILITY DISTRIBUTION FIRE HYDRANTS

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 33 05 19, Ductile Iron Utility Pipes.
- B. Section 31 23 33, Trenching and Backfilling.
- C. Section 33 12 16, Water Utility Distribution Valves.

1.2 QUALITY ASSURANCE

- A. Approved Manufacturers: Clow, Darling, Kennedy, Mueller, Waterous Company.

1.3 SUBMITTALS

- A. Product Data: Catalog cuts of fire hydrants and appurtenances.
- B. Certificate: Furnish written certification indicating the AWWA C-502 required tests on materials and completed hydrants have been accomplished.

PART 2 - PRODUCTS

2.1 FIRE HYDRANTS

- A. New hydrants shall be Super Centurion 250, Model A-423, three-way type, dry barrel and Traffic Model design, with Aqua-Grip, as manufactured by Mueller Company and American B-62-B-5, and conform to the latest revision of AWWA C502 Standards with 5.25-inch diameter main valve. Also the hydrant shall:
 - 1. be rated for 250 psig (1723kPa) maximum working pressure;
 - 2. have a high flow capacity with 6-inch mechanical joint inlet connection;
 - 3. three-way nozzle arrangement of one pumper nozzle and two hose nozzles. The hose nozzles shall have 2.5-inch nominal inside diameter (ID) and 3-inch outside diameter (OD) with eight (8) threads per inch –type of thread – New York Corporation. The pumper nozzle shall have 4.5-inch ID and 5.75-inch OD with four (4) threads per inch – type of thread – National Standard;
 - 4. have a 1.5-inch pentagon shaped operating nut that opens counter-clockwise;

5. have five (5) feet of bury, unless otherwise noted.

2.2 MISCELLANEOUS MATERIALS

- A. Paint: Hydrant manufacturer's standard primer and 2 finish coats of rust inhibitive, high gloss alkyd enamel. Match color of other hydrants at the Facility.
- B. Crushed Stone: DOT No. 3A; comply with the material requirements of NYSDOT Section 703-02.
- C. Tools: Furnish 2 wrenches to fit fire hydrants. Deliver wrenches to the Director's Representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The fire hydrant shall have a 6-inch, cement lined DIP lateral that connects the hydrant with a new/existing water main. A 6-inch resilient wedge valve that opens clock-wise shall be installed between the hydrant and the supply main to permit isolation of the hydrant for maintenance purposes.
- B. A valve box shall be provided for the valve. The valve box shall be of three piece, cast iron construction, and adjustable screw-type with 5-1/4-inch shaft. It shall be designed for heavy traffic. The cover shall be round and shall be marked "WATER."
- C. The valve box shall be placed on concrete and shall be centered plumb over the operating nut of the valve. It shall be adjusted so that the cover will be flush with the finished grade of the pavement or ground.
- D. Hydrants shall be cleaned and their operation checked before installation. The hydrant barrel shall be set so that the pumper or hose nozzle cap will be 24 inches from the gutter face of the road's curb or as directed by the Engineer.
- E. When hydrant is set in the median between the curb and the sidewalk or between the sidewalk and the property line than, no portion of the hydrant or nozzle cap shall be within 12 inches of the sidewalk.
- F. The hydrant shall stand plumb and shall be set to the established grade, with nozzles at least 18-inches above the ground, as shown on drawing or as directed by the Engineer.
- G. The pumper outlet nozzle shall face the street and the hose nozzles shall be parallel with the curb.
- H. The hydrant shall rest on a block of concrete of adequate size. Thrust blocks shall

CONTRACT NO. 22-522
DIVISION 33 - UTILITIES

be placed against undisturbed ground. It shall be strapped with rods in two distinct operations.

- I. The tee at the supply main shall be rodded to the hydrant branch valve and then from the valve to the hydrant. The tie rods shall be $\frac{3}{4}$ -inch diameter cold rolled steel, full threaded. The hydrant base shall be surrounded by $\frac{3}{4}$ -inch clean crushed stone/gravel to a level of 6-inches above the drain outlets (weep-holes). The stone shall be extended at least 1-foot on all sides of the hydrant. The stone shall be covered with 8-mil polyethylene or similar waterproof material before backfilling.
- J. An assurance shall be made that the weep holes are clear and the hydrant properly drains after use.
- K. The newly installed hydrant shall be disinfected and tested for proper drainage in accordance with AWWA Standards. Any hydrant that does not properly drain shall be re-excavated and corrections shall be made to ensure proper drainage.
- L. The area that was disturbed during the installation/replacement of the hydrants shall be restored to match the existing conditions.

++ END OF SECTION ++

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SECTION 33 13 00

DISINFECTION OF WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.1 QUALITY ASSURANCE

- A. Conform to provisions of AWWA C-651 for water line disinfection. Do not use Tablet Method therein.
- C. Comply with all requirements of the New York State Department of Health for disinfection of potable water lines, valves, hydrants, storage tanks, and appurtenances.

1.2 SUBMITTALS

- A. Contract Closeout Submittals:
 - 1. Test Results.

PART 2 - PRODUCTS

2.1 DISINFECTANT

- A. Chlorine Gas meeting AWWA B301.
- B. Hypochlorites meeting AWWA B300.

2.2 TEST KITS

- A. High range test kit for chlorine residual (0-200 mg/1) Hach Chemical Co. Model CN-21P.
- B. DPD chlorine residual test kit (0-3.5 mg/1) Hach Chemical Co. Model CN-66.
- C. Test kits to remain property of the Contractor.

PART 3 - EXECUTION

3.1 DISINFECTION - WATER MAINS

- A. Flush mains with clear water at a minimum rate of 2.5 fps prior to disinfection. See Table 1.

TABLE 1 - WATER MAIN FLUSHING DATA		
PIPE DIAMETER (INCHES)	FLUSHING RATE GPM @ 2.5 fps	HYDRANT OPENINGS @ 40 psi
2	25	one - 2-1/2
4	100	one - 2-1/2
6	220	one - 2-1/2
8	390	one - 2-1/2
10	610	one - 2-1/2
12	880	one - 2-1/2
14	1200	two - 2-1/2
16	1570	two - 2-1/2
18	1985	two - 2-1/2
24	3525	one - 4-1/2 and one - 2-1/2

- B. Chlorine Gas: Apply with a solution-feed chlorinator in combination with a booster pump for injecting the chlorine gas-water mixture into the main. Do not use direct feed chlorinators.
- C. Hypochlorites: Apply solutions to water mains with a gasoline or electrically powered chemical feed pump designed for feeding chlorine solutions.
- D. Application (Continuous Feed Method).
 1. Connect chlorinator or force pump to water main upstream from point of repair or replacement, or new lines.
 2. Proportion application rate of chlorine solution to obtain a minimum concentration of 50 mg/l of available chlorine. Use high range test kit to determine concentration. See Table 2.

TABLE 2 - QUANTITY OF DISINFECTANT REQUIRED FOR 50 mg/l OF AVAILABLE CHLORINE PER 100 FT. OF PIPE

PIPE DIAMETER (INCHES)	POUNDS		OUNCES			QUARTS	
	CL GAS	SOLUTION	HYPOCHLORITE				
		70%	70%	14.7%	5.25%	14.7%	5.25%
2	0.1	0.1	0.2	0.8	2.1	0.1	0.1
4	0.1	0.1	0.6	3.0	8.3	0.1	0.3
6	0.1	0.1	1.4	6.7	18.7	0.2	0.6
8	0.1	0.2	2.5	11.9	33.2	0.4	1.1
10	0.2	0.3	3.9	18.5	51.9	0.6	1.6
12	0.3	0.4	5.6	26.7	74.7	0.9	2.4
14	0.4	0.5	7.6	36.3	102.0	1.2	3.2
16	0.5	0.7	10.1	47.5	133.0	1.5	4.2
18	0.6	0.8	12.6	60.0	168.0	1.9	5.3
24	1.0	1.4	22.4	107.0	298.0	3.4	9.4

- In the absence of a meter, determine rate either by placing a pitot gage at discharge or by measuring the time to fill a container of known volume. See Table 3.

TABLE 3 - TIME FOR DISINFECTANT TO FLOW THROUGH			
100 FT. OF PIPE - MINUTES			
PIPE DIAMETER (INCHES)	@ 25 GPM	@ 100 GPM	@ 500 GPM
2	0.7	0.2	0.04
4	2.6	0.7	0.13
6	5.9	1.5	0.3
8	10.5	2.6	0.5
10	16.3	4.1	0.8
12	23.5	5.9	1.2
14	32.0	8.0	1.6
16	41.8	10.5	2.1
18	52.9	13.2	2.7
24	94.0	23.5	4.7

4. Continue to apply chlorine solution until it reaches discharge. Check for the presence of chlorine at discharge by adding an orthotolidine reagent. In the presence of chlorine the reagent will turn red.
5. Maintain chlorinated water in the main for a minimum of 24 hours. At the end of this period chlorine concentration shall be at least 25 mg/l. Use high range test kit to determine concentration.
6. Operate all valves and hydrants to insure their proper disinfection.
7. Prevent back flow of super chlorinated water into existing distribution system.

E. Final Flushing:

1. After a 24-hour retention period, flush main until maximum chlorine concentration is 1.0 mg/l. Use DPD chlorine residual test kit.

CONTRACT NO. 22-522
DIVISION 33 - UTILITIES

2. Discharge super chlorinated water in a manner that will not adversely affect plants and animals. Comply with applicable State regulations for waste discharge.
- F. Bacteriological Tests: Contact local health units for sampling criteria and procedures. Local health units may have more stringent criteria.
1. Test water main for bacteriological quality before putting pipe into service. A minimum of two successive sets of samples shall be taken at 24-hour intervals. Both sets of samples shall indicate bacteriological safe water before putting the facility in operation. Pay all expenses incurred for testing.
 2. Tests shall be conducted by a laboratory approved by the New York State Health Dept.
- G. Give all test results to Director's Representative.
1. Should test results prove any part of the system bacteriologically unsafe, repeat disinfection procedures until satisfactory results are obtained.

++ END OF SECTION ++

NO TEXT ON THIS PAGE

SECTION 33 14 17

SITE WATER UTILITY SERVICES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Water Services, as shown on the Plans.

PART 2 – PRODUCTS

2.1 CORPORATION STOPS

- A. Corporation stops shall be Mueller "H-15000", or approved equal, and shall be equipped with the standard AWWA C800-66 inlet thread.
- B. The maximum size corporation stop permitted in the barrel of Gray-Iron or Ductile- Iron Pipe, without the use of service clamps, shall be as follows:

Watermain Pipe Size (inches)	4	6	8	10	12	16
Tap Size (inches)	3/4	3/4	1	1-1/2	1-1/2	2

- C. Connections larger than those appearing in the above table shall be made with a service clamp.
- D. Service clamps shall be Mueller "Single Strap Mueller Corporation Stop Thread", or equal, for services 1-inch and smaller and Mueller "Double Strap Mueller Corporation Stop Thread", or equal, for service 1-1/4 inch and larger.

2.2 COPPER TUBING

- A. A continuous length of copper tubing shall be used between the corporation and curb stop, between curb stops, or between the curb stop and the blowoff, unless specifically permitted by the Engineer.
- B. Copper Tubing shall be seamless, Type K, soft drawn, conforming to ASTM B88, and shall be used for all general water service connections in the nominal sizes of 3/4", 1", 1-1/2" and 2" unless otherwise specified.
- C. Couplings for joining copper tubing shall be a Mueller "H15405", or approved equal.

2.3 SERVICE BOXES

- A. Service boxes used with curb stops of 1-1/4-inch size and smaller shall be Buffalo type, Mueller "H-10350", or approved equal.
- B. All service boxes shall be telescopic and shall have a collapsed length of 4 feet and a fully extended length of at least 5-1/2 feet. Covers shall be furnished with the word "WATER" cast in and provided with a cover bolt.
- C. Curb stops shall be the Mark II Oriseal type as manufactured by the Mueller Company, "H-15204", or approved equal.

PART 3 - EXECUTION

3.1 EXECUTION

- A. The Contractor shall furnish and install Type K copper tubing as directed or as shown on the Contract Drawings. The curb stops and boxes shall be located as shown on the Contract Drawings or as directed. All copper tubing shall be laid at a minimum depth of 5 feet from final grade. All joints shall be watertight.

3.2 HIGHWAY CROSSING

- A. All water services crossing public highways, roads or streets shall be installed by jacking, boring or rodding. Installation by use of water jets is prohibited except by written permission of the authority having jurisdiction.

PART 4 - MEASUREMENT & PAYMENT

- A. No separate payment will be made for the work described herein. All work shall be part of the lump sum bid for this project.

++ END OF SECTION ++



APPENDIX 1

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering

Geotechnical Report

Westchester County DPW&T Backflow Preventer Facility & Water Supply Improvements at Westchester County Airport

Towns of Harrison and North Castle and
Village of Rye Brook, NY

October 23, 2020

Prepared for:

D&B Engineers and Architects, P.C.
4 West Red Oak Lane, Ste 315
White Plains, NY 10604

and

OLA Consulting Engineers, P.C.
50 Broadway
Hawthorne, NY 10532

Prepared by:

SKYLANDS ENGINEERING, LLC
124 Milton Road
Sparta, NJ 07871

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Prepared by:

SKYLANDS ENGINEERING, LLC
124 Milton Road
Sparta, NJ 07871
Certificate of Authorization No. 0043524



Eugene J. Schwarzrock, Professional Engineer
New York License No. 0770071

Date

10-23-2020

Note: It is a violation of N.Y. Education Law, Section 2209 for any person to alter any item in this report in any way, unless they are acting under the direction of a Professional Engineer registered in New York. The altering engineer shall affix to this page their seal, the notation "altered by" followed by their signature and date of alteration, and a specific description of the alteration(s) made.

TABLE OF CONTENTS

INTRODUCTION 1

GEOLOGY 1

SUBSURFACE INVESTIGATION 1

SUBSURFACE CONDITIONS 2

DESIGN RECOMMENDATIONS

WATER MAINS 3

METER/PRV VAULT 3

BACKFLOW PREVENTER BUILDINGS..... 4

CONSTRUCTION RECOMMENDATIONS 4

APPENDIX

- Boring Location Plans
- Boring Logs
- Rock Core Photo



INTRODUCTION

This project involves the construction of $\pm 5,200$ LF of new water mains, a new meter vault, and two (2) new backflow preventer buildings along portions of New King Street, Airport Road, and Airport Perimeter Road at the north end of Westchester County Airport, at the intersection of NYS Route 120 and Tower Road at the western perimeter of the airport in the Towns of Harrison and North Castle, and the Village of Harrison, Westchester County, New York.

The water lines will consist of 12 in. DIP and be installed with a nominal cover of 4 ft. below grade per the plans prepared by D&B Engineers and Architects. They will extend along New King Street from ± 200 ft. east of NYS Route 120 to Airport Road, and from just south of the Airport Maintenance driveway on Airport Road around the northern limit of the Airport and then along a portion of Airport Perimeter Road just north of runway 16/34. The new Meter/PRV Vault will be sized and designed by others, however is expected to be ± 13 ft. in diameter x 12 ft. deep. This vault will be constructed within the northwest quadrant of the intersection of New King Street and Airport Road. The Backflow Preventer and Meter (BFP) Buildings will be 12.5 ft. x 40 ft. x 10 ft. H and be constructed immediately south of the intersection of New King Street and Airport Road at the northern end of the airport, and ± 250 ft. northeast of the intersection of NYS Route 120 and Tower Road.

The terrain at the project sites is generally level to gently sloped, without significant grade changes. No significant cuts or fills are anticipated to install the proposed utilities or structures.

This report presents the findings of a subsurface investigation prepared and conducted by others specifically for this project, as well as geotechnical recommendations for design and construction of the proposed utilities and buildings.

GEOLOGY

Based on our review of topographic maps and published geologic data for the project area, including the *Surficial Geologic Map of New York - Lower Hudson Sheet*, 1989, by Caldwell, Connally, et. al., this site is expected to be underlain by glacial till consisting of a mixture of grain sizes ranging from clay and silt, to sand, cobbles and boulders. Significant Underlying bedrock is expected to be consist of schist, based on the *(Bedrock) Geologic Map of New York - Lower Hudson Sheet*, 1970, by Rickard, Isachsen, and Fisher.

SUBSURFACE INVESTIGATION

Soiltesting, Inc. of Oxford, CT performed eleven (11) borings between September 28 and October 1, 2020 to identify the subsurface conditions present beneath the proposed project limits. Borings B-1, B-2 and B-3 were performed along New King Street, B-4 and B-5 were located at the North Complex BFP Building, B-6 was performed along Airport Road ± 350 ft. north of the Airport Maintenance driveway, B-7 was located just west of the northwest corner of Airport Perimeter Road, and borings B-8 and B-9 were located near the proposed Tower Road BFP Building. In addition to these structure borings, two additional borings, B-8A and B-9A, were performed adjacent to borings B-8 and B-9 for environmental screening/sampling purposes.

All borings were drilled using a $3\frac{1}{4}$ in. or $4\frac{1}{4}$ in. diameter hollow stem auger to advance and maintain the hole. Soil sampling was performed using a 2 in. O.D. split spoon sampler driven by a 140 lb. automatic hammer with a 30 in. drop and the number of blows for each 6 in. increment was recorded, in



accordance with procedures outlined in ASTM D1586, Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils. The four (4) water line borings, B-1, B-2, B-6 and B-7, were sampled continuously to a depth of 6 ft., then a final sample was taken at a depth of 10 ft. The five (5) structure borings, B-3, B-4, B-5, B-8 and B-9, were sampled continuously to a depth of 12 ft., then at 5 ft. intervals to either the top of suspected bedrock or the bottom of the boring at a depth of ± 24.5 ft. to 31.5 ft. Bedrock were cored from boring B-5 using an N-size, double tube core barrel in accordance with ASTM D2113 - Standard Practice for Rock Core Drilling and Sampling.

Soil samples were classified by an experienced geologist from Soiltesting, generally in accordance with D.M. Burmister's "Suggested Test Methods for Identification of Soils" (ASTM, 1958). Bedrock samples were also classified by an experienced geologist from Soiltesting according to their rock type, origin, and measured percentage recovery and rock quality designation (RQD).

Groundwater was recorded when it was first encountered in each of the borings since the borings were performed without the introduction of water. Groundwater was also measured 6 days after completion of boring B-3, at the proposed Meter/PRV Vault, from an observation well installed in the boring after the completion of drilling.

Boring Location Plans and typed boring logs are presented in the Appendix. The boring logs were amended by Skylands Engineering to include surface and groundwater elevations.

SUBSURFACE CONDITIONS

The subsurface conditions encountered beneath this site are generally consistent with the published geologic literature. In general, brown, medium dense to very dense, medium to fine sand with significant minor percentages of coarse to fine gravel and trace silt were encountered from just beneath the topsoil to the top of weathered bedrock. Cobbles or boulders were encountered infrequently. Standard penetration test N-values ranged from 7 blows per foot (bpf) to 100+ bpf, with most N values >13. Note that these values are uncorrected N-values obtained using an automatic hammer. Such hammers typically have very high efficiencies and result in apparent lower N-values.

Of note, the loosest soils appeared clustered between the depths of 4 ft. and 10 ft. at borings B-3 and B-4, at the intersection of New King Street and Airport Road. The soils at these three (3) borings were also described as being possible fill, though otherwise similar to those described above, to a depth of 3.5 ft. to 6 ft. Similarly, the upper 4.5 ft. of soil at borings B-8 and B-9 was described as containing fill, however these fill soils also contained asphalt, and organic silt.

Weathered and/or unweathered bedrock was encountered in boring B-2 at a depth of 9 ft. (El. ± 398), B-3 at 15.5 ft. (El. ± 397.5), B-4 at 14.5 ft. (El. ± 397.5), B-5 at 16 ft. (El. ± 396). It is estimated that between 2.5 ft. and 10 ft. of weathered bedrock is present above unweathered bedrock, with N-values indicative of this material. The presence and depth of unweathered bedrock is presumed based on auger refusal and the results of a core sample taken at the bottom of boring B-5. This core had recovery percentage and RQD of 77% and 50%, indicative of fair quality bedrock.

Wet soils and the estimated groundwater table were encountered in borings B-3, B-4 and B-5 at the intersection of New King Street and Airport Road between the depths of 5 ft. and 10 ft. (El. 402 to El. 407). Further east groundwater was encountered at a depth of 7 ft. (El. 415) at boring B-6, and at the

Tower Road BFP groundwater was present at depths of 20 ft. and 22.5 ft. (El. 410 and 408.5). In the groundwater observation well set in boring B-3 at the intersection of New King Street and Airport Road groundwater was first encountered during drilling at a depth of 11 ft., then rose to a depth of 7.25 ft. (El. 405.75) within 6 days of relatively dry weather.

DESIGN RECOMMENDATIONS

WATER MAINS

Based on the findings of the above-described subsurface investigation program, and based on an assumed depth of installation of 5 ft. for the new water mains, it is expected that medium dense to dense sand and gravel will be encountered along the vast majority of the pipeline. Sporadic cobbles and boulders may also be encountered. Bedrock is not expected to be encountered along the proposed pipeline routes. Water should be expected to be present near the bottom of the excavation since multiple borings encountered groundwater at relatively shallow depth (<10 ft.).

METER/PRV VAULT

Based on our review of the soils present at the anticipated bottom of the Meter/PRV Vault (El. ± 401), we recommend a conventional mat/slab footing is suitable for support of the proposed vault. The soils present beneath the proposed vault are dense to very dense sands and gravel, with weathered bedrock expected within 3.5 ft. to 6 ft. of the vault bottom; however, groundwater is expected to be present at El. ± 406 , or ± 5 ft. above the bottom of the vault. In order to construct the vault under these conditions, it is recommended to remove 1 ft. of soil from beneath the vault and replace it with $\frac{3}{4}$ in. clean crushed stone so that this stone layer can protect the underlying sand while also acting as a permeable base from which sump pumps can be set installed to keep the excavation dry. Following placement of this stone layer, a modulus of subgrade reaction equal to 125 pci is recommended for design of the base slab. The following additional soil properties are suitable for design of the vault walls:

m-f Sand, some c-f Gravel (0 to ± 15.5 ft.)

Moist unit weight of soil, γ_t	= 120 pcf
Angle of internal friction, ϕ	= 32°
Lateral earth pressure coefficients:	
Active, K_a	= 0.31
Passive, K_p	= 3.25
At-rest, K_o	= 0.47
Coeff. of friction (sliding), $\tan \delta$	= 0.40 (steel on sand and gravel)

Given the soil classifications and relative densities recorded, it is estimated that post construction settlements will be negligible. Any settlement will also be elastic (instantaneous), with no long term consolidation settlement occurring.

Sheeting is expected to be required to support and maintain the surrounding ground and underground utilities. The soil properties listed above are also suitable for design of such sheeting.

In accordance with the provisions of Section 1613.3.2 of the Code, and ASCE 7 Chapter 20, a seismic site class of C – Very Dense Soil and Soft Rock is recommended for design, based on the conditions encountered during the investigation and assumed conditions to 100 ft. Based on the project location, in conjunction with the above site class, the following seismic parameters follow from the Code:



$S_s = 0.285$	$S_1 = 0.061$
$F_a = 1.3$	$F_v = 1.5$
$S_{MS} = 0.371$	$S_{M1} = 0.091$
$S_{DS} = 0.247$	$S_{D1} = 0.061$

Seismic Design Category = C (based on Risk Category IV)

The soils beneath the proposed Vault are expected to be non-liquefiable based on their gradation and suitably high relative density.

BACKFLOW PREVENTER BUILDINGS

The recommended frost depth and minimum footing depth for this area of New York is 42 in. below final exterior grade. Based on our review of the proposed construction, and the findings of the above-described subsurface investigation, spread footings are recommended for support of both the North Complex and Tower Road BFP Buildings. At the North Complex BFP Building, fill soils exist to a depth of 4 ft. to 6 ft. therefore this fill should be removed, the subgrade compacted, and $\frac{3}{4}$ in. crushed stone placed back up to frost depth. Following the above recommendations, an allowable bearing capacity of 1.5 tons per square foot (tsf) and a sliding coefficient of 0.45 may be used for design of the spread footings. Minimum footing widths of 20 in. for walls and 30 in. for isolated footings are recommended to limit differential settlements. It is estimated that the maximum post-construction settlement will be no more than $\frac{1}{2}$ in., with differential settlement estimated to be $\frac{1}{4}$ in. Settlement is expected to be elastic (instantaneous), with no long term consolidation settlement occurring.

At the Tower Road BFP Building, fill soils and organics exist to a depth of 4.5 ft. These materials should be removed, the subgrade compacted, and structural fill placed back up to frost depth. Following these recommendations, an allowable bearing capacity of 3 tons per square foot (tsf) and a sliding coefficient of 0.45 may be used for design of the spread footings. Minimum footing widths of 20 in. for walls and 30 in. for isolated footings are recommended to limit differential settlements. It is estimated that the maximum post-construction settlement will be no more than $\frac{1}{4}$ in., with differential settlement estimated to be $\frac{1}{8}$ in. Settlement is expected to be elastic (instantaneous), with no long term consolidation settlement occurring.

The soils beneath both proposed BFP Buildings are expected to be non-liquefiable based on their gradation and suitable relative density.

CONSTRUCTION RECOMMENDATIONS

Utilities, vaults and building footings shall not be constructed on frozen or saturated subgrade materials. All frozen or saturated subgrade soil should be removed and replaced with compacted structural fill, or clean crushed stone, as required.

All loosened soil present at the bottoms of excavations should be compacted using a trench compactor (ex. Rammax), jumping jack, or similar vibratory compactor. Such compaction should continue just until the required numbers of passes and all visible settlement is complete to prevent possible pumping of the subgrade during times of wet weather or shallow groundwater.

Since groundwater is typically highest in spring and the groundwater readings in this report were taken in September/October, groundwater in the northern portion of the project should be expected to be



present at relatively shallow depth (<10 ft.) during construction, and possibly above the water pipeline elevation. Should groundwater inflows be high, subgrade compaction pipe installation should be completed in quick succession within short segments (<20 ft.), rather than excavating longer portions of work which may soften prior to being fully prepared.

Any cobbles or boulders encountered during waterline, vault or footing construction should be removed so that no part protrudes into the bottom or sides of the excavations.

If organic soils are encountered they should be removed completely from the limits of the excavation or beneath the footings. Organic soils should not be used as structural backfill but may be used as general site fill, if allowed by project specifications.

All pipe backfill material, including bedding sand and common fill, should be as specified by the utility authority. Representative samples of any proposed fill material should be tested for gradation and moisture-density relationship prior to use to confirm its suitability. Backfill material should be placed and compacted in accordance with the utility authorities specifications, including percent compaction to be achieved. Unless otherwise stated, common backfill above the pipe should be placed in maximum 12 in. loose lifts and compacted to 92% of its maximum dry density at optimum moisture content as determined by the Modified Proctor Density Test (ASTM D1557). These operations should be performed under full-time geotechnical inspection and testing by either the Sand Cone Method (ASTM D1556), Nuclear Density Gauge (ASTM D2922 and D3012), or other moisture/density test methods. These density tests should be performed by an experienced geotechnical inspector at sufficient frequency and spacing to ensure proper compaction, with a minimum of 1 test each lift every 75-100 LF.

Most of the in situ soil should be suitable as common fill, provided it is kept near its optimum moisture content. Proper fill placement, grading and compaction techniques should be employed to prevent ponding and/or potential softening or pumping during periods of wet weather.

Soil structural fill should consist of predominately well-graded, coarse to fine sand and/or gravel with a maximum 10% non-plastic fines (material passing a No. 200 sieve) and be free of organics and other deleterious materials. Aggregate size should be limited to no bigger than 1 in. in the largest dimension. It is estimated that >50% of the in situ soils may be suitable for reuse as structural fill, based on the estimated classifications. Representative samples of any proposed fill material should be tested for gradation and moisture-density relationship prior to use to confirm its suitability.

Structural fill for buildings should be placed in maximum 12 in. loose lifts and compacted to 95% of its maximum dry density at optimum moisture content as determined by the Modified Proctor Density Test (ASTM D1557). These operations should be performed under full-time geotechnical inspection and testing by either the Sand Cone Method (ASTM D1556), Nuclear Density Gauge (ASTM D2922 and D3012), or other moisture/density test methods. These density tests should be performed by an experienced geotechnical inspector at sufficient frequency to ensure proper compaction.

For excavations that extend deeper than 5 ft., sheeting, shoring, sloping, or benching of the excavation sidewalls is required per OSHA standards. While an OSHA-competent person has to confirm and assign soil type(s) during construction, for estimating purposes the soils present on site may be assumed to be Type C and therefore would need to be sloped back at a 1.5H:1V (34°), per OSHA requirements. For the

design of any temporary shoring, the following soil parameters are recommended for use throughout the project limits:

m-f Sand with Gravel above bedrock

Moist unit weight of soil, $\gamma_t = 120$ pcf

Angle of internal friction, $\phi = 34^\circ$

Lateral earth pressure coefficients:

Active, $K_a = 0.28$

Passive, $K_p = 3.54$

At-rest, $K_o = 0.44$

All sheeting, shoring and bracing shall be designed by a professional engineer licensed in the State of New York.

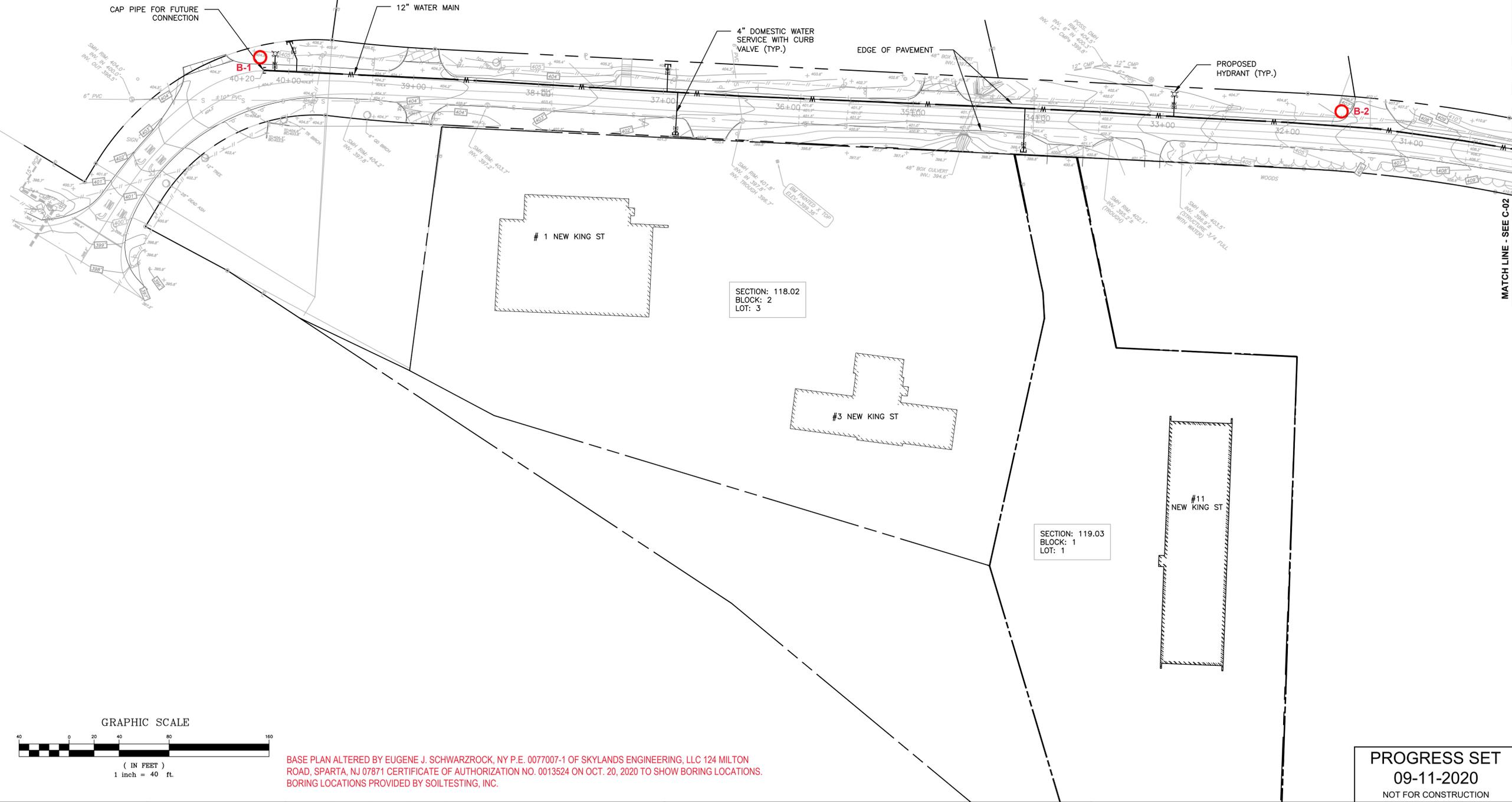
It is recommended that all foundation construction and subgrade preparation procedures be inspected by a qualified geotechnical engineer experienced with this type of construction.

APPENDIX



#4 NEW KING ST
SECTION: 118.02
BLOCK: 2
LOT: 1

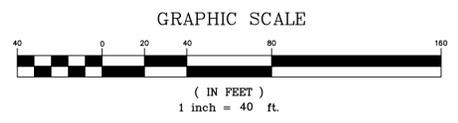
#10 NEW KING ST
SECTION: 118.02
BLOCK: 2
LOT: 2



MATCH LINE - SEE C-02

SECTION: 118.02
BLOCK: 2
LOT: 3

SECTION: 119.03
BLOCK: 1
LOT: 1



BASE PLAN ALTERED BY EUGENE J. SCHWARZROCK, NY P.E. 0077007-1 OF SKYLANDS ENGINEERING, LLC 124 MILTON ROAD, SPARTA, NJ 07871 CERTIFICATE OF AUTHORIZATION NO. 0013524 ON OCT. 20, 2020 TO SHOW BORING LOCATIONS. BORING LOCATIONS PROVIDED BY SOILTESTING, INC.

PROGRESS SET
09-11-2020
NOT FOR CONSTRUCTION

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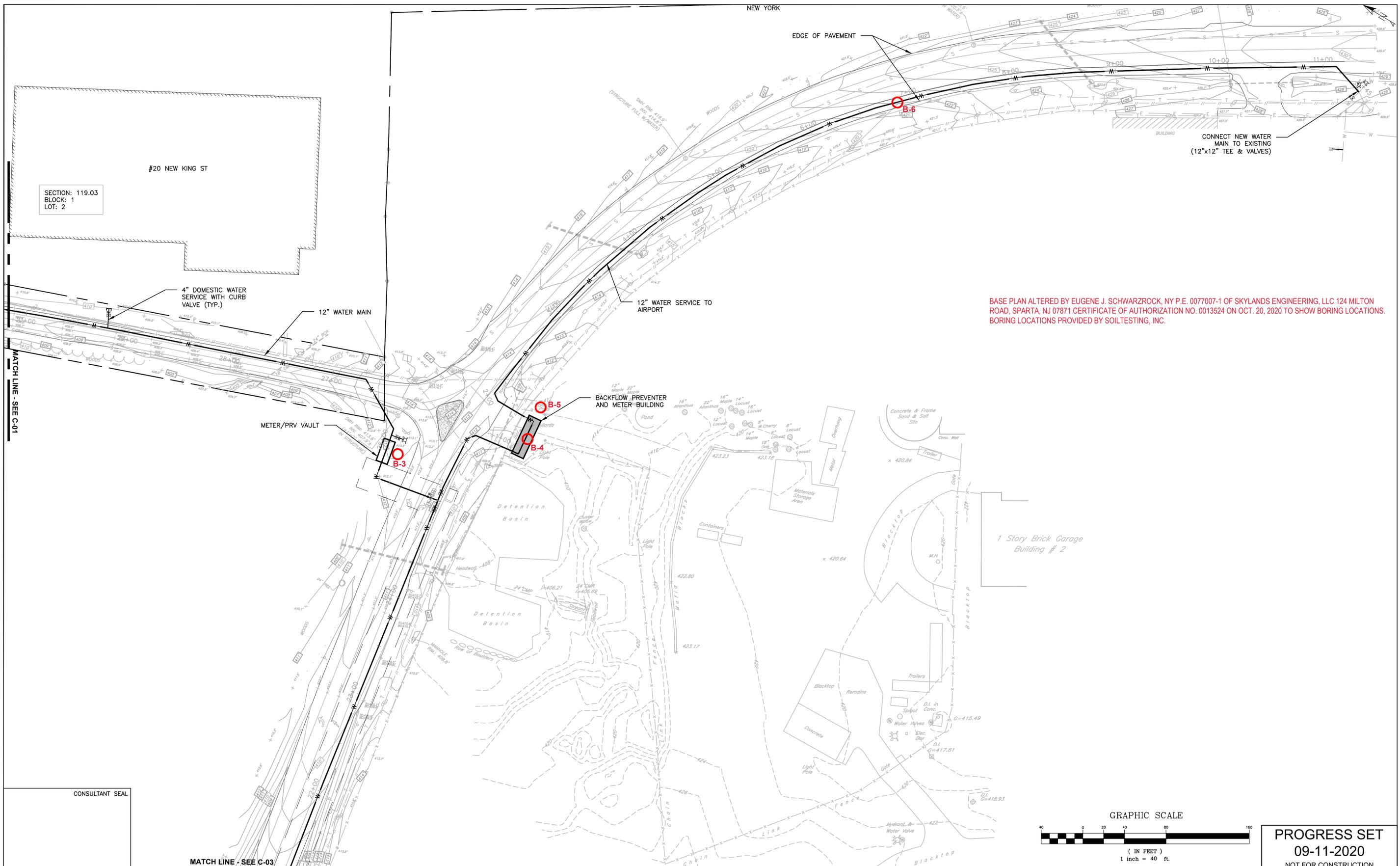
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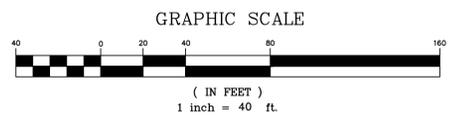
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CONTRACTOR		PROJECT COORDINATOR	
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SIGNATURE _____	SIGNATURE _____	SIGNATURE _____	SIGNATURE _____
TITLE _____	TITLE _____	TITLE _____	TITLE _____
DATE _____	DATE _____	DATE _____	DATE _____

WESTCHESTER COUNTY, NEW YORK
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
DIVISION OF ENGINEERING
BACKFLOW PREVENTER FACILITY & WATER SUPPLY IMPROVEMENTS
AT WESTCHESTER COUNTY AIRPORT - PROJECT NO. 1
TOWNS OF HARRISON, NORTH CASTLE & VILLAGE OF RYE BROOK
WATER MAIN PLAN NO. 1

CONTRACT NUMBER 19-925	SHEET NUMBER C-01
SCALE: AS SHOWN DATE: ##-##-2020	
DPW FILE NO. _____	REV. NO. _____



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PROGRESS SET
09-11-2020
NOT FOR CONSTRUCTION

CONSULTANT SEAL

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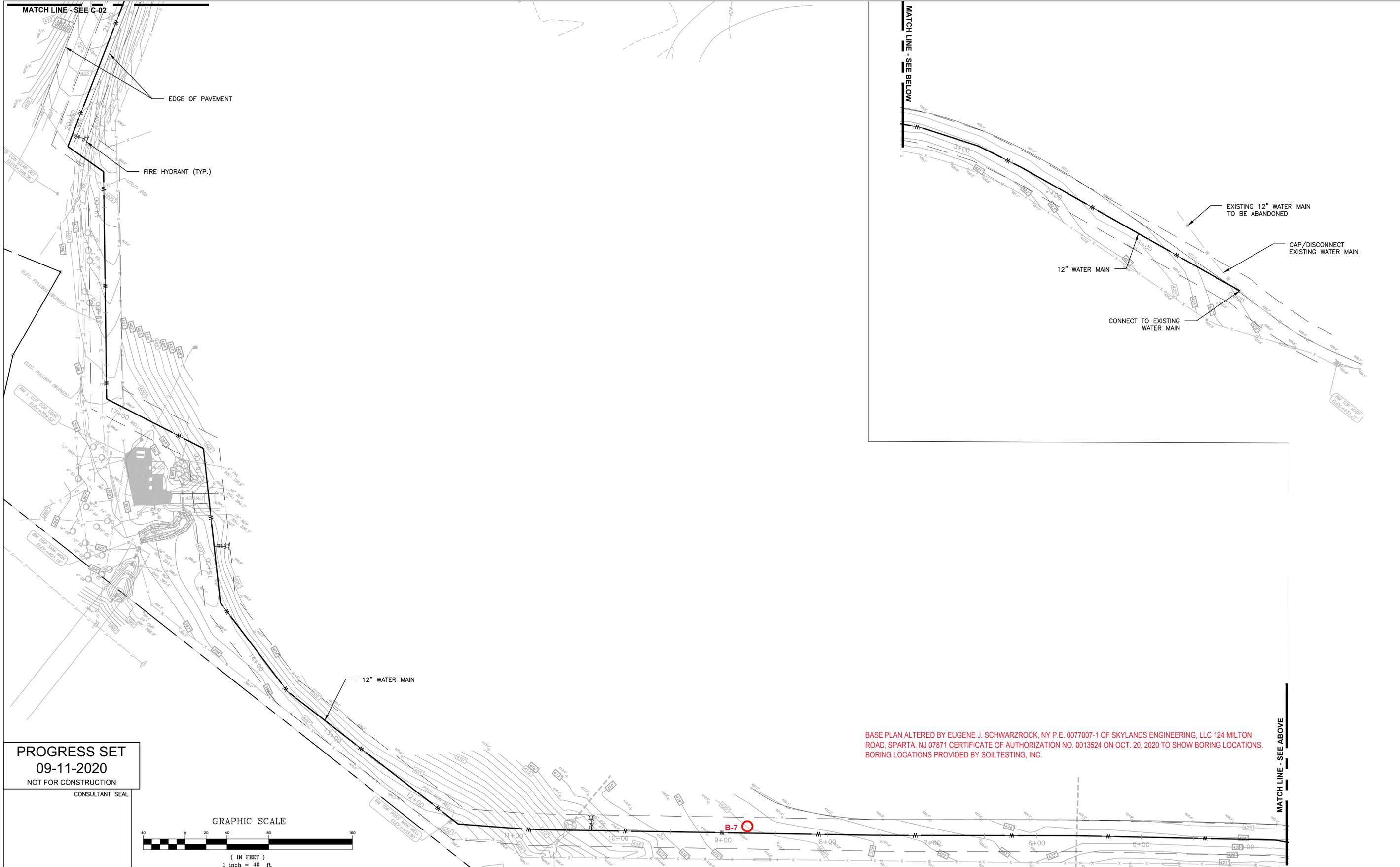
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CONTRACTOR		PROJECT COORDINATOR	
NAME _____	NAME _____	NAME _____	NAME _____
SIGNATURE _____	SIGNATURE _____	SIGNATURE _____	SIGNATURE _____
TITLE _____	TITLE _____	TITLE _____	TITLE _____
DATE _____	DATE _____	DATE _____	DATE _____

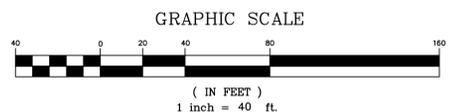
WESTCHESTER COUNTY, NEW YORK
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
DIVISION OF ENGINEERING
BACKFLOW PREVENTER FACILITY & WATER SUPPLY IMPROVEMENTS
AT WESTCHESTER COUNTY AIRPORT - PROJECT NO. 1
TOWNS OF HARRISON, NORTH CASTLE & VILLAGE OF RYE BROOK
WATER MAIN PLAN NO. 2

CONTRACT NUMBER 19-925	SHEET NUMBER C-02
SHEET NO. OF	
SCALE: AS SHOWN DATE: ##-##-2020	
DPW FILE NO.	REV. NO.



BASE PLAN ALTERED BY EUGENE J. SCHWARZROCK, NY P.E. 0077007-1 OF SKYLANDS ENGINEERING, LLC 124 MILTON ROAD, SPARTA, NJ 07871 CERTIFICATE OF AUTHORIZATION NO. 0013524 ON OCT. 20, 2020 TO SHOW BORING LOCATIONS. BORING LOCATIONS PROVIDED BY SOILTESTING, INC.

PROGRESS SET
09-11-2020
NOT FOR CONSTRUCTION



OLA Consulting Engineers
50 Broadway,
Hawthorne, NY 10532
914.747.2600
8 West 36th Street,
Suite 501
New York, NY 10018
646.849.4110
olace.com

D&B ENGINEERS AND ARCHITECTS, P.C.
4 WEST 183D OAK LANE,
10504
WHITE PLAINS, NY
(914)467-5300

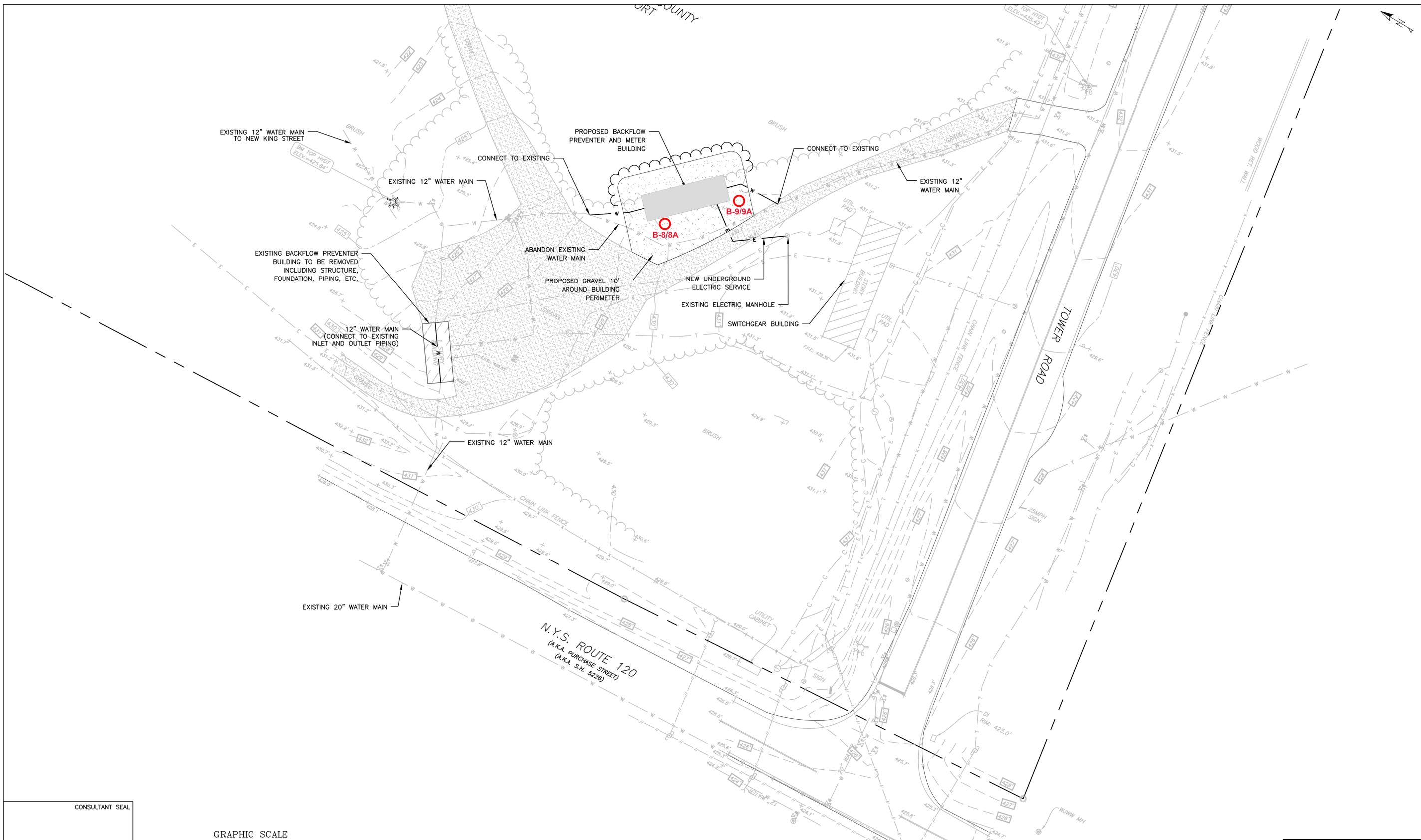
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REVISION NUMBER	DATE	MADE BY	APP'D BY	REVISION

RECORD DRAWING CERTIFICATION			
<input type="checkbox"/> AS BUILT - CHANGES AS NOTED		<input type="checkbox"/> AS BUILT - NO CHANGES	
CONTRACTOR		PROJECT COORDINATOR	
NAME _____	NAME _____	NAME _____	NAME _____
SIGNATURE _____	SIGNATURE _____	SIGNATURE _____	SIGNATURE _____
TITLE _____	TITLE _____	TITLE _____	TITLE _____

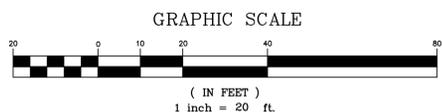
WESTCHESTER COUNTY, NEW YORK
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
DIVISION OF ENGINEERING
BACKFLOW PREVENTER FACILITY & WATER SUPPLY IMPROVEMENTS
AT WESTCHESTER COUNTY AIRPORT - PROJECT NO. 1
TOWNS OF HARRISON, NORTH CASTLE & VILLAGE OF RYE BROOK
WATER MAIN PLAN NO. 3

CONTRACT NUMBER 19-925	SHEET NUMBER C-03
SHEET NO. OF	
SCALE: AS SHOWN	
DATE: ##-##-2020	
DPW FILE NO.	REV. NO.



BASE PLAN ALTERED BY EUGENE J. SCHWARZROCK, NY P.E. 0077007-1 OF SKYLANDS ENGINEERING, LLC 124 MILTON ROAD, SPARTA, NJ 07871 CERTIFICATE OF AUTHORIZATION NO. 0013524 ON OCT. 20, 2020 TO SHOW BORING LOCATIONS. BORING LOCATIONS PROVIDED BY SOILTESTING, INC.

PROGRESS SET
09-11-2020
NOT FOR CONSTRUCTION



CONSULTANT SEAL

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RECORD DRAWING CERTIFICATION			
<input type="checkbox"/> AS BUILT - CHANGES AS NOTED		<input type="checkbox"/> AS BUILT - NO CHANGES	
CONTRACTOR		PROJECT COORDINATOR	
NAME _____	NAME _____	NAME _____	NAME _____
SIGNATURE _____	SIGNATURE _____	SIGNATURE _____	SIGNATURE _____
TITLE _____	TITLE _____	TITLE _____	TITLE _____
DATE _____	DATE _____	DATE _____	DATE _____

WESTCHESTER COUNTY, NEW YORK
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
DIVISION OF ENGINEERING
BACKFLOW PREVENTER FACILITY & WATER SUPPLY IMPROVEMENTS
AT WESTCHESTER COUNTY AIRPORT - PROJECT NO. 1
TOWNS OF HARRISON, NORTH CASTLE & VILLAGE OF RYE BROOK
WATER MAIN PLAN NO. 4

CONTRACT NUMBER 19-925	SHEET NUMBER C-04
SHEET NO. OF	
SCALE: AS SHOWN	
DATE: ##-##-2020	
DPW FILE NO.	REV. NO.

Boring Logs

SOILTESTING, INC. 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: D&B Engineers & Arch	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. G155-1608-20	HOLE NO. B-1
	PROJECT NAME Westchester County Airport	BORING LOCATIONS per Plan
FOREMAN - DRILLER MK/ao	LOCATION Harrison NY	
INSPECTOR	CASING TYPE HSA	OFFSET
GROUND WATER OBSERVATIONS AT <u>none</u> FT AFTER <u>0</u> HOURS AT <u> </u> FT AFTER <u> </u> HOURS	SAMPLER SS*	DATE START 9/29/20
	SIZE I.D. 3 3/4"	DATE FINISH 9/29/20
	HAMMER WT. 140#	SURFACE ELEV. El. ±404.5
	HAMMER FALL 30"	GROUND WATER ELEV.

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)		CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		NO	Type	PEN	REC	DEPTH @ BOT	0 - 6	6 - 12				
5		1	ss	24"	20"	2'0"	4	14		dry compact dry v dense dry v dense	10'7"	Brn FM SAND, sm FC gravel
		2	ss	24"	18"	4'0"	54	62				SAME
		3	ss	24"	16"	6'0"	28	38				Brn FM SAND, sm FC gravel, tr silt
10		4	ss	7"	0"	10'7"	24	50/1"		dry	10'7"	SAME; sm boulders
15												E.O.B 10'7"
20												
25												
30												
35												
40												* CME AUTOHAMMER

NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT.	HOLE NO. B-1
A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST	
WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS	C = COARSE
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER	M = MEDIUM
PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50%	F = FINE

SOILTESTING, INC. 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: D&B Engineers & Arch	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. G155-1608-20	HOLE NO. B-2
	PROJECT NAME Westchester County Airport	BORING LOCATIONS per Plan
FOREMAN - DRILLER MK/ao	LOCATION Harrison NY	
INSPECTOR	CASING TYPE HSA	OFFSET
GROUND WATER OBSERVATIONS AT <u>none</u> FT AFTER <u>0</u> HOURS AT <u> </u> FT AFTER <u> </u> HOURS	SAMPLER SS*	DATE START 9/29/20
	SIZE I.D. 3 1/4"	DATE FINISH 9/29/20
	HAMMER WT. 140#	SURFACE ELEV. EI. ±407
	HAMMER FALL 30"	GROUND WATER ELEV.

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)		CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.	
		NO	Type	PEN	REC	DEPTH @ BOT	0 - 6	6 - 12					12 - 18
5		1	ss	24"	16"	2'0"	2	2		dry loose dry dense dry dense	9'0"	6" Topsoil; Brn FM SAND, sm silt, lit FC gravel	
		2	ss	24"	16"	4'0"	5	8				Brn FMC SAND, sm FC gravel, tr silt	
		3	ss	24"	18"	6'0"	34	28				SAME	
							15	18					
10		4	ss	7"	6"	10'6"	62	50/1"		dry	10'6"	partly decomposed BEDROCK or boulders	
												E.O.B 10'6"	
15													
20													
25													
30													
35													
40												* CME AUTOHAMMER	

NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT.	HOLE NO. B-2
A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST	
WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS	C = COARSE
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER	M = MEDIUM
PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50%	F = FINE

SOILTESTING, INC. 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: D&B Engineers & Arch	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. G155-1608-20	HOLE NO. B-3
	PROJECT NAME Westchester County Airport	BORING LOCATIONS per Plan
FOREMAN - DRILLER MK/ao	LOCATION Harrison NY	
INSPECTOR	CASING TYPE HSA	SAMPLER SS*
GROUND WATER OBSERVATIONS AT <u>11'</u> FT AFTER <u>0</u> HOURS AT <u>7'3"</u> FT <u>10/7/2020</u>	SIZE I.D. 3 1/4"	CORE BAR 1 3/8"
	HAMMER WT. 140#	BIT
	HAMMER FALL 30"	
		OFFSET
		DATE START 9/29/20
		DATE FINISH 10/1/20
		SURFACE ELEV. EI. ±413
		GROUND WATER ELEV. EI. ±405.75

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)			CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		NO	Type	PEN	REC	DEPTH @ BOT	0 - 6	6 - 12	12 - 18				
5	1	ss	24"	20"	2'0"	4	16			dry		4" Topsoil; Brn FMC SAND & FC GRAVEL, tr silt (possible fill)	
						40	29			v dense			
	2	ss	24"	18"	4'0"	28	22			dry		SAME	
						14	14			dense			
10	3	ss	24"	18"	6'0"	14	10			dry		SAME	
						10	6			compact			
	4	ss	24"	14"	8'0"	3	4			dry		Brn FM SAND, sm FC gravel, tr silt	
						4	6			loose			
15	5	ss	24"	14"	10'0"	12	14			moist		SAME	
						9	10			compact			
	6	ss	24"	18"	12'0"	3	6			wet		GreyBrn F SAND, sm silt, lit FC gravel	
						11	11			compact			
20													
	7	ss	18"	14"	16'6"	6	10			wet	15'6"		
						24				dense		partly decomposed BEDROCK or boulders	
											18'0"		
25													
	8	ss	2"	1"	20'2"	50'2"				wet		partly decomposed BEDROCK	
30													
	9	ss	4"	4"	25'4"	50'3"				wet		SAME	
35													
	10	ss	3"	3"	30'3"	50'3"				v dense	30'3"	SAME	
40													

NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT.	HOLE NO. B-3
A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST	
WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS	C = COARSE
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER	M = MEDIUM
PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50%	F = FINE

SOILTESTING, INC. 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: D&B Engineers & Arch	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. G155-1608-20	HOLE NO. B-4
	PROJECT NAME Westchester County Airport	BORING LOCATIONS per Plan
FOREMAN - DRILLER MK/ao	LOCATION Harrison NY	
INSPECTOR	CASING SAMPLER CORE BAR	OFFSET
GROUND WATER OBSERVATIONS AT <u>10</u> FT AFTER <u>0</u> HOURS	TYPE HSA SS*	DATE START 9/29/20
AT <u> </u> FT AFTER <u> </u> HOURS	SIZE I.D. 3 1/4" 1 3/8"	DATE FINISH 9/30/20
	HAMMER WT. 140# BIT	SURFACE ELEV. EI. ±412
	HAMMER FALL 30"	GROUND WATER ELEV. EI. ±402

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)		CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		NO	Type	PEN	REC	DEPTH @ BOT	0 - 6	6 - 12				
5		1	ss	24"	18"	2'0"	9	15		dry	4'0"	Brn F SAND & FC GRAVEL
						14	17		compact	SAME (possible fill)		
		2	ss	24"	20"	4'0"	10	18			dry	Brn F SAND & SILT, lit FC gravel
						21	10		dense			
		3	ss	24"	14"	6'0"	3	3		moist		
10						4	8		loose	14'6"	Brn FMC SAND, sm FC gravel, tr silt	
		4	ss	24"	20"	8'0"	11	10				dry
						12	14		compact	17'0"	SAME	
		5	ss	24"	16"	10'0"	5	7				dry
						4	7		compact			
15		6	ss	24"	18"	12'0"	10	11		compact	17'0"	Brn FMC SAND & FC GRAVEL, tr silt
						14	17		wet			
									compact	17'0"	White FMC SAND & FC GRAVEL, tr cobbles (possible partly decomposed BEDROCK)	
		7	ss	18"	16"	16'6"	43	44				dry
							41					v dense
20										24'6"	partly decomposed BEDROCK	
		8	ss	2"	2"	20'2"	50'2"					v dense
											Auger refusal	
25											E.O.B 24'6"	
30											* CME AUTOHAMMER	
35											* CME AUTOHAMMER	
40											* CME AUTOHAMMER	

NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT.	HOLE NO. B-4
A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST	
WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS	C = COARSE
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER	M = MEDIUM
PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50%	F = FINE

SOILTESTING, INC. 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: D&B Engineers & Arch	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. G155-1608-20	HOLE NO. B-5
	PROJECT NAME Westchester County Airport	BORING LOCATIONS per Plan
FOREMAN - DRILLER MK/ao	LOCATION Harrison NY	
INSPECTOR	CASING HSA	SAMPLER SS*
	TYPE	CORE BAR NQ2
GROUND WATER OBSERVATIONS	SIZE I.D.	DATE START 9/29/20
AT <u>5</u> ' FT AFTER <u>0</u> HOURS	HAMMER WT.	DATE FINISH 9/30/20
AT <u> </u> ' FT AFTER <u> </u> HOURS	HAMMER FALL	SURFACE ELEV. EI. ±412
		GROUND WATER ELEV. EI. ±407

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)			CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		NO	Type	PEN	REC	DEPTH @ BOT	0 - 6	6 - 12	12 - 18				
5		1	ss	24"	18"	2'0"	6	4				3'6"	Brn FMC SAND, sm FC gravel (possible fill)
		2	ss	24"	18"	4'0"	5	6					loose
		3	ss	24"	16"	6'0"	2	3				loose	SAME
		4	ss	24"	14"	8'0"	5	8				compact	Brn FM SAND & SILT, lit FC gravel
		5	ss	24"	14"	10'0"	14	15				wet	Brn FMC SAND, sm FC gravel, tr silt
10		6	ss	24"	16"	12'0"	12	10				compact	SAME
						10	11				wet	Brn FMC SAND, sm silt, lit FC gravel	
						10	14				compact		
15		7	ss	14"	12"	16'2"	9	12				wet	16'0" Brn FMC SAND, sm silt, lit FC gravel
						50/2"							partly decomposed BEDROCK
20		8	ss	2"	2"	20'2"	50/2"					wet	SAME
25		9	ss	1"	0"	25'1"	50/1"					wet	26'0" No recovery Auger refusal
		1	C	60"	46"	31'0"	RQD= 50%	3					
30							Rec. = 77%	4					BEDROCK (GRANITE)
								3					
								4					
35								3				31'0"	
													E.O.B 31'0"
40													* CME AUTOHAMMER

NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT.	HOLE NO. B-5
A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST	
WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS	C = COARSE
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER	M = MEDIUM
PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50%	F = FINE

SOILTESTING, INC. 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: D&B Engineers & Arch	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. G155-1608-20	HOLE NO. B-6
	PROJECT NAME Westchester County Airport	BORING LOCATIONS per Plan
FOREMAN - DRILLER MK/ao	LOCATION Harrison NY	
INSPECTOR	CASING TYPE HSA	SAMPLER SS*
GROUND WATER OBSERVATIONS AT <u>7</u> FT AFTER <u>0</u> HOURS	SIZE I.D. 3 1/4"	1 3/8"
AT <u> </u> FT AFTER <u> </u> HOURS	HAMMER WT. 140#	BIT
	HAMMER FALL 30"	CORE BAR
		OFFSET
		DATE START 9/29/20
		DATE FINISH 9/29/20
		SURFACE ELEV. EI. ±422
		GROUND WATER ELEV. EI. ±415

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)		CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.	
		NO	Type	PEN	REC	DEPTH @ BOT	0 - 6	6 - 12					12 - 18
5		1	ss	24"	20"	2'0"	3	5		dry		6" Topsoil; Brn FM SAND, sm FC gravel, tr silt	
							13	11		compact			
			2	ss	24"	22"	4'0"	8	12		dry	2'6"	SAME
								12	12		compact		
10							9	10		moist		OliveBrn F SAND, sm silt, lit FC gravel	
							10	7		compact		GreyBrn F SAND, sm silt, lit FC gravel	
15													
			4	ss	18"	14"	11'6"	16	15		wet dense	11'6"	Brn FMC SAND, sm silt, lit FC gravel
							21						
20													
25													
30													
35													
40													

E.O.B 11'6"

* CME AUTOHAMMER

NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT.	HOLE NO. B-6
A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST	
WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS	C = COARSE
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER	M = MEDIUM
PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50%	F = FINE

SOILTESTING, INC. 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: D&B Engineers & Arch	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. G155-1608-20	HOLE NO. B-7
	PROJECT NAME Westchester County Airport	BORING LOCATIONS per Plan
FOREMAN - DRILLER MK/ao	LOCATION Harrison NY	
INSPECTOR	CASING TYPE HSA	SAMPLER SS*
GROUND WATER OBSERVATIONS AT <u>none</u> FT AFTER <u>0</u> HOURS AT <u> </u> FT AFTER <u> </u> HOURS	SIZE I.D. 3 3/4"	CORE BAR 1 3/8"
	HAMMER WT. 140#	BIT 30"
	HAMMER FALL	
		OFFSET
		DATE START 9/29/20
		DATE FINISH 9/29/20
		SURFACE ELEV. EI. ±420
		GROUND WATER ELEV.

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)			CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		NO	Type	PEN	REC	DEPTH @ BOT	0 - 6	6 - 12	12 - 18				
5		1	ss	24"	18"	2'0"	6	19		dry dense dry v dense dry compact		6" Topsoil; Brn FM SAND, sm FC gravel, tr silt SAME Brn FM SAND & FC GRAVEL	
		2	ss	24"	18"	4'0"	36	87					
		3	ss	24"	20"	6'0"	7	9					
							13	12					
10		4	ss	18"	14"	11'6"	9	13		moist compact	11'6"	Brn FM SAND, sm F gravel, tr silt cobbles	
							10	10					
15												E.O.B 11'6"	
20													
25													
30													
35													
40													

NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT. **HOLE NO. B-7**

A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
 WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS C = COARSE
 SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER M = MEDIUM
 PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% F = FINE

SOILTESTING, INC. 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: D&B Engineers & Arch	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. G155-1608-20	HOLE NO. B-8
	PROJECT NAME Westchester County Airport	BORING LOCATIONS per Plan
FOREMAN - DRILLER JK/ao	LOCATION Harrison NY	
INSPECTOR JD	CASING TYPE HSA	SAMPLER SS*
GROUND WATER OBSERVATIONS AT <u>20</u> FT AFTER <u>0</u> HOURS	SIZE I.D. 4 1/4"	CORE BAR 1 3/8"
AT <u> </u> FT AFTER <u> </u> HOURS	HAMMER WT. 140#	BIT 30"
	HAMMER FALL 30"	OFFSET
		DATE START 9/28/20
		DATE FINISH 9/28/20
		SURFACE ELEV. EI. ±430
		GROUND WATER ELEV. EI. ±410

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)			CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		NO	Type	PEN	REC	DEPTH @ BOT	0 - 6	6 - 12	12 - 18				
5		1	ss	24"	20"	2'0"	4	10			dry		Brn FMC SAND, sm asphalt frags, lit gravel (fill)
		2	ss	24"	20"	4'0"	24	27			dense	2'6"	
							22	31			dry	4'0"	Grey FC GRAVEL, lit FMC sand, cobbles, boulders (possible fill)
		3	ss	24"	24"	6'0"	15	25			dense	4'6"	DkBrn FM SAND, lit organic SILT, F gravel
10							27	22			dry/moist		
		4	ss	23"	23"	7'11"	17	21			v dense		
							19	50/5"			dry/moist		GreyBrn FM SAND, lit silt
		5	ss	24"	24"	10'0"	8	14			dense		boulders 7'6"-8'
15							15	28			dry/moist		
		6	ss	24"	21"	12'0"	18	32			compact		SAME; tr C sand
							32	30			moist		
											v dense		
20													
		7	ss	24"	24"	17'0"	17	20			dry/moist		Grey F SAND, sm silt, tr C sand, F gravel
							30	28			dense		
25		8	ss	18"	18"	21'6"	15	27			moist		Brn F SAND, lit silt, tr C sand, F gravel
							31			v dense			lit cobbles @ 22' & 23'
30		9	ss	18"	18"	26'6"	18	41			wet		SAME, Grey
							40			v dense			
35		10	ss	18"		31'6"	22	35			wet		SAME, Grey
							38			v dense	31'6"		
40													

NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT.	HOLE NO. B-8
A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST	
WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS	C = COARSE
SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER	M = MEDIUM
PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50%	F = FINE

SOILTESTING, INC. 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: D&B Engineers & Arch	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. G155-1608-20	HOLE NO. B-9
	PROJECT NAME Westchester County Airport	BORING LOCATIONS per Plan
FOREMAN - DRILLER JK/ao	LOCATION Harrison NY	
INSPECTOR	CASING TYPE HSA	SAMPLER SS*
GROUND WATER OBSERVATIONS AT <u>22</u> ' FT AFTER <u>0</u> HOURS AT <u> </u> ' FT AFTER <u> </u> HOURS	SIZE I.D. 3 1/4"	CORE BAR 1 3/8"
	HAMMER WT. 140#	BIT 30"
	HAMMER FALL	
		OFFSET
		DATE START 9/28/20
		DATE FINISH 9/28/20
		SURFACE ELEV. EI. ±431
		GROUND WATER ELEV. EI. ±408.5

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)			CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		NO	Type	PEN	REC	DEPTH @ BOT	0-6	6-12	12-18				
5		1	ss	24"	10"	2'0"	2	8			dry		Brn FMC SAND, sm asphalt, lit F gravel (fill)
		2	ss	9"	3"	2'9"	8	50/1"			compact dry		Brn FMC SAND & ASPHALT, cobbles (fill)
		3	ss	24"	18"	6'0"	17	24			dry	4'6"	cobbles 2-4'6"
							16	16			dense		Brn FMC SAND & F GRAVEL
		4	ss	24"	22"	8'0"	31	33			dry		Brn FM SAND, lit silt, lit F gravel
10						24	21			v dense			
		5	ss	24"	22"	10'0"	9	10			moist		Grey F SAND, sm silt
							12	20			compact		
15							21	54			moist		Brn FM SAND, sm silt, lit boulders
						50/2"				v dense			
		7	ss	18"	18"	16'6"	12	14			moist		Grey FM SAND, sm silt, tr C sand, tr F gravel
							19				dense		
20													
		8	ss	18"	18"	21'6"	24	20			moist		GreyBrn F SAND, sm silt, lit C sand, tr F gravel
							14			dense			
25													
		9	s	18"	16"	26'6"	24	32			wet		SAME
							38			v dense			
30													
		10	ss	18"	14"	31'6"	23	41			wet		SAME
							48			v dense	31'6"		
35													E.O.B 31'6"
													* CME AUTOHAMMER
40													

NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT. **HOLE NO. B-9**

A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
 WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS C = COARSE
 SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER M = MEDIUM
 PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% F = FINE

SOILTESTING, INC. 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: D&B Engineers & Arch	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. G155-1608-20	HOLE NO. B-8A / B-9A
	PROJECT NAME Westchester County Airport	BORING LOCATIONS per Plan
FOREMAN - DRILLER MK/ao	LOCATION Harrison NY	
INSPECTOR	CASING TYPE HSA	OFFSET
	SAMPLER SS*	DATE START 9/29/20
GROUND WATER OBSERVATIONS	SIZE I.D. 3 3/4"	DATE FINISH 9/29/20
AT <u>none</u> FT AFTER <u>0</u> HOURS	HAMMER WT. 140#	SURFACE ELEV. EI. ±430
AT <u> </u> FT AFTER <u> </u> HOURS	HAMMER FALL 30"	GROUND WATER ELEV.

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)		CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		NO	Type	PEN	REC	DEPTH @ BOT	0 - 6	6 - 12		MOIST	ELEV	
5	B-8A	1	ss	24"	18"	2'0"	5	7		dry		3" Topsoil; BlkBrn FM SAND, sm FC gravel, tr asphalt (fill) Brn FM SAND & FC GRAVEL (fill)
		2	ss	24"	20"	4'0"	12	28		compact dry		
							38	31		v dense	4'0"	
10												E.O.B. 4'0"
15												E.O.B. 4'0"
GROUND WATER OBSERVATIONS												E.I. ±431
AT <u>none</u> FT AFTER <u>0</u> HOURS												
AT <u> </u> FT AFTER <u> </u> HOURS												
5	B-9A	1	ss	24"	20"	2'0"	8	22		dry		BlkBrn FM SAND, sm F gravel, tr asphalt (fill) Brn FM SAND, sm FC gravel (fill)
		2	ss	24"	14"	4'0"	21	21		dense dry		
							68	31		v dense	4'0"	
10												E.O.B. 4'0"
15												E.O.B. 4'0"
20												* CME AUTOHAMMER

NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT. **HOLE NO. B-8A / B-9A**

A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
 WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS C = COARSE
 SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER M = MEDIUM
 PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% F = FINE

Rock Core Photo



Rock Core - B-5 C-1 26-31 ft.



APPENDIX 2

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering



October 07, 2020

Mr. James DeAngelis
Soiltesting, Inc.
90 Donovan Road
Oxford, Connecticut 06478

**Re: Soil Sample Collection & Laboratory Analysis
Westchester County Air Port, Harrison, New York**

Dear Mr. DeAngelis,

Berkshire Environmental Services & Technology, LLC (Berkshire) was retained by Soiltesting, Inc. to collect soil samples and subsequently submit the samples for laboratory analysis from soil borings advanced at the above-referenced Site by Soiltesting, Inc. A total of nine soil borings were advanced at select locations in the vicinity of the Westchester County Airport, in Harrison, New York (the Site) on September 29, 2020 for the purpose of characterizing subsurface conditions. The field activities were conducted in accordance with the Request for Proposal and your email dated September 3, 2020.

Nine (9) soil borings (B-1 through B-9) were advanced on the Site. Soil borings were conducted utilizing an all-terrain vehicle-mounted drill rig. Split spoon samples were collected continuously at 2-foot intervals to a maximum depth of up to ten (10) feet below grade. Each split spoon soil sample was field screened with a photoionization detector (PID) for the presence of volatile organic compounds. No PID responses were recorded in any of the soil samples.

At each boring location, one grab sample was collected. An additional grab sample was also collected from boring B-3. Three composite soil samples were collected in accordance with your RFP. One composite sample included soil composited from borings B-1, B-2, B-6 and B-7. The Second composite sample was collected from soil composited from borings B-3, B-4 and B-5. The third composite sample was collected from soil composited from borings B-8 and B-9.

Soil samples were submitted for laboratory analysis to Phoenix Environmental Laboratories, Inc. (Phoenix) of Manchester, Connecticut under proper chain of custody protocol. Phoenix is a New York-certified laboratory (NY Lab Id No: 11301). Grab soil samples were submitted from discrete intervals based on field observations and submitted for analysis of VOCs via EPA Method 8260. The three composite samples were submitted for analysis of semi-volatile organic compounds (SVOCs) via EPA method 8270, pesticides via EPA Method 8081, herbicides via EPA method 8151, PCBs via EPA method 8082, TPH, cyanide, pH, reactivity cyanide and sulfide, flash point, full TCLP and TAL metals including Ag, Al, As, Ba, Be, Ca, Cd, Co Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Tl, V and Zn. via total analysis.

Samples submitted for analysis of VOCs were selected based on visual observations of the soil collected and the results of field-screening for VOCs with a photoionization detector (PID). Soil samples submitted

for VOC analysis were discrete grab samples collected with disposable core samplers and weighed. The samples were subsequently placed into pre-weighed, laboratory-preserved vials containing methanol and deionized water in accordance with EPA Method 5030 / 5035. All soil samples were placed into a cooler and maintained at 4°C until pick-up by laboratory courier under proper chain of custody protocol.

The laboratory data report can be found in Attachment A.

Thank you for the opportunity to be of service to you. If you have any questions or require additional information, please feel free to contact me at (860) 482-6399 or via email at mprelli@best-env.com.

Sincerely yours,
Berkshire Environmental Services & Technology, LLC



Matthew Prelli
Principal / Project Manager

Attachments:

- A. Laboratory Data Report

Z:\Projects 11300-11350\11335 - Soil Test - Harrison\2897 Cover Letter.docx

Attachment A

Laboratory Data Report



Tuesday, October 06, 2020

Attn: Matt Prelli
Berkshire Environmental
214 East Elm Street
Torrington, CT 06790

Project ID: WCA
SDG ID: GCG87683
Sample ID#s: CG87683 - CG87697

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style with a large initial "P".

Phyllis Shiller

Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



SDG Comments

October 06, 2020

SDG I.D.: GCG87683

Please be advised that the NY 375 soil criteria for chromium are based on hexavalent chromium and trivalent chromium.



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Sample Id Cross Reference

October 06, 2020

SDG I.D.: GCG87683

Project ID: WCA

Client Id	Lab Id	Matrix
B-9/0-3.5	CG87683	SOIL
B-8/0-3.5	CG87684	SOIL
COMP/B-8, B-9	CG87685	SOIL
B-6/0-3.5	CG87686	SOIL
B-3/0-10	CG87687	SOIL
B-3A/0-10	CG87688	SOIL
B-2/0-5	CG87689	SOIL
B-1/0-5	CG87690	SOIL
B-7/0-5	CG87691	SOIL
COMP/B-1,B-2,B-6,B-7	CG87692	SOIL
B-5/0-3.5	CG87693	SOIL
B-4/0-3.5	CG87694	SOIL
COMP/B-3,B-4,B-5	CG87695	SOIL
TRIP LL	CG87696	SOIL
TRIP HL	CG87697	SOIL



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

8:21
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87683

Project ID: WCA
 Client ID: B-9/0-3.5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	94		%		09/30/20	CJ	SW846-%Solid

Volatiles (TCL)

1,1,1-Trichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
2-Hexanone	ND	24	ug/kg	1	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	24	ug/kg	1	10/01/20	JLI	SW8260C
Acetone	ND	48	ug/kg	1	10/01/20	JLI	SW8260C
Benzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromochloromethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromoform	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromomethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Chlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Chloroform	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Chloromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Cyclohexane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Dibromochloromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Ethylbenzene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Isopropylbenzene	ND	260	ug/kg	50	10/01/20	JLI SW8260C
m&p-Xylene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	29	ug/kg	1	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	9.7	ug/kg	1	10/01/20	JLI SW8260C
Methylacetate	ND	3.9	ug/kg	1	10/01/20	JLI SW8260C
Methylcyclohexane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Methylene chloride	ND	24	ug/kg	1	10/01/20	JLI SW8260C
o-Xylene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Styrene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Tetrachloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Toluene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Total Xylenes	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Trichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Vinyl chloride	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4	94		%	1	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene	79		%	1	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane	108		%	1	10/01/20	JLI 70 - 130 %
% Toluene-d8	88		%	1	10/01/20	JLI 70 - 130 %
% 1,2-dichlorobenzene-d4 (50x)	98		%	50	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene (50x)	100		%	50	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane (50x)	97		%	50	10/01/20	JLI 70 - 130 %
% Toluene-d8 (50x)	95		%	50	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	73	ug/kg	1	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
-----------	--------	------------	-------	----------	-----------	----

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Volatile Comment:

There was a suppression of the last internal standard in the low level analysis, all affected compounds are reported from the methanol preserved high level analysis which did not exhibit this interference.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

8:35
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87684

Project ID: WCA
 Client ID: B-8/0-3.5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	92		%		09/30/20	CJ	SW846-%Solid

Volatiles (TCL)

1,1,1-Trichloroethane	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	260	ug/kg	50	10/01/20	JLI	SW8260C
2-Hexanone	ND	25	ug/kg	1	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	25	ug/kg	1	10/01/20	JLI	SW8260C
Acetone	ND	49	ug/kg	1	10/01/20	JLI	SW8260C
Benzene	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
Bromochloromethane	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
Bromoform	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
Bromomethane	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C
Chlorobenzene	ND	4.9	ug/kg	1	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroethane	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Chloroform	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Chloromethane	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Cyclohexane	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Dibromochloromethane	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Ethylbenzene	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Isopropylbenzene	ND	260	ug/kg	50	10/01/20	JLI SW8260C
m&p-Xylene	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	30	ug/kg	1	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	9.9	ug/kg	1	10/01/20	JLI SW8260C
Methylacetate	ND	4.0	ug/kg	1	10/01/20	JLI SW8260C
Methylcyclohexane	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Methylene chloride	ND	25	ug/kg	1	10/01/20	JLI SW8260C
o-Xylene	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Styrene	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Tetrachloroethene	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Toluene	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Total Xylenes	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Trichloroethene	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Vinyl chloride	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4	100		%	1	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene	81		%	1	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane	105		%	1	10/01/20	JLI 70 - 130 %
% Toluene-d8	94		%	1	10/01/20	JLI 70 - 130 %
% 1,2-dichlorobenzene-d4 (50x)	98		%	50	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene (50x)	100		%	50	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane (50x)	96		%	50	10/01/20	JLI 70 - 130 %
% Toluene-d8 (50x)	95		%	50	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	74	ug/kg	1	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Volatile Comment:

There was a suppression of the last internal standard in the low level analysis, all affected compounds are reported from the methanol preserved high level analysis which did not exhibit this interference.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

8:44
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87685

Project ID: WCA
 Client ID: COMP/B-8, B-9

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.31	0.31	mg/Kg	1	10/01/20	TH	SW6010D
Aluminum	7450	46	mg/Kg	10	10/01/20	TH	SW6010D
Arsenic	3.92	0.62	mg/Kg	1	10/01/20	TH	SW6010D
Barium	40.2	0.31	mg/Kg	1	10/01/20	TH	SW6010D
Beryllium	< 0.25	0.25	mg/Kg	1	10/01/20	TH	SW6010D
Calcium	76300	46	mg/Kg	10	10/01/20	TH	SW6010D
Cadmium	0.84	0.31	mg/Kg	1	10/01/20	TH	SW6010D
Cobalt	6.55	0.31	mg/Kg	1	10/01/20	TH	SW6010D
Chromium	14.6	0.31	mg/Kg	1	10/01/20	TH	SW6010D
Copper	21.2	0.6	mg/kg	1	10/01/20	TH	SW6010D
Iron	16800	46	mg/Kg	10	10/01/20	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/05/20	MGH	SW7471B
Potassium	1630	4.6	mg/Kg	1	10/01/20	TH	SW6010D
Magnesium	38500	46	mg/Kg	10	10/01/20	TH	SW6010D
Manganese	365	3.1	mg/Kg	10	10/01/20	TH	SW6010D
Sodium	429	4.6	mg/Kg	1	10/01/20	TH	SW6010D
Nickel	15.2	0.31	mg/Kg	1	10/01/20	TH	SW6010D
Lead	14.1	0.31	mg/Kg	1	10/01/20	TH	SW6010D
Antimony	< 3.1	3.1	mg/Kg	1	10/01/20	TH	SW6010D
Selenium	< 1.2	1.2	mg/Kg	1	10/01/20	TH	SW6010D
TCLP Silver	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Arsenic	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Barium	0.41	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Cadmium	< 0.050	0.050	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Chromium	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Mercury	< 0.0002	0.0002	mg/L	1	10/01/20	MGH	SW846 1311/7470
TCLP Lead	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Selenium	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Thallium	< 2.8	2.8	mg/Kg	1	10/01/20	TH SW6010D
TCLP Metals Digestion	Completed				10/01/20	VT/ARW SW3010A
Vanadium	44.8	0.31	mg/Kg	1	10/01/20	TH SW6010D
Zinc	41.3	0.6	mg/Kg	1	10/01/20	TH SW6010D
Percent Solid	95		%		09/30/20	CJ SW846-%Solid
Corrosivity	Negative		Pos/Neg	1	09/30/20	AP SW846-Corr 1
Flash Point	>200	200	Degree F	1	10/01/20	BJA 1010/CH7/ASTMD92
Chromium, Hex. (SW3060 digestion)	< 0.42	0.42	mg/Kg	1	10/01/20	ARG SW7196A
Ignitability	Passed	140	degree F	1	10/01/20	BJA SW846-Ignit 1
pH at 25C - Soil	7.75	1.00	pH Units	1	09/30/20 22:45	AP SW846 9045D 1
Reactivity Cyanide	< 5	5	mg/Kg	1	10/01/20	EG SW846 7.3.3.1/90 1
Reactivity Sulfide	< 20	20	mg/Kg	1	10/01/20	ARG SW846 CH7 1
Reactivity	Negative		Pos/Neg	1	10/01/20	ARG SW846-React 1
Redox Potential	-36.6		mV	1	09/30/20	AP SM2580B-09 1
Total Cyanide (SW9010C Distill.)	< 0.58	0.58	mg/Kg	1	10/05/20	GD SW9012B
Soil Extraction for PCB	Completed				09/30/20	L/A SW3545A
Soil Extraction for Pesticides	Completed				09/30/20	L/A SW3545A
Mercury Digestion	Completed				10/03/20	VT/ARW SW7471B
Extraction of NY ETPH	Completed				09/30/20	/A SW3546
Soil Extraction for Herbicide	Completed				10/01/20	J/D SW3550C
Soil Extraction for SVOA	Completed				09/30/20	R/M SW3546
TCLP Digestion Mercury	Completed				10/01/20	VT/ARW SW7470A
TCLP Herbicides Extraction	Completed				10/01/20	JS/KL/D SW8150 MOD
TCLP Extraction for Metals	Completed				09/30/20	ARW SW1311
TCLP Extraction for Organics	Completed				09/30/20	ARW SW1311
TCLP Pesticides Extraction	Completed				10/01/20	C/C SW3510C
TCLP Semi-Volatile Extraction	Completed				10/01/20	AT/AT SW3510C
TCLP Extraction Volatiles	Completed				09/30/20	CJ SW1311
Total Metals Digest	Completed				09/30/20	S/AG SW3050B

Chlorinated Herbicides

2,4,5-T	ND	130	ug/Kg	10	10/02/20	JRB SW8151A
2,4,5-TP (Silvex)	ND	130	ug/Kg	10	10/02/20	JRB SW8151A
2,4-D	ND	260	ug/Kg	10	10/02/20	JRB SW8151A
2,4-DB	ND	2600	ug/Kg	10	10/02/20	JRB SW8151A
Dalapon	ND	130	ug/Kg	10	10/02/20	JRB SW8151A
Dicamba	ND	130	ug/Kg	10	10/02/20	JRB SW8151A
Dichloroprop	ND	260	ug/Kg	10	10/02/20	JRB SW8151A
Dinoseb	ND	260	ug/Kg	10	10/02/20	JRB SW8151A

QA/QC Surrogates

% DCAA	34		%	10	10/02/20	JRB 30 - 150 %
% DCAA (Confirmation)	35		%	10	10/02/20	JRB 30 - 150 %

Polychlorinated Biphenyls

PCB-1016	ND	68	ug/Kg	2	10/02/20	SC SW8082A
PCB-1221	ND	68	ug/Kg	2	10/02/20	SC SW8082A
PCB-1232	ND	68	ug/Kg	2	10/02/20	SC SW8082A
PCB-1242	ND	68	ug/Kg	2	10/02/20	SC SW8082A
PCB-1248	ND	68	ug/Kg	2	10/02/20	SC SW8082A
PCB-1254	ND	68	ug/Kg	2	10/02/20	SC SW8082A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	
PCB-1260	ND	68	ug/Kg	2	10/02/20	SC	SW8082A
PCB-1262	ND	68	ug/Kg	2	10/02/20	SC	SW8082A
PCB-1268	ND	68	ug/Kg	2	10/02/20	SC	SW8082A
<u>QA/QC Surrogates</u>							
% DCBP	83		%	2	10/02/20	SC	30 - 150 %
% DCBP (Confirmation)	72		%	2	10/02/20	SC	30 - 150 %
% TCMX	74		%	2	10/02/20	SC	30 - 150 %
% TCMX (Confirmation)	72		%	2	10/02/20	SC	30 - 150 %
<u>Pesticides - Soil</u>							
4,4' -DDD	ND	2.0	ug/Kg	2	10/02/20	CG	SW8081B
4,4' -DDE	ND	3.3	ug/Kg	2	10/02/20	CG	SW8081B
4,4' -DDT	ND	2.4	ug/Kg	2	10/02/20	CG	SW8081B
a-BHC	ND	6.8	ug/Kg	2	10/02/20	CG	SW8081B
a-Chlordane	ND	8.4	ug/Kg	2	10/02/20	CG	SW8081B
Aldrin	ND	3.4	ug/Kg	2	10/02/20	CG	SW8081B
b-BHC	ND	6.8	ug/Kg	2	10/02/20	CG	SW8081B
Chlordane	ND	34	ug/Kg	2	10/02/20	CG	SW8081B
d-BHC	ND	6.8	ug/Kg	2	10/02/20	CG	SW8081B
Dieldrin	ND	3.4	ug/Kg	2	10/02/20	CG	SW8081B
Endosulfan I	ND	6.8	ug/Kg	2	10/02/20	CG	SW8081B
Endosulfan II	ND	6.8	ug/Kg	2	10/02/20	CG	SW8081B
Endosulfan sulfate	ND	6.8	ug/Kg	2	10/02/20	CG	SW8081B
Endrin	ND	6.8	ug/Kg	2	10/02/20	CG	SW8081B
Endrin aldehyde	ND	6.8	ug/Kg	2	10/02/20	CG	SW8081B
Endrin ketone	ND	6.8	ug/Kg	2	10/02/20	CG	SW8081B
g-BHC	ND	1.4	ug/Kg	2	10/02/20	CG	SW8081B
g-Chlordane	ND	10	ug/Kg	2	10/02/20	CG	SW8081B
Heptachlor	ND	6.8	ug/Kg	2	10/02/20	CG	SW8081B
Heptachlor epoxide	ND	6.8	ug/Kg	2	10/02/20	CG	SW8081B
Methoxychlor	ND	34	ug/Kg	2	10/02/20	CG	SW8081B
Toxaphene	ND	140	ug/Kg	2	10/02/20	CG	SW8081B
<u>QA/QC Surrogates</u>							
% DCBP	57		%	2	10/02/20	CG	30 - 150 %
% DCBP (Confirmation)	61		%	2	10/02/20	CG	30 - 150 %
% TCMX	77		%	2	10/02/20	CG	30 - 150 %
% TCMX (Confirmation)	78		%	2	10/02/20	CG	30 - 150 %
<u>TCLP Herbicides</u>							
2,4,5-TP (Silvex)	ND	50	ug/L	10	10/03/20	JRB	SW846 1311/8151
2,4-D	ND	100	ug/L	10	10/03/20	JRB	SW846 1311/8151
<u>QA/QC Surrogates</u>							
% DCAA	88		%	10	10/03/20	JRB	30 - 150 %
% DCAA (Confirmation)	94		%	10	10/03/20	JRB	30 - 150 %
<u>TCLP Pesticides</u>							
4,4' -DDD	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
4,4' -DDE	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
4,4' -DDT	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
a-BHC	ND	0.50	ug/L	10	10/02/20	CG	SW8081B

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Alachlor	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Aldrin	ND	0.50	ug/L	10	10/02/20	CG SW8081B
b-BHC	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Chlordane	ND	5.0	ug/L	10	10/02/20	CG SW8081B
d-BHC	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Dieldrin	ND	1.0	ug/L	10	10/02/20	CG SW8081B
Endosulfan I	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Endosulfan II	ND	1.0	ug/L	10	10/02/20	CG SW8081B
Endosulfan Sulfate	ND	1.0	ug/L	10	10/02/20	CG SW8081B
Endrin	ND	1.0	ug/L	10	10/02/20	CG SW8081B
Endrin Aldehyde	ND	1.0	ug/L	10	10/02/20	CG SW8081B
g-BHC (Lindane)	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Heptachlor	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Heptachlor epoxide	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Methoxychlor	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Toxaphene	ND	20	ug/L	10	10/02/20	CG SW8081B
<u>QA/QC Surrogates</u>						
%DCBP (Surrogate Rec)	92		%	10	10/02/20	CG 30 - 150 %
%DCBP (Surrogate Rec) (Confirmation)	93		%	10	10/02/20	CG 30 - 150 %
%TCMX (Surrogate Rec)	101		%	10	10/02/20	CG 30 - 150 %
%TCMX (Surrogate Rec) (Confirmation)	94		%	10	10/02/20	CG 30 - 150 %
<u>TPH DRO (C10-C28)</u>						
Diesel Range Organics (C10-C28)	ND	260	mg/Kg	5	10/06/20	JRB SW-846 8015
<u>QA/QC Surrogates</u>						
% n-Pentacosane	56		%	5	10/06/20	JRB 50 - 150 %
<u>TCLP Volatiles</u>						
1,1-Dichloroethene	ND	50	ug/L	10	10/01/20	HM SW846 1311/8260
1,2-Dichloroethane	ND	50	ug/L	10	10/01/20	HM SW846 1311/8260
Benzene	ND	50	ug/L	10	10/01/20	HM SW846 1311/8260
Carbon tetrachloride	ND	50	ug/L	10	10/01/20	HM SW846 1311/8260
Chlorobenzene	ND	50	ug/L	10	10/01/20	HM SW846 1311/8260
Chloroform	ND	50	ug/L	10	10/01/20	HM SW846 1311/8260
Methyl ethyl ketone	ND	50	ug/L	10	10/01/20	HM SW846 1311/8260
Tetrachloroethene	ND	50	ug/L	10	10/01/20	HM SW846 1311/8260
Trichloroethene	ND	50	ug/L	10	10/01/20	HM SW846 1311/8260
Vinyl chloride	ND	50	ug/L	10	10/01/20	HM SW846 1311/8260
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4 (10x)	99		%	10	10/01/20	HM 70 - 130 %
% Bromofluorobenzene (10x)	97		%	10	10/01/20	HM 70 - 130 %
% Dibromofluoromethane (10x)	98		%	10	10/01/20	HM 70 - 130 %
% Toluene-d8 (10x)	103		%	10	10/01/20	HM 70 - 130 %
<u>Semivolatiles</u>						
1,1-Biphenyl	ND	240	ug/Kg	1	10/01/20	WB SW8270D
1,2,4,5-Tetrachlorobenzene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
2,3,4,6-tetrachlorophenol	ND	240	ug/Kg	1	10/01/20	WB SW8270D
2,4,5-Trichlorophenol	ND	240	ug/Kg	1	10/01/20	WB SW8270D
2,4,6-Trichlorophenol	ND	240	ug/Kg	1	10/01/20	WB SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
2,4-Dichlorophenol	ND	240	ug/Kg	1	10/01/20	WB SW8270D
2,4-Dimethylphenol	ND	240	ug/Kg	1	10/01/20	WB SW8270D
2,4-Dinitrophenol	ND	550	ug/Kg	1	10/01/20	WB SW8270D
2,4-Dinitrotoluene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
2,6-Dinitrotoluene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
2-Chloronaphthalene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
2-Chlorophenol	ND	240	ug/Kg	1	10/01/20	WB SW8270D
2-Methylnaphthalene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
2-Methylphenol (o-cresol)	ND	240	ug/Kg	1	10/01/20	WB SW8270D
2-Nitroaniline	ND	550	ug/Kg	1	10/01/20	WB SW8270D
2-Nitrophenol	ND	240	ug/Kg	1	10/01/20	WB SW8270D
3&4-Methylphenol (m&p-cresol)	ND	340	ug/Kg	1	10/01/20	WB SW8270D
3,3'-Dichlorobenzidine	ND	410	ug/Kg	1	10/01/20	WB SW8270D
3-Nitroaniline	ND	550	ug/Kg	1	10/01/20	WB SW8270D
4,6-Dinitro-2-methylphenol	ND	1000	ug/Kg	1	10/01/20	WB SW8270D
4-Bromophenyl phenyl ether	ND	340	ug/Kg	1	10/01/20	WB SW8270D
4-Chloro-3-methylphenol	ND	240	ug/Kg	1	10/01/20	WB SW8270D
4-Chloroaniline	ND	240	ug/Kg	1	10/01/20	WB SW8270D
4-Chlorophenyl phenyl ether	ND	240	ug/Kg	1	10/01/20	WB SW8270D
4-Nitroaniline	ND	550	ug/Kg	1	10/01/20	WB SW8270D
4-Nitrophenol	ND	1000	ug/Kg	1	10/01/20	WB SW8270D
Acenaphthene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Acenaphthylene	330	240	ug/Kg	1	10/01/20	WB SW8270D
Acetophenone	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Anthracene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Atrazine	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Benz(a)anthracene	470	240	ug/Kg	1	10/01/20	WB SW8270D
Benzaldehyde	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Benzo(a)pyrene	760	240	ug/Kg	1	10/01/20	WB SW8270D
Benzo(b)fluoranthene	710	240	ug/Kg	1	10/01/20	WB SW8270D
Benzo(ghi)perylene	630	240	ug/Kg	1	10/01/20	WB SW8270D
Benzo(k)fluoranthene	590	240	ug/Kg	1	10/01/20	WB SW8270D
Benzyl butyl phthalate	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Bis(2-chloroethoxy)methane	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Bis(2-chloroethyl)ether	ND	340	ug/Kg	1	10/01/20	WB SW8270D
Bis(2-chloroisopropyl)ether	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Bis(2-ethylhexyl)phthalate	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Caprolactam	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Carbazole	ND	340	ug/Kg	1	10/01/20	WB SW8270D
Chrysene	580	240	ug/Kg	1	10/01/20	WB SW8270D
Dibenz(a,h)anthracene	ND	170	ug/Kg	1	10/01/20	WB SW8270D
Dibenzofuran	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Diethyl phthalate	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Dimethylphthalate	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Di-n-butylphthalate	ND	690	ug/Kg	1	10/01/20	WB SW8270D
Di-n-octylphthalate	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Fluoranthene	700	240	ug/Kg	1	10/01/20	WB SW8270D
Fluorene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Hexachlorobenzene	ND	240	ug/Kg	1	10/01/20	WB SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Hexachlorobutadiene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Hexachlorocyclopentadiene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Hexachloroethane	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Indeno(1,2,3-cd)pyrene	640	240	ug/Kg	1	10/01/20	WB SW8270D
Isophorone	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Naphthalene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Nitrobenzene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
N-Nitrosodimethylamine	ND	340	ug/Kg	1	10/01/20	WB SW8270D
N-Nitrosodi-n-propylamine	ND	170	ug/Kg	1	10/01/20	WB SW8270D
N-Nitrosodiphenylamine	ND	340	ug/Kg	1	10/01/20	WB SW8270D
Pentachlorophenol	ND	340	ug/Kg	1	10/01/20	WB SW8270D
Phenanthrene	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Phenol	ND	240	ug/Kg	1	10/01/20	WB SW8270D
Pyrene	740	240	ug/Kg	1	10/01/20	WB SW8270D
<u>QA/QC Surrogates</u>						
% 2,4,6-Tribromophenol	66		%	1	10/01/20	WB 30 - 130 %
% 2-Fluorobiphenyl	56		%	1	10/01/20	WB 30 - 130 %
% 2-Fluorophenol	56		%	1	10/01/20	WB 30 - 130 %
% Nitrobenzene-d5	67		%	1	10/01/20	WB 30 - 130 %
% Phenol-d5	66		%	1	10/01/20	WB 30 - 130 %
% Terphenyl-d14	68		%	1	10/01/20	WB 30 - 130 %
<u>TCLP Acid/Base-Neutral</u>						
1,4-Dichlorobenzene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2,4,5-Trichlorophenol	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2,4,6-Trichlorophenol	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2,4-Dinitrotoluene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2-Methylphenol (o-cresol)	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
3&4-Methylphenol (m&p-Cresol)	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Hexachlorobenzene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Hexachlorobutadiene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Hexachloroethane	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Nitrobenzene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Pentachlorophenol	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Pyridine	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
<u>QA/QC Surrogates</u>						
% 2,4,6-Tribromophenol	81		%	1	10/02/20	WB 15 - 110 %
% 2-Fluorobiphenyl	76		%	1	10/02/20	WB 30 - 130 %
% 2-Fluorophenol	53		%	1	10/02/20	WB 15 - 110 %
% Nitrobenzene-d5	64		%	1	10/02/20	WB 30 - 130 %
% Phenol-d5	47		%	1	10/02/20	WB 15 - 110 %
% Terphenyl-d14	89		%	1	10/02/20	WB 30 - 130 %
SVOA Library Search Top 15	Completed				10/01/20	WB

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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1 = This parameter is not certified by the primary accrediting authority (NY NELAC) for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Please be advised that the NY 375 soil criteria for chromium are based on hexavalent chromium and trivalent chromium.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

Hexavalent Chromium:
This sample is in a reducing state.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

10:16
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87686

Project ID: WCA
 Client ID: B-6/0-3.5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	79		%		09/30/20	CJ	SW846-%Solid

Volatiles (TCL)

1,1,1-Trichloroethane	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
2-Hexanone	ND	23	ug/kg	1	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	23	ug/kg	1	10/01/20	JLI	SW8260C
Acetone	ND	46	ug/kg	1	10/01/20	JLI	SW8260C
Benzene	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
Bromochloromethane	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
Bromoform	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
Bromomethane	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C
Chlorobenzene	ND	4.6	ug/kg	1	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroethane	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Chloroform	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Chloromethane	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Cyclohexane	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Dibromochloromethane	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Ethylbenzene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Isopropylbenzene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
m&p-Xylene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	28	ug/kg	1	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	9.2	ug/kg	1	10/01/20	JLI SW8260C
Methylacetate	ND	3.7	ug/kg	1	10/01/20	JLI SW8260C
Methylcyclohexane	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Methylene chloride	ND	23	ug/kg	1	10/01/20	JLI SW8260C
o-Xylene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Styrene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Tetrachloroethene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Toluene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Total Xylenes	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Trichloroethene	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Vinyl chloride	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4	101		%	1	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene	98		%	1	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane	101		%	1	10/01/20	JLI 70 - 130 %
% Toluene-d8	99		%	1	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	69	ug/kg	1	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.
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Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

11:05
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87687

Project ID: WCA
 Client ID: B-3/0-10

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	91		%		09/30/20	CJ	SW846-%Solid

Volatiles (TCL)

1,1,1-Trichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
2-Hexanone	ND	24	ug/kg	1	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	24	ug/kg	1	10/01/20	JLI	SW8260C
Acetone	ND	48	ug/kg	1	10/01/20	JLI	SW8260C
Benzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromochloromethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromoform	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromomethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Chlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Chloroform	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Chloromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Cyclohexane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Dibromochloromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Ethylbenzene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Isopropylbenzene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
m&p-Xylene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	29	ug/kg	1	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	9.6	ug/kg	1	10/01/20	JLI SW8260C
Methylacetate	ND	3.8	ug/kg	1	10/01/20	JLI SW8260C
Methylcyclohexane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Methylene chloride	ND	24	ug/kg	1	10/01/20	JLI SW8260C
o-Xylene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Styrene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Tetrachloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Toluene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Total Xylenes	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Trichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Vinyl chloride	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4	100		%	1	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene	97		%	1	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane	99		%	1	10/01/20	JLI 70 - 130 %
% Toluene-d8	99		%	1	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	72	ug/kg	1	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.
If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
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Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



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Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

11:13
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87688

Project ID: WCA
 Client ID: B-3A/0-10

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	94		%		09/30/20	CJ	SW846-%Solid

Volatiles (TCL)

1,1,1-Trichloroethane	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
2-Hexanone	ND	29	ug/kg	1	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	29	ug/kg	1	10/01/20	JLI	SW8260C
Acetone	ND	50	ug/kg	1	10/01/20	JLI	SW8260C
Benzene	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromochloromethane	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromoform	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromomethane	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C
Chlorobenzene	ND	5.8	ug/kg	1	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroethane	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Chloroform	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Chloromethane	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Cyclohexane	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Dibromochloromethane	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Ethylbenzene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Isopropylbenzene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
m&p-Xylene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	35	ug/kg	1	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	12	ug/kg	1	10/01/20	JLI SW8260C
Methylacetate	ND	4.6	ug/kg	1	10/01/20	JLI SW8260C
Methylcyclohexane	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Methylene chloride	ND	29	ug/kg	1	10/01/20	JLI SW8260C
o-Xylene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Styrene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Tetrachloroethene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Toluene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Total Xylenes	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Trichloroethene	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
Vinyl chloride	ND	5.8	ug/kg	1	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4	100		%	1	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene	98		%	1	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane	102		%	1	10/01/20	JLI 70 - 130 %
% Toluene-d8	99		%	1	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	87	ug/kg	1	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Volatile Comment:

To achieve client's objectives, where the lowest calibration standard or LOD justifies lowering the RL/PQL, the RL/PQL of some compounds have been lowered to meet criteria.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

11:54
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87689

Project ID: WCA
 Client ID: B-2/0-5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	90		%		09/30/20	CJ	SW846-%Solid

Volatiles (TCL)

1,1,1-Trichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
2-Hexanone	ND	24	ug/kg	1	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	24	ug/kg	1	10/01/20	JLI	SW8260C
Acetone	ND	48	ug/kg	1	10/01/20	JLI	SW8260C
Benzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromochloromethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromoform	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Bromomethane	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C
Chlorobenzene	ND	4.8	ug/kg	1	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Chloroform	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Chloromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Cyclohexane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Dibromochloromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Ethylbenzene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Isopropylbenzene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
m&p-Xylene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	29	ug/kg	1	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	9.7	ug/kg	1	10/01/20	JLI SW8260C
Methylacetate	ND	3.9	ug/kg	1	10/01/20	JLI SW8260C
Methylcyclohexane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Methylene chloride	ND	24	ug/kg	1	10/01/20	JLI SW8260C
o-Xylene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Styrene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Tetrachloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Toluene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Total Xylenes	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Trichloroethene	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
Vinyl chloride	ND	4.8	ug/kg	1	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4	102		%	1	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene	99		%	1	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane	95		%	1	10/01/20	JLI 70 - 130 %
% Toluene-d8	100		%	1	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	73	ug/kg	1	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

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Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

12:41
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87690

Project ID: WCA
 Client ID: B-1/0-5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	93		%		09/30/20	CJ	SW846-%Solid

Volatiles (TCL)

1,1,1-Trichloroethane	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
2-Hexanone	ND	31	ug/kg	1	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	31	ug/kg	1	10/01/20	JLI	SW8260C
Acetone	ND	50	ug/kg	1	10/01/20	JLI	SW8260C
Benzene	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
Bromochloromethane	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
Bromoform	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
Bromomethane	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C
Chlorobenzene	ND	6.2	ug/kg	1	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroethane	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Chloroform	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Chloromethane	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Cyclohexane	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Dibromochloromethane	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Ethylbenzene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Isopropylbenzene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
m&p-Xylene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	37	ug/kg	1	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	12	ug/kg	1	10/01/20	JLI SW8260C
Methylacetate	ND	4.9	ug/kg	1	10/01/20	JLI SW8260C
Methylcyclohexane	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Methylene chloride	ND	31	ug/kg	1	10/01/20	JLI SW8260C
o-Xylene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Styrene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Tetrachloroethene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Toluene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Total Xylenes	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Trichloroethene	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
Vinyl chloride	ND	6.2	ug/kg	1	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4	101		%	1	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene	97		%	1	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane	101		%	1	10/01/20	JLI 70 - 130 %
% Toluene-d8	99		%	1	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	93	ug/kg	1	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Volatile Comment:

To achieve client's objectives, where the lowest calibration standard or LOD justifies lowering the RL/PQL, the RL/PQL of some compounds have been lowered to meet criteria.

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Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
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 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

14:06
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87691

Project ID: WCA
 Client ID: B-7/0-5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	96		%		09/30/20	CJ	SW846-%Solid

Volatiles (TCL)

1,1,1-Trichloroethane	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
2-Hexanone	ND	24	ug/kg	1	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	24	ug/kg	1	10/01/20	JLI	SW8260C
Acetone	ND	47	ug/kg	1	10/01/20	JLI	SW8260C
Benzene	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
Bromochloromethane	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
Bromoform	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
Bromomethane	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C
Chlorobenzene	ND	4.7	ug/kg	1	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroethane	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Chloroform	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Chloromethane	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Cyclohexane	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Dibromochloromethane	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Ethylbenzene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Isopropylbenzene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
m&p-Xylene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	28	ug/kg	1	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	9.5	ug/kg	1	10/01/20	JLI SW8260C
Methylacetate	ND	3.8	ug/kg	1	10/01/20	JLI SW8260C
Methylcyclohexane	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Methylene chloride	ND	24	ug/kg	1	10/01/20	JLI SW8260C
o-Xylene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Styrene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Tetrachloroethene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Toluene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Total Xylenes	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Trichloroethene	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
Vinyl chloride	ND	4.7	ug/kg	1	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4	100		%	1	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene	92		%	1	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane	100		%	1	10/01/20	JLI 70 - 130 %
% Toluene-d8	98		%	1	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	71	ug/kg	1	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.
If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date: 09/29/20 14:21
 09/30/20 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87692

Project ID: WCA
 Client ID: COMP/B-1,B-2,B-6,B-7

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.32	0.32	mg/Kg	1	10/01/20	TH	SW6010D
Aluminum	11100	48	mg/Kg	10	10/01/20	TH	SW6010D
Arsenic	3.88	0.64	mg/Kg	1	10/01/20	TH	SW6010D
Barium	73.3	0.32	mg/Kg	1	10/01/20	TH	SW6010D
Beryllium	0.28	0.26	mg/Kg	1	10/01/20	TH	SW6010D
Calcium	24700	48	mg/Kg	10	10/01/20	TH	SW6010D
Cadmium	1.03	0.32	mg/Kg	1	10/01/20	TH	SW6010D
Cobalt	8.07	0.32	mg/Kg	1	10/01/20	TH	SW6010D
Chromium	20.0	0.32	mg/Kg	1	10/01/20	TH	SW6010D
Copper	16.5	0.6	mg/kg	1	10/01/20	TH	SW6010D
Iron	18200	48	mg/Kg	10	10/01/20	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	2	10/05/20	MGH	SW7471B
Potassium	2130	4.8	mg/Kg	1	10/01/20	TH	SW6010D
Magnesium	17100	48	mg/Kg	10	10/01/20	TH	SW6010D
Manganese	391	3.2	mg/Kg	10	10/01/20	TH	SW6010D
Sodium	300	4.8	mg/Kg	1	10/01/20	TH	SW6010D
Nickel	14.2	0.32	mg/Kg	1	10/01/20	TH	SW6010D
Lead	31.0	0.32	mg/Kg	1	10/01/20	TH	SW6010D
Antimony	< 3.2	3.2	mg/Kg	1	10/01/20	TH	SW6010D
Selenium	< 1.3	1.3	mg/Kg	1	10/01/20	TH	SW6010D
TCLP Silver	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Arsenic	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010 1
TCLP Barium	0.67	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Cadmium	< 0.050	0.050	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Chromium	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Mercury	< 0.0002	0.0002	mg/L	1	10/01/20	MGH	SW846 1311/7470 1
TCLP Lead	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Selenium	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Thallium	< 2.9	2.9	mg/Kg	1	10/01/20	TH SW6010D
TCLP Metals Digestion	Completed				10/01/20	VT/ARW SW3010A
Vanadium	29.9	0.32	mg/Kg	1	10/01/20	TH SW6010D
Zinc	60.4	0.6	mg/Kg	1	10/01/20	TH SW6010D
Percent Solid	92		%		09/30/20	CJ SW846-%Solid
Corrosivity	Negative		Pos/Neg	1	09/30/20	AP SW846-Corr 1
Flash Point	>200	200	Degree F	1	10/01/20	BJA 1010/CH7/ASTMD92
Chromium, Hex. (SW3060 digestion)	< 0.43	0.43	mg/Kg	1	10/01/20	ARG SW7196A
Ignitability	Passed	140	degree F	1	10/01/20	BJA SW846-Ignit 1
pH at 25C - Soil	7.38	1.00	pH Units	1	09/30/20 22:45	AP SW846 9045D 1
Reactivity Cyanide	< 5	5	mg/Kg	1	10/01/20	EG SW846 7.3.3.1/90 1
Reactivity Sulfide	< 20	20	mg/Kg	1	10/01/20	ARG SW846 CH7 1
Reactivity	Negative		Pos/Neg	1	10/01/20	ARG SW846-React 1
Redox Potential	-27.8		mV	1	09/30/20	AP SM2580B-09 1
Total Cyanide (SW9010C Distill.)	< 0.54	0.54	mg/Kg	1	10/05/20	GD SW9012B
Soil Extraction for PCB	Completed				09/30/20	L/A SW3545A
Soil Extraction for Pesticides	Completed				09/30/20	L/A SW3545A
Mercury Digestion	Completed				10/03/20	VT/ARW SW7471B
Extraction of NY ETPH	Completed				09/30/20	/A SW3546
Soil Extraction for Herbicide	Completed				10/01/20	J/D SW3550C
Soil Extraction for SVOA	Completed				09/30/20	R/M SW3546
TCLP Digestion Mercury	Completed				10/01/20	VT/ARW SW7470A
TCLP Herbicides Extraction	Completed				10/01/20	JS/KL/D SW8150 MOD
TCLP Extraction for Metals	Completed				09/30/20	ARW SW1311
TCLP Extraction for Organics	Completed				09/30/20	ARW SW1311
TCLP Pesticides Extraction	Completed				10/01/20	C/C SW3510C
TCLP Semi-Volatile Extraction	Completed				10/01/20	AT/AT SW3510C
TCLP Extraction Volatiles	Completed				09/30/20	CJ SW1311
Total Metals Digest	Completed				09/30/20	S/AG SW3050B

Chlorinated Herbicides

2,4,5-T	ND	130	ug/Kg	10	10/02/20	JRB SW8151A
2,4,5-TP (Silvex)	ND	130	ug/Kg	10	10/02/20	JRB SW8151A
2,4-D	ND	270	ug/Kg	10	10/02/20	JRB SW8151A
2,4-DB	ND	2700	ug/Kg	10	10/02/20	JRB SW8151A
Dalapon	ND	130	ug/Kg	10	10/02/20	JRB SW8151A
Dicamba	ND	130	ug/Kg	10	10/02/20	JRB SW8151A
Dichloroprop	ND	270	ug/Kg	10	10/02/20	JRB SW8151A
Dinoseb	ND	270	ug/Kg	10	10/02/20	JRB SW8151A

QA/QC Surrogates

% DCAA	40		%	10	10/02/20	JRB 30 - 150 %
% DCAA (Confirmation)	37		%	10	10/02/20	JRB 30 - 150 %

Polychlorinated Biphenyls

PCB-1016	ND	72	ug/Kg	2	10/02/20	SC SW8082A
PCB-1221	ND	72	ug/Kg	2	10/02/20	SC SW8082A
PCB-1232	ND	72	ug/Kg	2	10/02/20	SC SW8082A
PCB-1242	ND	72	ug/Kg	2	10/02/20	SC SW8082A
PCB-1248	ND	72	ug/Kg	2	10/02/20	SC SW8082A
PCB-1254	ND	72	ug/Kg	2	10/02/20	SC SW8082A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	
PCB-1260	ND	72	ug/Kg	2	10/02/20	SC	SW8082A
PCB-1262	ND	72	ug/Kg	2	10/02/20	SC	SW8082A
PCB-1268	ND	72	ug/Kg	2	10/02/20	SC	SW8082A
<u>QA/QC Surrogates</u>							
% DCBP	69		%	2	10/02/20	SC	30 - 150 %
% DCBP (Confirmation)	68		%	2	10/02/20	SC	30 - 150 %
% TCMX	67		%	2	10/02/20	SC	30 - 150 %
% TCMX (Confirmation)	65		%	2	10/02/20	SC	30 - 150 %
<u>Pesticides - Soil</u>							
4,4' -DDD	ND	2.2	ug/Kg	2	10/03/20	CG	SW8081B
4,4' -DDE	4.7	2.2	ug/Kg	2	10/03/20	CG	SW8081B
4,4' -DDT	5.1	2.2	ug/Kg	2	10/03/20	CG	SW8081B
a-BHC	ND	7.2	ug/Kg	2	10/03/20	CG	SW8081B
a-Chlordane	ND	3.6	ug/Kg	2	10/03/20	CG	SW8081B
Aldrin	ND	3.6	ug/Kg	2	10/03/20	CG	SW8081B
b-BHC	ND	7.2	ug/Kg	2	10/03/20	CG	SW8081B
Chlordane	ND	36	ug/Kg	2	10/03/20	CG	SW8081B
d-BHC	ND	7.2	ug/Kg	2	10/03/20	CG	SW8081B
Dieldrin	ND	3.6	ug/Kg	2	10/03/20	CG	SW8081B
Endosulfan I	ND	7.2	ug/Kg	2	10/03/20	CG	SW8081B
Endosulfan II	ND	7.2	ug/Kg	2	10/03/20	CG	SW8081B
Endosulfan sulfate	ND	7.2	ug/Kg	2	10/03/20	CG	SW8081B
Endrin	ND	7.2	ug/Kg	2	10/03/20	CG	SW8081B
Endrin aldehyde	ND	7.2	ug/Kg	2	10/03/20	CG	SW8081B
Endrin ketone	ND	7.2	ug/Kg	2	10/03/20	CG	SW8081B
g-BHC	ND	1.4	ug/Kg	2	10/03/20	CG	SW8081B
g-Chlordane	ND	3.6	ug/Kg	2	10/03/20	CG	SW8081B
Heptachlor	ND	7.2	ug/Kg	2	10/03/20	CG	SW8081B
Heptachlor epoxide	ND	7.2	ug/Kg	2	10/03/20	CG	SW8081B
Methoxychlor	ND	36	ug/Kg	2	10/03/20	CG	SW8081B
Toxaphene	ND	140	ug/Kg	2	10/03/20	CG	SW8081B
<u>QA/QC Surrogates</u>							
% DCBP	71		%	2	10/03/20	CG	30 - 150 %
% DCBP (Confirmation)	65		%	2	10/03/20	CG	30 - 150 %
% TCMX	63		%	2	10/03/20	CG	30 - 150 %
% TCMX (Confirmation)	60		%	2	10/03/20	CG	30 - 150 %
<u>TCLP Herbicides</u>							
2,4,5-TP (Silvex)	ND	50	ug/L	10	10/03/20	JRB	SW846 1311/8151
2,4-D	ND	100	ug/L	10	10/03/20	JRB	SW846 1311/8151
<u>QA/QC Surrogates</u>							
% DCAA	85		%	10	10/03/20	JRB	30 - 150 %
% DCAA (Confirmation)	86		%	10	10/03/20	JRB	30 - 150 %
<u>TCLP Pesticides</u>							
4,4' -DDD	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
4,4' -DDE	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
4,4' -DDT	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
a-BHC	ND	0.50	ug/L	10	10/02/20	CG	SW8081B

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	
Alachlor	ND	0.50	ug/L	10	10/02/20	CG	SW8081B
Aldrin	ND	0.50	ug/L	10	10/02/20	CG	SW8081B
b-BHC	ND	0.50	ug/L	10	10/02/20	CG	SW8081B
Chlordane	ND	5.0	ug/L	10	10/02/20	CG	SW8081B
d-BHC	ND	0.50	ug/L	10	10/02/20	CG	SW8081B
Dieldrin	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
Endosulfan I	ND	0.50	ug/L	10	10/02/20	CG	SW8081B
Endosulfan II	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
Endosulfan Sulfate	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
Endrin	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
Endrin Aldehyde	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
g-BHC (Lindane)	ND	0.50	ug/L	10	10/02/20	CG	SW8081B
Heptachlor	ND	0.50	ug/L	10	10/02/20	CG	SW8081B
Heptachlor epoxide	ND	0.50	ug/L	10	10/02/20	CG	SW8081B
Methoxychlor	ND	0.50	ug/L	10	10/02/20	CG	SW8081B
Toxaphene	ND	20	ug/L	10	10/02/20	CG	SW8081B
<u>QA/QC Surrogates</u>							
%DCBP (Surrogate Rec)	91		%	10	10/02/20	CG	30 - 150 %
%DCBP (Surrogate Rec) (Confirmation)	87		%	10	10/02/20	CG	30 - 150 %
%TCMX (Surrogate Rec)	97		%	10	10/02/20	CG	30 - 150 %
%TCMX (Surrogate Rec) (Confirmation)	82		%	10	10/02/20	CG	30 - 150 %
<u>TPH DRO (C10-C28)</u>							
Diesel Range Organics (C10-C28)	ND	54	mg/Kg	1	10/02/20	JRB	SW-846 8015
<u>QA/QC Surrogates</u>							
% n-Pentacosane	76		%	1	10/02/20	JRB	50 - 150 %
<u>TCLP Volatiles</u>							
1,1-Dichloroethene	ND	50	ug/L	10	10/01/20	HM	SW846 1311/8260
1,2-Dichloroethane	ND	50	ug/L	10	10/01/20	HM	SW846 1311/8260
Benzene	ND	50	ug/L	10	10/01/20	HM	SW846 1311/8260
Carbon tetrachloride	ND	50	ug/L	10	10/01/20	HM	SW846 1311/8260
Chlorobenzene	ND	50	ug/L	10	10/01/20	HM	SW846 1311/8260
Chloroform	ND	50	ug/L	10	10/01/20	HM	SW846 1311/8260
Methyl ethyl ketone	ND	50	ug/L	10	10/01/20	HM	SW846 1311/8260
Tetrachloroethene	ND	50	ug/L	10	10/01/20	HM	SW846 1311/8260
Trichloroethene	ND	50	ug/L	10	10/01/20	HM	SW846 1311/8260
Vinyl chloride	ND	50	ug/L	10	10/01/20	HM	SW846 1311/8260
<u>QA/QC Surrogates</u>							
% 1,2-dichlorobenzene-d4 (10x)	101		%	10	10/01/20	HM	70 - 130 %
% Bromofluorobenzene (10x)	98		%	10	10/01/20	HM	70 - 130 %
% Dibromofluoromethane (10x)	97		%	10	10/01/20	HM	70 - 130 %
% Toluene-d8 (10x)	104		%	10	10/01/20	HM	70 - 130 %
<u>Semivolatiles</u>							
1,1-Biphenyl	ND	250	ug/Kg	1	10/01/20	AW	SW8270D
1,2,4,5-Tetrachlorobenzene	ND	250	ug/Kg	1	10/01/20	AW	SW8270D
2,3,4,6-tetrachlorophenol	ND	250	ug/Kg	1	10/01/20	AW	SW8270D
2,4,5-Trichlorophenol	ND	250	ug/Kg	1	10/01/20	AW	SW8270D
2,4,6-Trichlorophenol	ND	250	ug/Kg	1	10/01/20	AW	SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
2,4-Dichlorophenol	ND	250	ug/Kg	1	10/01/20	AW SW8270D
2,4-Dimethylphenol	ND	250	ug/Kg	1	10/01/20	AW SW8270D
2,4-Dinitrophenol	ND	570	ug/Kg	1	10/01/20	AW SW8270D
2,4-Dinitrotoluene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
2,6-Dinitrotoluene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
2-Chloronaphthalene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
2-Chlorophenol	ND	250	ug/Kg	1	10/01/20	AW SW8270D
2-Methylnaphthalene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
2-Methylphenol (o-cresol)	ND	250	ug/Kg	1	10/01/20	AW SW8270D
2-Nitroaniline	ND	570	ug/Kg	1	10/01/20	AW SW8270D
2-Nitrophenol	ND	250	ug/Kg	1	10/01/20	AW SW8270D
3&4-Methylphenol (m&p-cresol)	ND	350	ug/Kg	1	10/01/20	AW SW8270D
3,3'-Dichlorobenzidine	ND	420	ug/Kg	1	10/01/20	AW SW8270D
3-Nitroaniline	ND	570	ug/Kg	1	10/01/20	AW SW8270D
4,6-Dinitro-2-methylphenol	ND	1000	ug/Kg	1	10/01/20	AW SW8270D
4-Bromophenyl phenyl ether	ND	350	ug/Kg	1	10/01/20	AW SW8270D
4-Chloro-3-methylphenol	ND	250	ug/Kg	1	10/01/20	AW SW8270D
4-Chloroaniline	ND	250	ug/Kg	1	10/01/20	AW SW8270D
4-Chlorophenyl phenyl ether	ND	250	ug/Kg	1	10/01/20	AW SW8270D
4-Nitroaniline	ND	570	ug/Kg	1	10/01/20	AW SW8270D
4-Nitrophenol	ND	1000	ug/Kg	1	10/01/20	AW SW8270D
Acenaphthene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Acenaphthylene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Acetophenone	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Anthracene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Atrazine	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Benz(a)anthracene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Benzaldehyde	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Benzo(a)pyrene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Benzo(b)fluoranthene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Benzo(ghi)perylene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Benzo(k)fluoranthene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Benzyl butyl phthalate	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Bis(2-chloroethoxy)methane	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Bis(2-chloroethyl)ether	ND	350	ug/Kg	1	10/01/20	AW SW8270D
Bis(2-chloroisopropyl)ether	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Bis(2-ethylhexyl)phthalate	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Caprolactam	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Carbazole	ND	350	ug/Kg	1	10/01/20	AW SW8270D
Chrysene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Dibenz(a,h)anthracene	ND	180	ug/Kg	1	10/01/20	AW SW8270D
Dibenzofuran	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Diethyl phthalate	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Dimethylphthalate	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Di-n-butylphthalate	ND	710	ug/Kg	1	10/01/20	AW SW8270D
Di-n-octylphthalate	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Fluoranthene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Fluorene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Hexachlorobenzene	ND	250	ug/Kg	1	10/01/20	AW SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Hexachlorobutadiene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Hexachlorocyclopentadiene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Hexachloroethane	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Indeno(1,2,3-cd)pyrene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Isophorone	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Naphthalene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Nitrobenzene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
N-Nitrosodimethylamine	ND	350	ug/Kg	1	10/01/20	AW SW8270D
N-Nitrosodi-n-propylamine	ND	180	ug/Kg	1	10/01/20	AW SW8270D
N-Nitrosodiphenylamine	ND	350	ug/Kg	1	10/01/20	AW SW8270D
Pentachlorophenol	ND	350	ug/Kg	1	10/01/20	AW SW8270D
Phenanthrene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Phenol	ND	250	ug/Kg	1	10/01/20	AW SW8270D
Pyrene	ND	250	ug/Kg	1	10/01/20	AW SW8270D
<u>QA/QC Surrogates</u>						
% 2,4,6-Tribromophenol	89		%	1	10/01/20	AW 30 - 130 %
% 2-Fluorobiphenyl	77		%	1	10/01/20	AW 30 - 130 %
% 2-Fluorophenol	73		%	1	10/01/20	AW 30 - 130 %
% Nitrobenzene-d5	77		%	1	10/01/20	AW 30 - 130 %
% Phenol-d5	79		%	1	10/01/20	AW 30 - 130 %
% Terphenyl-d14	96		%	1	10/01/20	AW 30 - 130 %
<u>TCLP Acid/Base-Neutral</u>						
1,4-Dichlorobenzene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2,4,5-Trichlorophenol	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2,4,6-Trichlorophenol	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2,4-Dinitrotoluene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2-Methylphenol (o-cresol)	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
3&4-Methylphenol (m&p-Cresol)	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Hexachlorobenzene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Hexachlorobutadiene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Hexachloroethane	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Nitrobenzene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Pentachlorophenol	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Pyridine	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
<u>QA/QC Surrogates</u>						
% 2,4,6-Tribromophenol	77		%	1	10/02/20	WB 15 - 110 %
% 2-Fluorobiphenyl	72		%	1	10/02/20	WB 30 - 130 %
% 2-Fluorophenol	52		%	1	10/02/20	WB 15 - 110 %
% Nitrobenzene-d5	68		%	1	10/02/20	WB 30 - 130 %
% Phenol-d5	49		%	1	10/02/20	WB 15 - 110 %
% Terphenyl-d14	89		%	1	10/02/20	WB 30 - 130 %
SVOA Library Search Top 15	Completed				10/01/20	MR

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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1 = This parameter is not certified by the primary accrediting authority (NY NELAC) for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low

QA/QC Surrogates: Surrogates are compounds (preceded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Please be advised that the NY 375 soil criteria for chromium are based on hexavalent chromium and trivalent chromium.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

Hexavalent Chromium:
This sample is in a reducing state.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

14:37
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87693

Project ID: WCA
 Client ID: B-5/0-3.5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	90		%		09/30/20	CJ	SW846-%Solid

Volatiles (TCL)

1,1,1-Trichloroethane	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
2-Hexanone	ND	25	ug/kg	1	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	25	ug/kg	1	10/01/20	JLI	SW8260C
Acetone	ND	50	ug/kg	1	10/01/20	JLI	SW8260C
Benzene	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
Bromochloromethane	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
Bromoform	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
Bromomethane	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C
Chlorobenzene	ND	5.1	ug/kg	1	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroethane	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Chloroform	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Chloromethane	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Cyclohexane	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Dibromochloromethane	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Ethylbenzene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Isopropylbenzene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
m&p-Xylene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	30	ug/kg	1	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	10	ug/kg	1	10/01/20	JLI SW8260C
Methylacetate	ND	4.0	ug/kg	1	10/01/20	JLI SW8260C
Methylcyclohexane	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Methylene chloride	ND	25	ug/kg	1	10/01/20	JLI SW8260C
o-Xylene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Styrene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Tetrachloroethene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Toluene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Total Xylenes	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Trichloroethene	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
Vinyl chloride	ND	5.1	ug/kg	1	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4	101		%	1	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene	92		%	1	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane	97		%	1	10/01/20	JLI 70 - 130 %
% Toluene-d8	97		%	1	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	76	ug/kg	1	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Volatile Comment:

To achieve client's objectives, where the lowest calibration standard or LOD justifies lowering the RL/PQL, the RL/PQL of some compounds have been lowered to meet criteria.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

14:56
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87694

Project ID: WCA
 Client ID: B-4/0-3.5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Percent Solid	97		%		09/30/20	CJ	SW846-%Solid

Volatiles (TCL)

1,1,1-Trichloroethane	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
2-Hexanone	ND	27	ug/kg	1	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	27	ug/kg	1	10/01/20	JLI	SW8260C
Acetone	ND	50	ug/kg	1	10/01/20	JLI	SW8260C
Benzene	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
Bromochloromethane	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
Bromoform	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
Bromomethane	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C
Chlorobenzene	ND	5.5	ug/kg	1	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroethane	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Chloroform	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Chloromethane	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Cyclohexane	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Dibromochloromethane	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Ethylbenzene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Isopropylbenzene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
m&p-Xylene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	33	ug/kg	1	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	11	ug/kg	1	10/01/20	JLI SW8260C
Methylacetate	ND	4.4	ug/kg	1	10/01/20	JLI SW8260C
Methylcyclohexane	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Methylene chloride	ND	27	ug/kg	1	10/01/20	JLI SW8260C
o-Xylene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Styrene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Tetrachloroethene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Toluene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Total Xylenes	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Trichloroethene	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
Vinyl chloride	ND	5.5	ug/kg	1	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4	103		%	1	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene	98		%	1	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane	100		%	1	10/01/20	JLI 70 - 130 %
% Toluene-d8	99		%	1	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	82	ug/kg	1	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Volatile Comment:

To achieve client's objectives, where the lowest calibration standard or LOD justifies lowering the RL/PQL, the RL/PQL of some compounds have been lowered to meet criteria.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
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 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

15:26
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87695

Project ID: WCA
 Client ID: COMP/B-3,B-4,B-5

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	< 0.39	0.39	mg/Kg	1	10/01/20	TH	SW6010D
Aluminum	16400	58	mg/Kg	10	10/01/20	TH	SW6010D
Arsenic	2.28	0.78	mg/Kg	1	10/01/20	TH	SW6010D
Barium	105	0.39	mg/Kg	1	10/01/20	TH	SW6010D
Beryllium	0.40	0.31	mg/Kg	1	10/01/20	TH	SW6010D
Calcium	7010	5.8	mg/Kg	1	10/01/20	TH	SW6010D
Cadmium	1.46	0.39	mg/Kg	1	10/01/20	TH	SW6010D
Cobalt	14.3	0.39	mg/Kg	1	10/01/20	TH	SW6010D
Chromium	28.8	0.39	mg/Kg	1	10/01/20	TH	SW6010D
Copper	31.5	0.8	mg/kg	1	10/01/20	TH	SW6010D
Iron	30200	58	mg/Kg	10	10/01/20	TH	SW6010D
Mercury	< 0.03	0.03	mg/Kg	1	10/05/20	MGH	SW7471B
Potassium	3260	5.8	mg/Kg	1	10/01/20	TH	SW6010D
Magnesium	8640	58	mg/Kg	10	10/01/20	TH	SW6010D
Manganese	492	3.9	mg/Kg	10	10/01/20	TH	SW6010D
Sodium	458	5.8	mg/Kg	1	10/01/20	TH	SW6010D
Nickel	21.3	0.39	mg/Kg	1	10/01/20	TH	SW6010D
Lead	15.4	0.39	mg/Kg	1	10/01/20	TH	SW6010D
Antimony	< 3.9	3.9	mg/Kg	1	10/01/20	TH	SW6010D
Selenium	< 1.6	1.6	mg/Kg	1	10/01/20	TH	SW6010D
TCLP Silver	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Arsenic	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Barium	0.53	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Cadmium	< 0.050	0.050	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Chromium	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Mercury	< 0.0002	0.0002	mg/L	1	10/01/20	MGH	SW846 1311/7470
TCLP Lead	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010
TCLP Selenium	< 0.10	0.10	mg/L	1	10/01/20	TH	SW846 1311/6010D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Thallium	< 3.5	3.5	mg/Kg	1	10/01/20	TH SW6010D
TCLP Metals Digestion	Completed				10/01/20	VT/ARW SW3010A
Vanadium	54.0	0.39	mg/Kg	1	10/01/20	TH SW6010D
Zinc	74.2	0.8	mg/Kg	1	10/01/20	TH SW6010D
Percent Solid	87		%		09/30/20	CJ SW846-%Solid
Corrosivity	Negative		Pos/Neg	1	09/30/20	AP SW846-Corr 1
Flash Point	>200	200	Degree F	1	10/01/20	BJA 1010/CH7/ASTMD92
Chromium, Hex. (SW3060 digestion)	< 0.45	0.45	mg/Kg	1	10/01/20	ARG SW7196A
Ignitability	Passed	140	degree F	1	10/01/20	BJA SW846-Ignit 1
pH at 25C - Soil	7.60	1.00	pH Units	1	09/30/20 22:45	AP SW846 9045D 1
Reactivity Cyanide	< 6	6	mg/Kg	1	10/01/20	EG SW846 7.3.3.1/90 1
Reactivity Sulfide	< 20	20	mg/Kg	1	10/01/20	ARG SW846 CH7 1
Reactivity	Negative		Pos/Neg	1	10/01/20	ARG SW846-React 1
Redox Potential	-16.8		mV	1	09/30/20	AP SM2580B-09 1
Total Cyanide (SW9010C Distill.)	< 0.52	0.52	mg/Kg	1	10/05/20	GD SW9012B
Soil Extraction for PCB	Completed				09/30/20	L/E SW3545A
Soil Extraction for Pesticides	Completed				09/30/20	L/E SW3545A
Mercury Digestion	Completed				10/03/20	VT/ARW SW7471B
Extraction of NY ETPH	Completed				09/30/20	/A SW3546
Soil Extraction for Herbicide	Completed				10/01/20	J/D SW3550C
Soil Extraction for SVOA	Completed				09/30/20	R/M SW3546
TCLP Digestion Mercury	Completed				10/01/20	VT/ARW SW7470A
TCLP Herbicides Extraction	Completed				10/01/20	JS/KL/D SW8150 MOD
TCLP Extraction for Metals	Completed				09/30/20	ARW SW1311
TCLP Extraction for Organics	Completed				09/30/20	ARW SW1311
TCLP Pesticides Extraction	Completed				10/01/20	C/C SW3510C
TCLP Semi-Volatile Extraction	Completed				10/01/20	AT/AT SW3510C
TCLP Extraction Volatiles	Completed				09/30/20	CJ SW1311
Total Metals Digest	Completed				09/30/20	S/AG SW3050B

Chlorinated Herbicides

2,4,5-T	ND	140	ug/Kg	10	10/02/20	JRB SW8151A
2,4,5-TP (Silvex)	ND	140	ug/Kg	10	10/02/20	JRB SW8151A
2,4-D	ND	280	ug/Kg	10	10/02/20	JRB SW8151A
2,4-DB	ND	2800	ug/Kg	10	10/02/20	JRB SW8151A
Dalapon	ND	140	ug/Kg	10	10/02/20	JRB SW8151A
Dicamba	ND	140	ug/Kg	10	10/02/20	JRB SW8151A
Dichloroprop	ND	280	ug/Kg	10	10/02/20	JRB SW8151A
Dinoseb	ND	280	ug/Kg	10	10/02/20	JRB SW8151A

QA/QC Surrogates

% DCAA	49		%	10	10/02/20	JRB 30 - 150 %
% DCAA (Confirmation)	47		%	10	10/02/20	JRB 30 - 150 %

Polychlorinated Biphenyls

PCB-1016	ND	75	ug/Kg	2	10/01/20	SC SW8082A
PCB-1221	ND	75	ug/Kg	2	10/01/20	SC SW8082A
PCB-1232	ND	75	ug/Kg	2	10/01/20	SC SW8082A
PCB-1242	ND	75	ug/Kg	2	10/01/20	SC SW8082A
PCB-1248	ND	75	ug/Kg	2	10/01/20	SC SW8082A
PCB-1254	ND	75	ug/Kg	2	10/01/20	SC SW8082A

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	
PCB-1260	ND	75	ug/Kg	2	10/01/20	SC	SW8082A
PCB-1262	ND	75	ug/Kg	2	10/01/20	SC	SW8082A
PCB-1268	ND	75	ug/Kg	2	10/01/20	SC	SW8082A
<u>QA/QC Surrogates</u>							
% DCBP	67		%	2	10/01/20	SC	30 - 150 %
% DCBP (Confirmation)	59		%	2	10/01/20	SC	30 - 150 %
% TCMX	69		%	2	10/01/20	SC	30 - 150 %
% TCMX (Confirmation)	65		%	2	10/01/20	SC	30 - 150 %
<u>Pesticides - Soil</u>							
4,4' -DDD	4.4	2.2	ug/Kg	2	10/01/20	CG	SW8081B
4,4' -DDE	9.6	2.2	ug/Kg	2	10/01/20	CG	SW8081B
4,4' -DDT	9.9	2.2	ug/Kg	2	10/01/20	CG	SW8081B
a-BHC	ND	7.5	ug/Kg	2	10/01/20	CG	SW8081B
a-Chlordane	ND	3.7	ug/Kg	2	10/01/20	CG	SW8081B
Aldrin	ND	3.7	ug/Kg	2	10/01/20	CG	SW8081B
b-BHC	ND	7.5	ug/Kg	2	10/01/20	CG	SW8081B
Chlordane	ND	37	ug/Kg	2	10/01/20	CG	SW8081B
d-BHC	ND	7.5	ug/Kg	2	10/01/20	CG	SW8081B
Dieldrin	ND	3.7	ug/Kg	2	10/01/20	CG	SW8081B
Endosulfan I	ND	7.5	ug/Kg	2	10/01/20	CG	SW8081B
Endosulfan II	ND	7.5	ug/Kg	2	10/01/20	CG	SW8081B
Endosulfan sulfate	ND	7.5	ug/Kg	2	10/01/20	CG	SW8081B
Endrin	ND	7.5	ug/Kg	2	10/01/20	CG	SW8081B
Endrin aldehyde	ND	7.5	ug/Kg	2	10/01/20	CG	SW8081B
Endrin ketone	ND	7.5	ug/Kg	2	10/01/20	CG	SW8081B
g-BHC	ND	1.5	ug/Kg	2	10/01/20	CG	SW8081B
g-Chlordane	ND	3.7	ug/Kg	2	10/01/20	CG	SW8081B
Heptachlor	ND	7.5	ug/Kg	2	10/01/20	CG	SW8081B
Heptachlor epoxide	ND	7.5	ug/Kg	2	10/01/20	CG	SW8081B
Methoxychlor	ND	37	ug/Kg	2	10/01/20	CG	SW8081B
Toxaphene	ND	150	ug/Kg	2	10/01/20	CG	SW8081B
<u>QA/QC Surrogates</u>							
% DCBP	63		%	2	10/01/20	CG	30 - 150 %
% DCBP (Confirmation)	56		%	2	10/01/20	CG	30 - 150 %
% TCMX	65		%	2	10/01/20	CG	30 - 150 %
% TCMX (Confirmation)	47		%	2	10/01/20	CG	30 - 150 %
<u>TCLP Herbicides</u>							
2,4,5-TP (Silvex)	ND	50	ug/L	10	10/03/20	JRB	SW846 1311/8151
2,4-D	ND	100	ug/L	10	10/03/20	JRB	SW846 1311/8151
<u>QA/QC Surrogates</u>							
% DCAA	91		%	10	10/03/20	JRB	30 - 150 %
% DCAA (Confirmation)	98		%	10	10/03/20	JRB	30 - 150 %
<u>TCLP Pesticides</u>							
4,4' -DDD	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
4,4' -DDE	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
4,4' -DDT	ND	1.0	ug/L	10	10/02/20	CG	SW8081B
a-BHC	ND	0.50	ug/L	10	10/02/20	CG	SW8081B

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Alachlor	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Aldrin	ND	0.50	ug/L	10	10/02/20	CG SW8081B
b-BHC	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Chlordane	ND	5.0	ug/L	10	10/02/20	CG SW8081B
d-BHC	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Dieldrin	ND	1.0	ug/L	10	10/02/20	CG SW8081B
Endosulfan I	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Endosulfan II	ND	1.0	ug/L	10	10/02/20	CG SW8081B
Endosulfan Sulfate	ND	1.0	ug/L	10	10/02/20	CG SW8081B
Endrin	ND	1.0	ug/L	10	10/02/20	CG SW8081B
Endrin Aldehyde	ND	1.0	ug/L	10	10/02/20	CG SW8081B
g-BHC (Lindane)	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Heptachlor	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Heptachlor epoxide	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Methoxychlor	ND	0.50	ug/L	10	10/02/20	CG SW8081B
Toxaphene	ND	20	ug/L	10	10/02/20	CG SW8081B
<u>QA/QC Surrogates</u>						
%DCBP (Surrogate Rec)	94		%	10	10/02/20	CG 30 - 150 %
%DCBP (Surrogate Rec) (Confirmation)	90		%	10	10/02/20	CG 30 - 150 %
%TCMX (Surrogate Rec)	91		%	10	10/02/20	CG 30 - 150 %
%TCMX (Surrogate Rec) (Confirmation)	81		%	10	10/02/20	CG 30 - 150 %
<u>TPH DRO (C10-C28)</u>						
Diesel Range Organics (C10-C28)	ND	280	mg/Kg	5	10/05/20	JRB SW-846 8015
<u>QA/QC Surrogates</u>						
% n-Pentacosane	74		%	5	10/05/20	JRB 50 - 150 %
<u>TCLP Volatiles</u>						
1,1-Dichloroethene	ND	50	ug/L	10	10/02/20	HM SW846 1311/8260
1,2-Dichloroethane	ND	50	ug/L	10	10/02/20	HM SW846 1311/8260
Benzene	ND	50	ug/L	10	10/02/20	HM SW846 1311/8260
Carbon tetrachloride	ND	50	ug/L	10	10/02/20	HM SW846 1311/8260
Chlorobenzene	ND	50	ug/L	10	10/02/20	HM SW846 1311/8260
Chloroform	ND	50	ug/L	10	10/02/20	HM SW846 1311/8260
Methyl ethyl ketone	ND	50	ug/L	10	10/02/20	HM SW846 1311/8260
Tetrachloroethene	ND	50	ug/L	10	10/02/20	HM SW846 1311/8260
Trichloroethene	ND	50	ug/L	10	10/02/20	HM SW846 1311/8260
Vinyl chloride	ND	50	ug/L	10	10/02/20	HM SW846 1311/8260
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4 (10x)	99		%	10	10/02/20	HM 70 - 130 %
% Bromofluorobenzene (10x)	97		%	10	10/02/20	HM 70 - 130 %
% Dibromofluoromethane (10x)	103		%	10	10/02/20	HM 70 - 130 %
% Toluene-d8 (10x)	104		%	10	10/02/20	HM 70 - 130 %
<u>Semivolatiles</u>						
1,1-Biphenyl	ND	260	ug/Kg	1	10/01/20	WB SW8270D
1,2,4,5-Tetrachlorobenzene	ND	260	ug/Kg	1	10/01/20	WB SW8270D
2,3,4,6-tetrachlorophenol	ND	260	ug/Kg	1	10/01/20	WB SW8270D
2,4,5-Trichlorophenol	ND	260	ug/Kg	1	10/01/20	WB SW8270D
2,4,6-Trichlorophenol	ND	260	ug/Kg	1	10/01/20	WB SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
2,4-Dichlorophenol	ND	260	ug/Kg	1	10/01/20	WB SW8270D
2,4-Dimethylphenol	ND	260	ug/Kg	1	10/01/20	WB SW8270D
2,4-Dinitrophenol	ND	600	ug/Kg	1	10/01/20	WB SW8270D
2,4-Dinitrotoluene	ND	260	ug/Kg	1	10/01/20	WB SW8270D
2,6-Dinitrotoluene	ND	260	ug/Kg	1	10/01/20	WB SW8270D
2-Chloronaphthalene	ND	260	ug/Kg	1	10/01/20	WB SW8270D
2-Chlorophenol	ND	260	ug/Kg	1	10/01/20	WB SW8270D
2-Methylnaphthalene	ND	260	ug/Kg	1	10/01/20	WB SW8270D
2-Methylphenol (o-cresol)	ND	260	ug/Kg	1	10/01/20	WB SW8270D
2-Nitroaniline	ND	600	ug/Kg	1	10/01/20	WB SW8270D
2-Nitrophenol	ND	260	ug/Kg	1	10/01/20	WB SW8270D
3&4-Methylphenol (m&p-cresol)	ND	370	ug/Kg	1	10/01/20	WB SW8270D
3,3'-Dichlorobenzidine	ND	450	ug/Kg	1	10/01/20	WB SW8270D
3-Nitroaniline	ND	600	ug/Kg	1	10/01/20	WB SW8270D
4,6-Dinitro-2-methylphenol	ND	1100	ug/Kg	1	10/01/20	WB SW8270D
4-Bromophenyl phenyl ether	ND	370	ug/Kg	1	10/01/20	WB SW8270D
4-Chloro-3-methylphenol	ND	260	ug/Kg	1	10/01/20	WB SW8270D
4-Chloroaniline	ND	260	ug/Kg	1	10/01/20	WB SW8270D
4-Chlorophenyl phenyl ether	ND	260	ug/Kg	1	10/01/20	WB SW8270D
4-Nitroaniline	ND	600	ug/Kg	1	10/01/20	WB SW8270D
4-Nitrophenol	ND	1100	ug/Kg	1	10/01/20	WB SW8270D
Acenaphthene	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Acenaphthylene	400	260	ug/Kg	1	10/01/20	WB SW8270D
Acetophenone	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Anthracene	300	260	ug/Kg	1	10/01/20	WB SW8270D
Atrazine	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Benz(a)anthracene	900	260	ug/Kg	1	10/01/20	WB SW8270D
Benzaldehyde	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Benzo(a)pyrene	1000	260	ug/Kg	1	10/01/20	WB SW8270D
Benzo(b)fluoranthene	970	260	ug/Kg	1	10/01/20	WB SW8270D
Benzo(ghi)perylene	770	260	ug/Kg	1	10/01/20	WB SW8270D
Benzo(k)fluoranthene	990	260	ug/Kg	1	10/01/20	WB SW8270D
Benzyl butyl phthalate	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Bis(2-chloroethoxy)methane	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Bis(2-chloroethyl)ether	ND	370	ug/Kg	1	10/01/20	WB SW8270D
Bis(2-chloroisopropyl)ether	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Bis(2-ethylhexyl)phthalate	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Caprolactam	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Carbazole	ND	370	ug/Kg	1	10/01/20	WB SW8270D
Chrysene	1100	260	ug/Kg	1	10/01/20	WB SW8270D
Dibenz(a,h)anthracene	ND	190	ug/Kg	1	10/01/20	WB SW8270D
Dibenzofuran	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Diethyl phthalate	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Dimethylphthalate	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Di-n-butylphthalate	ND	750	ug/Kg	1	10/01/20	WB SW8270D
Di-n-octylphthalate	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Fluoranthene	1700	260	ug/Kg	1	10/01/20	WB SW8270D
Fluorene	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Hexachlorobenzene	ND	260	ug/Kg	1	10/01/20	WB SW8270D

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Hexachlorobutadiene	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Hexachlorocyclopentadiene	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Hexachloroethane	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Indeno(1,2,3-cd)pyrene	800	260	ug/Kg	1	10/01/20	WB SW8270D
Isophorone	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Naphthalene	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Nitrobenzene	ND	260	ug/Kg	1	10/01/20	WB SW8270D
N-Nitrosodimethylamine	ND	370	ug/Kg	1	10/01/20	WB SW8270D
N-Nitrosodi-n-propylamine	ND	190	ug/Kg	1	10/01/20	WB SW8270D
N-Nitrosodiphenylamine	ND	370	ug/Kg	1	10/01/20	WB SW8270D
Pentachlorophenol	ND	370	ug/Kg	1	10/01/20	WB SW8270D
Phenanthrene	1100	260	ug/Kg	1	10/01/20	WB SW8270D
Phenol	ND	260	ug/Kg	1	10/01/20	WB SW8270D
Pyrene	1600	260	ug/Kg	1	10/01/20	WB SW8270D
<u>QA/QC Surrogates</u>						
% 2,4,6-Tribromophenol	85		%	1	10/01/20	WB 30 - 130 %
% 2-Fluorobiphenyl	88		%	1	10/01/20	WB 30 - 130 %
% 2-Fluorophenol	67		%	1	10/01/20	WB 30 - 130 %
% Nitrobenzene-d5	81		%	1	10/01/20	WB 30 - 130 %
% Phenol-d5	71		%	1	10/01/20	WB 30 - 130 %
% Terphenyl-d14	80		%	1	10/01/20	WB 30 - 130 %
<u>TCLP Acid/Base-Neutral</u>						
1,4-Dichlorobenzene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2,4,5-Trichlorophenol	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2,4,6-Trichlorophenol	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2,4-Dinitrotoluene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
2-Methylphenol (o-cresol)	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
3&4-Methylphenol (m&p-Cresol)	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Hexachlorobenzene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Hexachlorobutadiene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Hexachloroethane	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Nitrobenzene	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Pentachlorophenol	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
Pyridine	ND	83	ug/L	1	10/02/20	WB SW-846 1311/8270
<u>QA/QC Surrogates</u>						
% 2,4,6-Tribromophenol	84		%	1	10/02/20	WB 15 - 110 %
% 2-Fluorobiphenyl	72		%	1	10/02/20	WB 30 - 130 %
% 2-Fluorophenol	50		%	1	10/02/20	WB 15 - 110 %
% Nitrobenzene-d5	67		%	1	10/02/20	WB 30 - 130 %
% Phenol-d5	49		%	1	10/02/20	WB 15 - 110 %
% Terphenyl-d14	87		%	1	10/02/20	WB 30 - 130 %
SVOA Library Search Top 15	Completed				10/01/20	MR

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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1 = This parameter is not certified by the primary accrediting authority (NY NELAC) for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low

QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

The TPH (C10-C28) is quantitated using an alkane standard.

Corrosivity is based solely on the pH analysis performed above.

Please be advised that the NY 375 soil criteria for chromium are based on hexavalent chromium and trivalent chromium.

Ignitability is based solely on the results of the closed cup flashpoint analysis performed above. Passed is >140 degree F.

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Cyanide. This method is no longer listed in the current version of SW-846.

The reactivity, reported above, is based only on the EPA Interim Guidance for Reactive Sulfide. This method is no longer listed in the current version of SW-846.

Hexavalent Chromium:
This sample is in a reducing state.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
 Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

8:21
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87696

Project ID: WCA
 Client ID: TRIP LL

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Volatiles (TCL)							
1,1,1-Trichloroethane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
2-Hexanone	ND	25	ug/kg	1	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	25	ug/kg	1	10/01/20	JLI	SW8260C
Acetone	ND	50	ug/kg	1	10/01/20	JLI	SW8260C
Benzene	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
Bromochloromethane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
Bromoform	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
Bromomethane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
Chlorobenzene	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C
Chloroethane	ND	5.0	ug/kg	1	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroform	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Chloromethane	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Cyclohexane	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Dibromochloromethane	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Ethylbenzene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Isopropylbenzene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
m&p-Xylene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	30	ug/kg	1	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	10	ug/kg	1	10/01/20	JLI SW8260C
Methylacetate	ND	4.0	ug/kg	1	10/01/20	JLI SW8260C
Methylcyclohexane	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Methylene chloride	ND	25	ug/kg	1	10/01/20	JLI SW8260C
o-Xylene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Styrene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Tetrachloroethene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Toluene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Total Xylenes	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Trichloroethene	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
Vinyl chloride	ND	5.0	ug/kg	1	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4	101		%	1	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene	97		%	1	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane	100		%	1	10/01/20	JLI 70 - 130 %
% Toluene-d8	99		%	1	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	75	ug/kg	1	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

TRIP BLANK INCLUDED.

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

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Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



Environmental Laboratories, Inc.
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Analysis Report

October 06, 2020

FOR: Attn: Matt Prelli
 Berkshire Environmental
 214 East Elm Street
 Torrington, CT 06790

Sample Information

Matrix: SOIL
 Location Code: BERK-ENV
 Rush Request: Standard
 P.O.#: 11335.1

Custody Information

Collected by: MP
 Received by: SW
 Analyzed by: see "By" below

Date

09/29/20
 09/30/20

Time

8:21
 11:56

Laboratory Data

SDG ID: GCG87683
 Phoenix ID: CG87697

Project ID: WCA
 Client ID: TRIP HL

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Volatiles (TCL)							
1,1,1-Trichloroethane	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,1,2,2-Tetrachloroethane	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,1,2-Trichloroethane	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,1-Dichloroethane	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,1-Dichloroethene	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,2,3-Trichlorobenzene	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,2,4-Trichlorobenzene	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,2-Dibromo-3-chloropropane	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,2-Dibromoethane	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,2-Dichlorobenzene	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,2-Dichloroethane	ND	25	ug/kg	50	10/01/20	JLI	SW8260C
1,2-Dichloropropane	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,3-Dichlorobenzene	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
1,4-Dichlorobenzene	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
2-Hexanone	ND	1300	ug/kg	50	10/01/20	JLI	SW8260C
4-Methyl-2-pentanone	ND	1300	ug/kg	50	10/01/20	JLI	SW8260C
Acetone	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
Benzene	ND	60	ug/kg	50	10/01/20	JLI	SW8260C
Bromochloromethane	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
Bromodichloromethane	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
Bromoform	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
Bromomethane	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
Carbon Disulfide	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
Carbon tetrachloride	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
Chlorobenzene	ND	250	ug/kg	50	10/01/20	JLI	SW8260C
Chloroethane	ND	250	ug/kg	50	10/01/20	JLI	SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
Chloroform	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Chloromethane	ND	250	ug/kg	50	10/01/20	JLI SW8260C
cis-1,2-Dichloroethene	ND	250	ug/kg	50	10/01/20	JLI SW8260C
cis-1,3-Dichloropropene	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Cyclohexane	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Dibromochloromethane	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Dichlorodifluoromethane	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Ethylbenzene	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Isopropylbenzene	ND	250	ug/kg	50	10/01/20	JLI SW8260C
m&p-Xylene	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Methyl ethyl ketone	ND	120	ug/kg	50	10/01/20	JLI SW8260C
Methyl t-butyl ether (MTBE)	ND	500	ug/kg	50	10/01/20	JLI SW8260C
Methylacetate	ND	200	ug/kg	50	10/01/20	JLI SW8260C
Methylcyclohexane	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Methylene chloride	ND	100	ug/kg	50	10/01/20	JLI SW8260C
o-Xylene	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Styrene	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Tetrachloroethene	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Toluene	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Total Xylenes	ND	250	ug/kg	50	10/01/20	JLI SW8260C
trans-1,2-Dichloroethene	ND	190	ug/kg	50	10/01/20	JLI SW8260C
trans-1,3-Dichloropropene	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Trichloroethene	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Trichlorofluoromethane	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Trichlorotrifluoroethane	ND	250	ug/kg	50	10/01/20	JLI SW8260C
Vinyl chloride	ND	25	ug/kg	50	10/01/20	JLI SW8260C
<u>QA/QC Surrogates</u>						
% 1,2-dichlorobenzene-d4 (50x)	100		%	50	10/01/20	JLI 70 - 130 %
% Bromofluorobenzene (50x)	97		%	50	10/01/20	JLI 70 - 130 %
% Dibromofluoromethane (50x)	98		%	50	10/01/20	JLI 70 - 130 %
% Toluene-d8 (50x)	99		%	50	10/01/20	JLI 70 - 130 %
<u>1,4-dioxane</u>						
1,4-dioxane	ND	2000	ug/kg	50	10/01/20	JLI SW8260C

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By
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RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level L=Biased Low
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

Comments:

Results are reported on an ``as received`` basis, and are not corrected for dry weight.

Volatile Comment:

To achieve client's objectives, where the lowest calibration standard or LOD justifies lowering the RL/PQL, the RL/PQL of some compounds have been lowered to meet criteria.

All soils, solids and sludges are reported on a dry weight basis unless otherwise noted in the sample comments.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.



Phyllis Shiller, Laboratory Director

October 06, 2020

Reviewed and Released by: Greg Lawrence, Assistant Lab Director



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QA/QC Report

October 06, 2020

QA/QC Data

SDG I.D.: GCG87683

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCS D %	LCS RPD	MS %	MS D %	MS RPD	% Rec Limits	% RPD Limits
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QA/QC Batch 547659 (mg/kg), QC Sample No: CG88217 40X (CG87685, CG87692, CG87695)

Chromium, Hexavalent - Soil

Chromium, Hexavalent	BRL	0.40	<0.40	<0.40	NC	102						85 - 115	30
Chromium, Hexavalent (Ins)						108			90.1			85 - 115	30
Chromium, Hexavalent (Sol)						106			39.3			85 - 115	30 m

Comment:

The QC sample is in a reducing state, acceptance criteria are not applicable for samples in a reducing state. The soluble spike was analyzed twice with similar recoveries.

QA/QC Batch 547667 (mg/L), QC Sample No: CG86543 (CG87685, CG87692, CG87695)

Mercury - Water	BRL	0.0002	<0.0002	<0.0002	NC	87.4			87.1			80 - 120	20
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Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.

QA/QC Batch 548050 (mg/kg), QC Sample No: CG89876 2X (CG87685)

Mercury - Soil	BRL	0.03	0.02	<0.03	NC	110	104	5.6	100	102	2.0	70 - 130	30
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Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.

QA/QC Batch 548051 (mg/kg), QC Sample No: CG89901 2X (CG87692)

Mercury - Soil	BRL	0.02	0.04	0.05	NC	102	94.4	7.7	106	106	0.0	70 - 130	30
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Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.

QA/QC Batch 548052 (mg/kg), QC Sample No: CG89918 (CG87695)

Mercury - Soil	BRL	0.03	0.06	0.04	NC	95.6	96.9	1.4	83.4	87.3	4.6	70 - 130	30
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Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.

QA/QC Batch 547672 (mg/L), QC Sample No: CG86543 (CG87685, CG87692, CG87695)

ICP Metals - TCLP Extraction

Arsenic	BRL	0.05	<0.05	0.02	NC	108	108	0.0	110			80 - 120	20
Barium	BRL	0.01	0.17	0.18	5.70	100	99.6	0.4	106			80 - 120	20
Cadmium	BRL	0.005	<0.004	<0.005	NC	99.0	98.1	0.9	98.9			80 - 120	20
Chromium	BRL	0.010	<0.010	<0.010	NC	102	101	1.0	101			80 - 120	20
Lead	BRL	0.010	0.315	0.314	0.30	94.0	92.6	1.5	93.1			80 - 120	20
Selenium	BRL	0.01	<0.04	<0.01	NC	108	108	0.0	110			80 - 120	20
Silver	BRL	0.010	<0.005	<0.010	NC	99.3	98.2	1.1	99.4			80 - 120	20

Comment:

Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

QA/QC Batch 547610 (mg/kg), QC Sample No: CG87685 (CG87685, CG87692, CG87695)

ICP Metals - Soil

Aluminum	BRL	5.0	7450	6720	10.3	96.3	87.5	9.6	NC			75 - 125	35
Antimony	BRL	3.3	<3.1	<3.3	NC	96.4	91.3	5.4	101			75 - 125	35
Arsenic	BRL	0.67	3.92	2.72	NC	105	94.4	10.6	105			75 - 125	35

QA/QC Data

SDG I.D.: GCG87683

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
Barium	BRL	0.33	40.2	85.9	72.5	105	99.4	5.5	117			75 - 125	35	r
Beryllium	BRL	0.27	<0.25	<0.27	NC	112	110	1.8	105			75 - 125	35	
Cadmium	BRL	0.33	0.84	0.76	NC	111	117	5.3	105			75 - 125	35	
Calcium	BRL	5.0	76300	92600	19.3	100	100	0.0	NC			75 - 125	35	
Chromium	BRL	0.33	14.6	11.9	20.4	104	101	2.9	106			75 - 125	35	
Cobalt	BRL	0.33	6.55	6.37	2.80	110	112	1.8	103			75 - 125	35	
Copper	BRL	0.67	21.2	28.6	29.7	95.1	93.0	2.2	103			75 - 125	35	
Iron	BRL	5.0	16800	14400	15.4	80.6	79.8	1.0	NC			75 - 125	35	
Lead	BRL	0.33	14.1	10.9	25.6	103	93.0	10.2	109			75 - 125	35	
Magnesium	BRL	5.0	38500	35800	7.30	103	93.1	10.1	NC			75 - 125	35	
Manganese	BRL	0.33	365	298	20.2	103	124	18.5	69.9			75 - 125	35	m
Nickel	BRL	0.33	15.2	13.1	14.8	112	114	1.8	101			75 - 125	35	
Potassium	BRL	5.0	1630	1870	13.7	111	98.6	11.8	>130			75 - 125	35	m
Selenium	BRL	1.3	<1.2	<1.3	NC	92.0	84.0	9.1	101			75 - 125	35	
Silver	BRL	0.33	<0.31	<0.33	NC	84.1	87.8	4.3	96.8			75 - 125	35	
Sodium	BRL	5.0	429	372	14.2	84.1	77.4	8.3	>130			75 - 125	35	m
Thallium	BRL	3.0	<2.8	<3.0	NC	103	105	1.9	101			75 - 125	35	
Vanadium	BRL	0.33	44.8	41.3	8.10	103	95.2	7.9	103			75 - 125	35	
Zinc	BRL	0.67	41.3	36.8	11.5	103	101	2.0	106			75 - 125	35	

Comment:

Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

m = This parameter is outside laboratory MS/MSD specified recovery limits.

r = This parameter is outside laboratory RPD specified recovery limits.



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QA/QC Report

October 06, 2020

QA/QC Data

SDG I.D.: GCG87683

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 547661 (mg/Kg), QC Sample No: CG87424 5X (CG87685, CG87692, CG87695)													
Reactivity Cyanide	BRL	5	<6	<5.6	NC	99.5						85 - 115	30
Reactivity Sulfide	BRL	20	<20	<20	NC	95.0						80 - 120	30
QA/QC Batch 547879 (mg/Kg), QC Sample No: CG88090 55.6X (CG87685, CG87692, CG87695)													
Total Cyanide (SW9010C Distill.)	BRL	0.56	<0.53	<0.48	NC	98.6			108			80 - 120	30
Comment: Additional: LCS acceptance range is 80-120% for soils MS acceptance range 75-125% for soils													
QA/QC Batch 547774 (Degree F), QC Sample No: CG86956 (CG87685)													
Flash Point			135	129	NC	101						75 - 125	30
Comment: Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 547652 (PH), QC Sample No: CG87488 (CG87685, CG87692, CG87695)													
pH at 25C - Soil			7.34	7.46	1.60	101						85 - 115	20
QA/QC Batch 547775 (Degree F), QC Sample No: CG87692 (CG87692, CG87695)													
Flash Point			>200	>200	NC	101						75 - 125	30
Comment: Additional criteria matrix spike acceptance range is 75-125%.													



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QA/QC Report

October 06, 2020

QA/QC Data

SDG I.D.: GCG87683

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
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QA/QC Batch 547592 (mg/Kg), QC Sample No: CG87685 (CG87685, CG87692, CG87695)

TPH by GC (Extractable Products) - Soil

Ext. Petroleum HC	ND	50	72	77	6.7				30 - 130	30
% n-Pentacosane	39	%	51	59	14.5				50 - 150	30

Comment:

The MS/MSD could not be reported due to the presence of ETPH in the original sample. The LCS was within method criteria.

Additional surrogate criteria: LCS acceptance range is 60-120% MS acceptance range 50-150%. The ETPH/DRO LCS has been normalized based on the alkane calibration.

QA/QC Batch 547682 (ug/L), QC Sample No: CG87504 10X (CG87685, CG87692, CG87695)

Chlorinated Herbicides

2,4,5-TP (Silvex)	ND	2.5	91	90	1.1				40 - 140	20
2,4-D	ND	5.0	92	92	0.0				40 - 140	20
% DCAA (Surrogate Rec)	87	%	93	94	1.1				30 - 150	20
% DCAA (Surrogate Rec) (Confirm)	91	%	90	91	1.1				30 - 150	20

Comment:

Additional criteria: LCS acceptance range is 40-140% MS acceptance range 30-150%.

QA/QC Batch 547752 (ug/Kg), QC Sample No: CG88240 10X (CG87685, CG87692, CG87695)

Chlorinated Herbicides - Soil

2,4,5-T	ND	130	63	67	6.2	73	63	14.7	40 - 140	30
2,4,5-TP (Silvex)	ND	130	68	73	7.1	78	65	18.2	40 - 140	30
2,4-D	ND	250	70	77	9.5	85	66	25.2	40 - 140	30
2,4-DB	ND	2500	57	60	5.1	75	64	15.8	40 - 140	30
Dalapon	ND	130	69	76	9.7	40	42	4.9	40 - 140	30
Dicamba	ND	130	77	83	7.5	70	62	12.1	40 - 140	30
Dichloroprop	ND	130	75	66	12.8	73	59	21.2	40 - 140	30
Dinoseb	ND	130	86	93	7.8	90	81	10.5	40 - 140	30
% DCAA (Surrogate Rec)	58	%	51	54	5.7	54	49	9.7	30 - 150	30
% DCAA (Surrogate Rec) (Confirm)	53	%	46	49	6.3	50	45	10.5	30 - 150	30

Comment:

Additional criteria: LCS acceptance range is 40-140% MS acceptance range 30-150%.

QA/QC Batch 547556 (ug/Kg), QC Sample No: CG88217 2X (CG87685, CG87692, CG87695)

Polychlorinated Biphenyls - Soil

PCB-1016	ND	33	77	75	2.6	74	78	5.3	40 - 140	30
PCB-1221	ND	33							40 - 140	30
PCB-1232	ND	33							40 - 140	30
PCB-1242	ND	33							40 - 140	30
PCB-1248	ND	33							40 - 140	30
PCB-1254	ND	33							40 - 140	30
PCB-1260	ND	33	83	79	4.9	78	83	6.2	40 - 140	30
PCB-1262	ND	33							40 - 140	30
PCB-1268	ND	33							40 - 140	30

QA/QC Data

SDG I.D.: GCG87683

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
% DCBP (Surrogate Rec)	69	%	86	85	1.2	79	84	6.1	30 - 150	30
% DCBP (Surrogate Rec) (Confirm	77	%	93	86	7.8	80	83	3.7	30 - 150	30
% TCMX (Surrogate Rec)	62	%	76	80	5.1	80	83	3.7	30 - 150	30
% TCMX (Surrogate Rec) (Confirm	60	%	74	90	19.5	90	91	1.1	30 - 150	30

QA/QC Batch 547807 (ug/L), QC Sample No: CG87557 10X (CG87685, CG87692, CG87695)

Pesticides

4,4' -DDD	ND	0.25	94	101	7.2	98			40 - 140	20
4,4' -DDE	ND	0.25	74	83	11.5	82			40 - 140	20
4,4' -DDT	ND	0.25	81	78	3.8	91			40 - 140	20
a-BHC	ND	0.15	83	78	6.2	93			40 - 140	20
Alachlor	ND	0.50	NA	NA	NC	NA			40 - 140	20
Aldrin	ND	0.15	81	86	6.0	86			40 - 140	20
b-BHC	ND	0.15	127	127	0.0	139			40 - 140	20
Chlordane	ND	5.0	81	83	2.4	89			40 - 140	20
d-BHC	ND	0.50	93	100	7.3	103			40 - 140	20
Dieldrin	ND	0.15	83	87	4.7	93			40 - 140	20
Endosulfan I	ND	0.50	90	89	1.1	100			40 - 140	20
Endosulfan II	ND	0.50	91	102	11.4	99			40 - 140	20
Endosulfan sulfate	ND	0.50	104	124	17.5	115			40 - 140	20
Endrin	ND	0.50	85	87	2.3	96			40 - 140	20
Endrin aldehyde	ND	0.50	108	129	17.7	120			40 - 140	20
g-BHC	ND	0.15	88	84	4.7	96			40 - 140	20
Heptachlor	ND	0.50	82	86	4.8	90			40 - 140	20
Heptachlor epoxide	ND	0.50	84	88	4.7	94			40 - 140	20
Methoxychlor	ND	0.50	92	100	8.3	101			40 - 140	20
Toxaphene	ND	20	NA	NA	NC	NA			40 - 140	20
% DCBP	110	%	101	99	2.0	83			30 - 150	20
% DCBP (Confirmation)	114	%	88	113	24.9	77			30 - 150	20
% TCMX	94	%	85	77	9.9	93			30 - 150	20
% TCMX (Confirmation)	92	%	70	94	29.3	81			30 - 150	20

QA/QC Batch 547557 (ug/Kg), QC Sample No: CG88217 2X (CG87685, CG87692, CG87695)

Pesticides - Soil

4,4' -DDD	ND	1.7	74	78	5.3	82	72	13.0	40 - 140	30
4,4' -DDE	ND	1.7	60	65	8.0	68	60	12.5	40 - 140	30
4,4' -DDT	ND	1.7	65	69	6.0	107	90	17.3	40 - 140	30
a-BHC	ND	1.0	61	69	12.3	66	61	7.9	40 - 140	30
a-Chlordane	ND	3.3	64	67	4.6	77	69	11.0	40 - 140	30
Aldrin	ND	1.0	59	64	8.1	66	62	6.3	40 - 140	30
b-BHC	ND	1.0	95	105	10.0	127	131	3.1	40 - 140	30
Chlordane	ND	3.3	64	67	4.6	70	62	12.1	40 - 140	30
d-BHC	ND	3.3	69	74	7.0	72	65	10.2	40 - 140	30
Dieldrin	ND	1.0	67	69	2.9	67	59	12.7	40 - 140	30
Endosulfan I	ND	3.3	72	73	1.4	66	55	18.2	40 - 140	30
Endosulfan II	ND	3.3	71	75	5.5	67	60	11.0	40 - 140	30
Endosulfan sulfate	ND	3.3	84	90	6.9	82	66	21.6	40 - 140	30
Endrin	ND	3.3	65	69	6.0	68	61	10.9	40 - 140	30
Endrin aldehyde	ND	3.3	76	79	3.9	78	68	13.7	40 - 140	30
Endrin ketone	ND	3.3	77	80	3.8	77	68	12.4	40 - 140	30
g-BHC	ND	1.0	65	72	10.2	66	59	11.2	40 - 140	30
g-Chlordane	ND	3.3	64	67	4.6	70	62	12.1	40 - 140	30
Heptachlor	ND	3.3	60	67	11.0	67	63	6.2	40 - 140	30
Heptachlor epoxide	ND	3.3	67	71	5.8	60	56	6.9	40 - 140	30

QA/QC Data

SDG I.D.: GCG87683

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								
Methoxychlor	ND	3.3	72	75	4.1	65	63	3.1	40 - 140	30
Toxaphene	ND	130	NA	NA	NC	NA	NA	NC	40 - 140	30
% DCBP	64	%	66	70	5.9	65	58	11.4	30 - 150	30
% DCBP (Confirmation)	69	%	67	74	9.9	80	66	19.2	30 - 150	30
% TCMX	62	%	58	69	17.3	73	66	10.1	30 - 150	30
% TCMX (Confirmation)	57	%	50	60	18.2	69	58	17.3	30 - 150	30

QA/QC Batch 547547 (ug/kg), QC Sample No: CG87473 (CG87685, CG87692)

Semivolatiles - Soil

1,1-Biphenyl	ND	230	74	73	1.4	76	78	2.6	40 - 140	30
1,2,4,5-Tetrachlorobenzene	ND	230	71	68	4.3	74	77	4.0	40 - 140	30
2,3,4,6-tetrachlorophenol	ND	230	90	95	5.4	85	84	1.2	30 - 130	30
2,4,5-Trichlorophenol	ND	230	88	93	5.5	84	87	3.5	40 - 140	30
2,4,6-Trichlorophenol	ND	130	86	91	5.6	84	86	2.4	30 - 130	30
2,4-Dichlorophenol	ND	130	75	73	2.7	76	80	5.1	30 - 130	30
2,4-Dimethylphenol	ND	230	74	70	5.6	77	81	5.1	30 - 130	30
2,4-Dinitrophenol	ND	230	41	48	15.7	84	72	15.4	30 - 130	30
2,4-Dinitrotoluene	ND	130	100	109	8.6	92	93	1.1	30 - 130	30
2,6-Dinitrotoluene	ND	130	97	104	7.0	89	93	4.4	40 - 140	30
2-Chloronaphthalene	ND	230	78	78	0.0	79	82	3.7	40 - 140	30
2-Chlorophenol	ND	230	71	56	23.6	74	74	0.0	30 - 130	30
2-Methylnaphthalene	ND	230	69	63	9.1	73	75	2.7	40 - 140	30
2-Methylphenol (o-cresol)	ND	230	74	60	20.9	78	79	1.3	40 - 140	30
2-Nitroaniline	ND	330	144	160	10.5	125	127	1.6	40 - 140	30
2-Nitrophenol	ND	230	72	64	11.8	75	76	1.3	40 - 140	30
3&4-Methylphenol (m&p-cresol)	ND	230	80	68	16.2	79	82	3.7	30 - 130	30
3,3'-Dichlorobenzidine	ND	130	86	97	12.0	76	76	0.0	40 - 140	30
3-Nitroaniline	ND	330	99	108	8.7	83	85	2.4	40 - 140	30
4,6-Dinitro-2-methylphenol	ND	230	75	91	19.3	103	95	8.1	30 - 130	30
4-Bromophenyl phenyl ether	ND	230	89	99	10.6	83	84	1.2	40 - 140	30
4-Chloro-3-methylphenol	ND	230	84	89	5.8	80	83	3.7	30 - 130	30
4-Chloroaniline	ND	230	73	75	2.7	65	67	3.0	40 - 140	30
4-Chlorophenyl phenyl ether	ND	230	90	98	8.5	85	88	3.5	40 - 140	30
4-Nitroaniline	ND	230	90	97	7.5	84	85	1.2	40 - 140	30
4-Nitrophenol	ND	230	83	90	8.1	81	81	0.0	30 - 130	30
Acenaphthene	ND	230	82	88	7.1	84	84	0.0	30 - 130	30
Acenaphthylene	ND	130	79	81	2.5	82	89	8.2	40 - 140	30
Acetophenone	ND	230	70	59	17.1	71	71	0.0	40 - 140	30
Anthracene	ND	230	85	96	12.2	78	95	19.7	40 - 140	30
Atrazine	ND	130	64	72	11.8	57	60	5.1	40 - 140	30
Benz(a)anthracene	ND	230	92	101	9.3	116	NC	NC	40 - 140	30
Benzaldehyde	ND	230	16	11	37.0	54	52	3.8	40 - 140	30
Benzo(a)pyrene	ND	130	90	99	9.5	NC	NC	NC	40 - 140	30
Benzo(b)fluoranthene	ND	160	110	115	4.4	NC	NC	NC	40 - 140	30
Benzo(ghi)perylene	ND	230	90	100	10.5	NC	NC	NC	40 - 140	30
Benzo(k)fluoranthene	ND	230	67	77	13.9	NC	NC	NC	40 - 140	30
Benzyl butyl phthalate	ND	230	92	99	7.3	84	86	2.4	40 - 140	30
Bis(2-chloroethoxy)methane	ND	230	68	59	14.2	69	71	2.9	40 - 140	30
Bis(2-chloroethyl)ether	ND	130	54	41	27.4	59	59	0.0	40 - 140	30
Bis(2-chloroisopropyl)ether	ND	230	44	35	22.8	46	46	0.0	40 - 140	30
Bis(2-ethylhexyl)phthalate	ND	230	91	97	6.4	82	86	4.8	40 - 140	30
Caprolactam	ND	230	80	85	6.1	72	74	2.7	40 - 140	30
Carbazole	ND	230	88	98	10.8	81	82	1.2	40 - 140	30

QA/QC Data

SDG I.D.: GCG87683

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								
Chrysene	ND	230	91	99	8.4	109	NC	NC	40 - 140	30
Dibenz(a,h)anthracene	ND	130	97	106	8.9	80	95	17.1	40 - 140	30
Dibenzofuran	ND	230	83	87	4.7	79	80	1.3	40 - 140	30
Diethyl phthalate	ND	230	90	97	7.5	81	83	2.4	40 - 140	30
Dimethylphthalate	ND	230	90	96	6.5	81	84	3.6	40 - 140	30
Di-n-butylphthalate	ND	670	92	99	7.3	83	85	2.4	40 - 140	30
Di-n-octylphthalate	ND	230	91	98	7.4	83	85	2.4	40 - 140	30
Fluoranthene	ND	230	87	96	9.8	NC	NC	NC	40 - 140	30
Fluorene	ND	230	87	93	6.7	89	89	0.0	40 - 140	30
Hexachlorobenzene	ND	130	90	100	10.5	84	85	1.2	40 - 140	30
Hexachlorobutadiene	ND	230	64	56	13.3	71	74	4.1	40 - 140	30
Hexachlorocyclopentadiene	ND	230	54	43	22.7	23	19	19.0	40 - 140	30
Hexachloroethane	ND	130	53	41	25.5	62	62	0.0	40 - 140	30
Indeno(1,2,3-cd)pyrene	ND	230	89	98	9.6	NC	NC	NC	40 - 140	30
Isophorone	ND	130	65	61	6.3	65	67	3.0	40 - 140	30
Naphthalene	ND	230	65	58	11.4	70	71	1.4	40 - 140	30
Nitrobenzene	ND	130	72	59	19.8	73	74	1.4	40 - 140	30
N-Nitrosodimethylamine	ND	230	42	32	27.0	48	47	2.1	40 - 140	30
N-Nitrosodi-n-propylamine	ND	130	71	58	20.2	69	70	1.4	40 - 140	30
N-Nitrosodiphenylamine	ND	130	89	97	8.6	83	85	2.4	40 - 140	30
Pentachlorophenol	ND	230	86	87	1.2	81	86	6.0	30 - 130	30
Phenanthrene	ND	130	85	94	10.1	NC	NC	NC	40 - 140	30
Phenol	ND	230	76	60	23.5	78	77	1.3	30 - 130	30
Pyrene	ND	230	89	99	10.6	NC	NC	NC	30 - 130	30
% 2,4,6-Tribromophenol	89	%	88	101	13.8	82	88	7.1	30 - 130	30
% 2-Fluorobiphenyl	80	%	77	74	4.0	75	78	3.9	30 - 130	30
% 2-Fluorophenol	77	%	62	47	27.5	64	66	3.1	30 - 130	30
% Nitrobenzene-d5	79	%	67	55	19.7	69	71	2.9	30 - 130	30
% Phenol-d5	80	%	71	55	25.4	71	72	1.4	30 - 130	30
% Terphenyl-d14	99	%	101	109	7.6	90	93	3.3	30 - 130	30

Comment:

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

QA/QC Batch 547738 (ug/L), QC Sample No: CG87558 (CG87685, CG87692, CG87695)

Semivolatiles - TCLP

1,4-Dichlorobenzene	ND	17	56	61	8.5	57			40 - 140	20
2,4,5-Trichlorophenol	ND	17	79	89	11.9	80			40 - 140	20
2,4,6-Trichlorophenol	ND	17	78	86	9.8	79			30 - 130	20
2,4-Dinitrotoluene	ND	58	89	98	9.6	89			30 - 130	20
2-Methylphenol (o-cresol)	ND	17	66	72	8.7	71			40 - 140	20
3&4-Methylphenol (m&p-cresol)	ND	17	61	74	19.3	69			30 - 130	20
Hexachlorobenzene	ND	58	81	95	15.9	85			40 - 140	20
Hexachlorobutadiene	ND	58	71	79	10.7	71			40 - 140	20
Hexachloroethane	ND	58	57	62	8.4	57			40 - 140	20
Nitrobenzene	ND	58	59	70	17.1	65			40 - 140	20
Pentachlorophenol	ND	58	61	87	35.1	80			30 - 130	20
Pyridine	ND	83	54	59	8.8	54			40 - 140	20
% 2,4,6-Tribromophenol	82	%	82	87	5.9	80			15 - 110	20
% 2-Fluorobiphenyl	78	%	72	75	4.1	68			30 - 130	20
% 2-Fluorophenol	59	%	48	51	6.1	47			15 - 110	20
% Nitrobenzene-d5	73	%	57	69	19.0	62			30 - 130	20
% Phenol-d5	56	%	47	52	10.1	48			15 - 110	20

QA/QC Data

SDG I.D.: GCG87683

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
% Terphenyl-d14	87	%	91	94	3.2	85			30 - 130	20

Comment:

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

QA/QC Batch 547548 (ug/kg), QC Sample No: CG87695 (CG87695)

Semivolatiles - Soil

1,1-Biphenyl	ND	230	84	87	3.5	79	82	3.7	40 - 140	30
1,2,4,5-Tetrachlorobenzene	ND	230	76	83	8.8	77	78	1.3	40 - 140	30
2,3,4,6-tetrachlorophenol	ND	230	87	95	8.8	85	87	2.3	30 - 130	30
2,4,5-Trichlorophenol	ND	230	90	96	6.5	84	89	5.8	40 - 140	30
2,4,6-Trichlorophenol	ND	130	90	99	9.5	86	90	4.5	30 - 130	30
2,4-Dichlorophenol	ND	130	80	91	12.9	82	84	2.4	30 - 130	30
2,4-Dimethylphenol	ND	230	77	84	8.7	74	77	4.0	30 - 130	30
2,4-Dinitrophenol	ND	230	36	84	80.0	58	55	5.3	30 - 130	30
2,4-Dinitrotoluene	ND	130	95	101	6.1	88	89	1.1	30 - 130	30
2,6-Dinitrotoluene	ND	130	91	98	7.4	84	88	4.7	40 - 140	30
2-Chloronaphthalene	ND	230	87	91	4.5	80	84	4.9	40 - 140	30
2-Chlorophenol	ND	230	70	92	27.2	79	81	2.5	30 - 130	30
2-Methylnaphthalene	ND	230	74	80	7.8	74	76	2.7	40 - 140	30
2-Methylphenol (o-cresol)	ND	230	65	95	37.5	79	81	2.5	40 - 140	30
2-Nitroaniline	ND	330	111	129	15.0	107	113	5.5	40 - 140	30
2-Nitrophenol	ND	230	82	96	15.7	83	93	11.4	40 - 140	30
3&4-Methylphenol (m&p-cresol)	ND	230	69	98	34.7	78	81	3.8	30 - 130	30
3,3'-Dichlorobenzidine	ND	130	91	73	22.0	54	48	11.8	40 - 140	30
3-Nitroaniline	ND	330	91	83	9.2	70	80	13.3	40 - 140	30
4,6-Dinitro-2-methylphenol	ND	230	69	102	38.6	83	78	6.2	30 - 130	30
4-Bromophenyl phenyl ether	ND	230	90	96	6.5	79	86	8.5	40 - 140	30
4-Chloro-3-methylphenol	ND	230	80	90	11.8	81	82	1.2	30 - 130	30
4-Chloroaniline	ND	230	81	55	38.2	51	61	17.9	40 - 140	30
4-Chlorophenyl phenyl ether	ND	230	92	93	1.1	84	87	3.5	40 - 140	30
4-Nitroaniline	ND	230	88	95	7.7	82	89	8.2	40 - 140	30
4-Nitrophenol	ND	230	90	100	10.5	88	91	3.4	30 - 130	30
Acenaphthene	ND	230	91	94	3.2	84	89	5.8	30 - 130	30
Acenaphthylene	ND	130	86	87	1.2	77	83	7.5	40 - 140	30
Acetophenone	ND	230	67	87	26.0	75	78	3.9	40 - 140	30
Anthracene	ND	230	90	91	1.1	77	85	9.9	40 - 140	30
Atrazine	ND	130	64	67	4.6	55	57	3.6	40 - 140	30
Benz(a)anthracene	ND	230	92	94	2.2	73	91	22.0	40 - 140	30
Benzaldehyde	ND	230	29	65	76.6	109	127	15.3	40 - 140	30
Benzo(a)pyrene	ND	130	88	92	4.4	68	87	24.5	40 - 140	30
Benzo(b)fluoranthene	ND	160	104	109	4.7	89	111	22.0	40 - 140	30
Benzo(ghi)perylene	ND	230	87	87	0.0	71	83	15.6	40 - 140	30
Benzo(k)fluoranthene	ND	230	70	68	2.9	54	64	16.9	40 - 140	30
Benzyl butyl phthalate	ND	230	93	97	4.2	81	83	2.4	40 - 140	30
Bis(2-chloroethoxy)methane	ND	230	76	83	8.8	75	78	3.9	40 - 140	30
Bis(2-chloroethyl)ether	ND	130	67	75	11.3	71	76	6.8	40 - 140	30
Bis(2-chloroisopropyl)ether	ND	230	48	64	28.6	55	59	7.0	40 - 140	30
Bis(2-ethylhexyl)phthalate	ND	230	99	100	1.0	84	89	5.8	40 - 140	30
Caprolactam	ND	230	73	87	17.5	70	78	10.8	40 - 140	30
Carbazole	ND	230	91	91	0.0	83	86	3.6	40 - 140	30
Chrysene	ND	230	94	97	3.1	74	98	27.9	40 - 140	30
Dibenz(a,h)anthracene	ND	130	88	89	1.1	78	84	7.4	40 - 140	30

QA/QC Data

SDG I.D.: GCG87683

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
	Blank	RL									
Dibenzofuran	ND	230	92	90	2.2	83	87	4.7	40 - 140	30	
Diethyl phthalate	ND	230	94	97	3.1	85	89	4.6	40 - 140	30	
Dimethylphthalate	ND	230	94	97	3.1	85	89	4.6	40 - 140	30	
Di-n-butylphthalate	ND	670	97	94	3.1	81	82	1.2	40 - 140	30	
Di-n-octylphthalate	ND	230	95	100	5.1	79	83	4.9	40 - 140	30	
Fluoranthene	ND	230	90	86	4.5	63	89	34.2	40 - 140	30	r
Fluorene	ND	230	89	91	2.2	80	85	6.1	40 - 140	30	
Hexachlorobenzene	ND	130	89	92	3.3	81	86	6.0	40 - 140	30	
Hexachlorobutadiene	ND	230	75	84	11.3	79	81	2.5	40 - 140	30	
Hexachlorocyclopentadiene	ND	230	61	73	17.9	30	<10	NC	40 - 140	30	m
Hexachloroethane	ND	130	65	76	15.6	71	67	5.8	40 - 140	30	
Indeno(1,2,3-cd)pyrene	ND	230	83	87	4.7	66	80	19.2	40 - 140	30	
Isophorone	ND	130	70	78	10.8	70	73	4.2	40 - 140	30	
Naphthalene	ND	230	76	82	7.6	77	80	3.8	40 - 140	30	
Nitrobenzene	ND	130	67	87	26.0	77	78	1.3	40 - 140	30	
N-Nitrosodimethylamine	ND	230	60	70	15.4	61	61	0.0	40 - 140	30	
N-Nitrosodi-n-propylamine	ND	130	67	90	29.3	76	79	3.9	40 - 140	30	
N-Nitrosodiphenylamine	ND	130	89	92	3.3	82	85	3.6	40 - 140	30	
Pentachlorophenol	ND	230	70	96	31.3	85	92	7.9	30 - 130	30	r
Phenanthrene	ND	130	92	92	0.0	71	98	32.0	40 - 140	30	r
Phenol	ND	230	77	97	23.0	83	86	3.6	30 - 130	30	
Pyrene	ND	230	89	84	5.8	61	87	35.1	30 - 130	30	r
% 2,4,6-Tribromophenol	83	%	89	96	7.6	80	85	6.1	30 - 130	30	
% 2-Fluorobiphenyl	85	%	86	87	1.2	78	82	5.0	30 - 130	30	
% 2-Fluorophenol	71	%	63	84	28.6	69	72	4.3	30 - 130	30	
% Nitrobenzene-d5	75	%	64	86	29.3	74	75	1.3	30 - 130	30	
% Phenol-d5	72	%	67	89	28.2	74	77	4.0	30 - 130	30	
% Terphenyl-d14	85	%	96	96	0.0	81	81	0.0	30 - 130	30	

Comment:

Additional 8270 criteria: 20% of compounds can be outside of acceptance criteria as long as recovery is at least 10%. (Acid surrogates acceptance range for aqueous samples: 15-110%, for soils 30-130%)

QA/QC Batch 547895H (ug/kg), QC Sample No: CG87408 50X (CG87683 (50X) , CG87684 (50X))

Volatiles - Soil (High Level)

1,1,2,2-Tetrachloroethane	ND	250	106	111	4.6	93	104	11.2	70 - 130	30	
1,2,3-Trichlorobenzene	ND	250	115	122	5.9	90	106	16.3	70 - 130	30	
1,2,4-Trichlorobenzene	ND	250	114	121	6.0	95	108	12.8	70 - 130	30	
1,2-Dibromo-3-chloropropane	ND	250	97	104	7.0	75	92	20.4	70 - 130	30	
1,2-Dichlorobenzene	ND	250	103	110	6.6	NC	NC	NC	70 - 130	30	
1,3-Dichlorobenzene	ND	250	104	109	4.7	92	101	9.3	70 - 130	30	
1,4-Dichlorobenzene	ND	250	103	111	7.5	94	103	9.1	70 - 130	30	
Isopropylbenzene	ND	250	102	111	8.5	91	103	12.4	70 - 130	30	
% 1,2-dichlorobenzene-d4	95	%	101	102	1.0	100	101	1.0	70 - 130	30	
% Bromofluorobenzene	100	%	100	97	3.0	102	101	1.0	70 - 130	30	
% Dibromofluoromethane	98	%	91	99	8.4	100	97	3.0	70 - 130	30	
% Toluene-d8	95	%	103	103	0.0	101	102	1.0	70 - 130	30	

Comment:

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%, 25-160% for Chloroethane-HL and Trichlorofluoromethane-HL.

QA/QC Batch 547917 (ug/L), QC Sample No: CG87685 (CG87685 (10X) , CG87692 (10X) , CG87695 (10X))

Volatiles - TCLP

1,1-Dichloroethene	ND	5.0	99	98	1.0	106	107	0.9	70 - 130	30	
1,2-Dichloroethane	ND	0.60	93	97	4.2	98	100	2.0	70 - 130	30	

QA/QC Data

SDG I.D.: GCG87683

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								
Benzene	ND	0.70	98	100	2.0	104	107	2.8	70 - 130	30
Carbon tetrachloride	ND	5.0	99	99	0.0	107	109	1.9	70 - 130	30
Chlorobenzene	ND	1.0	96	99	3.1	102	107	4.8	70 - 130	30
Chloroform	ND	5.0	96	99	3.1	102	106	3.8	70 - 130	30
Methyl ethyl ketone	ND	5.0	91	99	8.4	92	94	2.2	70 - 130	30
Tetrachloroethene	ND	1.0	93	98	5.2	101	104	2.9	70 - 130	30
Trichloroethene	ND	5.0	95	94	1.1	101	102	1.0	70 - 130	30
Vinyl chloride	ND	5.0	102	103	1.0	110	113	2.7	70 - 130	30
% 1,2-dichlorobenzene-d4	102	%	98	98	0.0	103	100	3.0	70 - 130	30
% Bromofluorobenzene	98	%	100	101	1.0	99	103	4.0	70 - 130	30
% Dibromofluoromethane	100	%	95	98	3.1	101	95	6.1	70 - 130	30
% Toluene-d8	101	%	101	101	0.0	99	100	1.0	70 - 130	30

Comment:

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%, 25-160% for Chloroethane-HL and Trichlorofluoromethane-HL.

QA/QC Batch 547716 (ug/kg), QC Sample No: CG88485 (CG87683, CG87684, CG87686, CG87687, CG87688, CG87689, CG87690, CG87691, CG87693, CG87694, CG87696)

Volatiles - Soil (Low Level)

1,1,1-Trichloroethane	ND	5.0	105	102	2.9	106	100	5.8	70 - 130	30
1,1,2,2-Tetrachloroethane	ND	3.0	111	100	10.4	110	109	0.9	70 - 130	30
1,1,2-Trichloroethane	ND	5.0	104	98	5.9	100	99	1.0	70 - 130	30
1,1-Dichloroethane	ND	5.0	105	96	9.0	103	98	5.0	70 - 130	30
1,1-Dichloroethene	ND	5.0	107	104	2.8	105	102	2.9	70 - 130	30
1,2,3-Trichlorobenzene	ND	5.0	105	97	7.9	93	86	7.8	70 - 130	30
1,2,4-Trichlorobenzene	ND	5.0	104	97	7.0	94	87	7.7	70 - 130	30
1,2-Dibromo-3-chloropropane	ND	5.0	113	101	11.2	106	111	4.6	70 - 130	30
1,2-Dibromoethane	ND	5.0	106	98	7.8	101	102	1.0	70 - 130	30
1,2-Dichlorobenzene	ND	5.0	102	95	7.1	96	94	2.1	70 - 130	30
1,2-Dichloroethane	ND	5.0	107	97	9.8	100	99	1.0	70 - 130	30
1,2-Dichloropropane	ND	5.0	107	102	4.8	103	102	1.0	70 - 130	30
1,3-Dichlorobenzene	ND	5.0	102	97	5.0	99	93	6.3	70 - 130	30
1,4-Dichlorobenzene	ND	5.0	99	93	6.3	95	91	4.3	70 - 130	30
1,4-dioxane	ND	100	126	114	10.0	108	111	2.7	70 - 130	30
2-Hexanone	ND	25	153	128	17.8	92	94	2.2	70 - 130	30
4-Methyl-2-pentanone	ND	25	113	101	11.2	100	102	2.0	70 - 130	30
Acetone	ND	10	156	127	20.5	59	62	5.0	70 - 130	30
Benzene	ND	1.0	105	102	2.9	101	99	2.0	70 - 130	30
Bromochloromethane	ND	5.0	107	98	8.8	103	98	5.0	70 - 130	30
Bromodichloromethane	ND	5.0	110	104	5.6	106	104	1.9	70 - 130	30
Bromoform	ND	5.0	113	103	9.3	105	106	0.9	70 - 130	30
Bromomethane	ND	5.0	103	100	3.0	110	97	12.6	70 - 130	30
Carbon Disulfide	ND	5.0	115	111	3.5	110	104	5.6	70 - 130	30
Carbon tetrachloride	ND	5.0	110	105	4.7	107	104	2.8	70 - 130	30
Chlorobenzene	ND	5.0	103	98	5.0	102	98	4.0	70 - 130	30
Chloroethane	ND	5.0	107	104	2.8	108	98	9.7	70 - 130	30
Chloroform	ND	5.0	106	98	7.8	104	100	3.9	70 - 130	30
Chloromethane	ND	5.0	96	90	6.5	93	88	5.5	70 - 130	30
cis-1,2-Dichloroethene	ND	5.0	100	91	9.4	96	93	3.2	70 - 130	30
cis-1,3-Dichloropropene	ND	5.0	113	108	4.5	104	102	1.9	70 - 130	30
Cyclohexane	ND	5.0	102	98	4.0	100	97	3.0	70 - 130	30
Dibromochloromethane	ND	3.0	124	116	6.7	116	119	2.6	70 - 130	30
Dichlorodifluoromethane	ND	5.0	103	98	5.0	99	98	1.0	70 - 130	30

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QA/QC Data

SDG I.D.: GCG87683

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
	Blank	RL								
Ethylbenzene	ND	1.0	105	101	3.9	103	99	4.0	70 - 130	30
Isopropylbenzene	ND	1.0	105	100	4.9	105	103	1.9	70 - 130	30
m&p-Xylene	ND	2.0	103	99	4.0	101	99	2.0	70 - 130	30
Methyl ethyl ketone	ND	5.0	175	140	22.2	88	87	1.1	70 - 130	30
Methyl t-butyl ether (MTBE)	ND	1.0	104	91	13.3	97	95	2.1	70 - 130	30
Methylacetate	ND	5.0	101	88	13.8	111	109	1.8	70 - 130	30
Methylcyclohexane	ND	5.0	113	110	2.7	111	111	0.0	70 - 130	30
Methylene chloride	ND	5.0	94	87	7.7	93	89	4.4	70 - 130	30
o-Xylene	ND	2.0	104	100	3.9	103	100	3.0	70 - 130	30
Styrene	ND	5.0	104	98	5.9	98	93	5.2	70 - 130	30
Tetrachloroethene	ND	5.0	103	101	2.0	101	99	2.0	70 - 130	30
Toluene	ND	1.0	105	101	3.9	100	98	2.0	70 - 130	30
trans-1,2-Dichloroethene	ND	5.0	116	109	6.2	107	104	2.8	70 - 130	30
trans-1,3-Dichloropropene	ND	5.0	119	112	6.1	107	106	0.9	70 - 130	30
Trichloroethene	ND	5.0	103	100	3.0	100	97	3.0	70 - 130	30
Trichlorofluoromethane	ND	5.0	105	102	2.9	104	100	3.9	70 - 130	30
Trichlorotrifluoroethane	ND	5.0	110	104	5.6	107	104	2.8	70 - 130	30
Vinyl chloride	ND	5.0	107	99	7.8	103	97	6.0	70 - 130	30
% 1,2-dichlorobenzene-d4	101	%	100	101	1.0	99	100	1.0	70 - 130	30
% Bromofluorobenzene	96	%	100	101	1.0	100	101	1.0	70 - 130	30
% Dibromofluoromethane	97	%	105	103	1.9	102	101	1.0	70 - 130	30
% Toluene-d8	98	%	101	102	1.0	99	100	1.0	70 - 130	30

Comment:

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%, 25-160% for Chloroethane-HL and Trichlorofluoromethane-HL.

QA/QC Batch 547716H (ug/kg), QC Sample No: CG88485 50X (CG87697 (50X))

Volatiles - Soil (High Level)

1,1,1-Trichloroethane	ND	250	106	109	2.8	103	104	1.0	70 - 130	30
1,1,2,2-Tetrachloroethane	ND	250	111	113	1.8	104	105	1.0	70 - 130	30
1,1,2-Trichloroethane	ND	250	104	104	0.0	99	100	1.0	70 - 130	30
1,1-Dichloroethane	ND	250	102	103	1.0	100	102	2.0	70 - 130	30
1,1-Dichloroethene	ND	250	107	113	5.5	102	103	1.0	70 - 130	30
1,2,3-Trichlorobenzene	ND	250	118	118	0.0	103	108	4.7	70 - 130	30
1,2,4-Trichlorobenzene	ND	250	122	123	0.8	103	109	5.7	70 - 130	30
1,2-Dibromo-3-chloropropane	ND	250	117	116	0.9	102	108	5.7	70 - 130	30
1,2-Dibromoethane	ND	250	106	108	1.9	101	103	2.0	70 - 130	30
1,2-Dichlorobenzene	ND	250	106	107	0.9	99	100	1.0	70 - 130	30
1,2-Dichloroethane	ND	250	105	105	0.0	99	101	2.0	70 - 130	30
1,2-Dichloropropane	ND	250	109	109	0.0	103	104	1.0	70 - 130	30
1,3-Dichlorobenzene	ND	250	112	111	0.9	102	105	2.9	70 - 130	30
1,4-Dichlorobenzene	ND	250	108	108	0.0	99	101	2.0	70 - 130	30
1,4-dioxane	ND	5000	117	121	3.4	109	110	0.9	70 - 130	30
2-Hexanone	ND	1300	133	127	4.6	91	94	3.2	70 - 130	30
4-Methyl-2-pentanone	ND	1300	106	106	0.0	95	99	4.1	70 - 130	30
Acetone	ND	500	123	109	12.1	56	67	17.9	70 - 130	30
Benzene	ND	250	108	109	0.9	102	105	2.9	70 - 130	30
Bromochloromethane	ND	250	103	105	1.9	100	101	1.0	70 - 130	30
Bromodichloromethane	ND	250	108	106	1.9	101	102	1.0	70 - 130	30
Bromoform	ND	250	104	106	1.9	95	99	4.1	70 - 130	30
Bromomethane	ND	250	69	75	8.3	66	69	4.4	70 - 130	30
Carbon Disulfide	ND	250	113	114	0.9	103	106	2.9	70 - 130	30
Carbon tetrachloride	ND	250	107	108	0.9	98	103	5.0	70 - 130	30

QA/QC Data

SDG I.D.: GCG87683

Parameter	Blk		LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
	Blank	RL									
Chlorobenzene	ND	250	107	109	1.9	104	104	0.0	70 - 130	30	
Chloroethane	ND	250	33	34	3.0	33	34	3.0	70 - 130	30	l,m
Chloroform	ND	250	94	105	11.1	100	103	3.0	70 - 130	30	
Chloromethane	ND	250	103	102	1.0	94	94	0.0	70 - 130	30	
cis-1,2-Dichloroethene	ND	250	98	100	2.0	95	95	0.0	70 - 130	30	
cis-1,3-Dichloropropene	ND	250	112	112	0.0	101	103	2.0	70 - 130	30	
Cyclohexane	ND	250	106	107	0.9	100	102	2.0	70 - 130	30	
Dibromochloromethane	ND	150	118	120	1.7	109	111	1.8	70 - 130	30	
Dichlorodifluoromethane	ND	250	104	106	1.9	99	101	2.0	70 - 130	30	
Ethylbenzene	ND	250	110	110	0.0	107	107	0.0	70 - 130	30	
Isopropylbenzene	ND	250	111	111	0.0	106	107	0.9	70 - 130	30	
m&p-Xylene	ND	250	109	110	0.9	104	106	1.9	70 - 130	30	
Methyl ethyl ketone	ND	250	154	138	11.0	92	92	0.0	70 - 130	30	l
Methyl t-butyl ether (MTBE)	ND	250	100	101	1.0	94	96	2.1	70 - 130	30	
Methylacetate	ND	250	108	107	0.9	98	102	4.0	70 - 130	30	
Methylcyclohexane	ND	250	121	122	0.8	115	119	3.4	70 - 130	30	
Methylene chloride	ND	250	93	92	1.1	86	86	0.0	70 - 130	30	
o-Xylene	ND	250	109	109	0.0	105	106	0.9	70 - 130	30	
Styrene	ND	250	109	110	0.9	105	105	0.0	70 - 130	30	
Tetrachloroethene	ND	250	114	111	2.7	105	107	1.9	70 - 130	30	
Toluene	ND	250	110	111	0.9	104	107	2.8	70 - 130	30	
trans-1,2-Dichloroethene	ND	250	115	116	0.9	110	114	3.6	70 - 130	30	
trans-1,3-Dichloropropene	ND	250	117	116	0.9	104	107	2.8	70 - 130	30	
Trichloroethene	ND	250	110	108	1.8	100	103	3.0	70 - 130	30	
Trichlorofluoromethane	ND	250	26	26	0.0	26	27	3.8	70 - 130	30	l,m
Trichlorotrifluoroethane	ND	250	114	115	0.9	107	111	3.7	70 - 130	30	
Vinyl chloride	ND	250	121	123	1.6	112	117	4.4	70 - 130	30	
% 1,2-dichlorobenzene-d4	101	%	101	100	1.0	100	99	1.0	70 - 130	30	
% Bromofluorobenzene	95	%	99	100	1.0	102	100	2.0	70 - 130	30	
% Dibromofluoromethane	101	%	104	102	1.9	96	96	0.0	70 - 130	30	
% Toluene-d8	98	%	102	100	2.0	99	100	1.0	70 - 130	30	

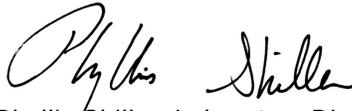
Comment:

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%, 25-160% for Chloroethane-HL and Trichlorofluoromethane-HL.

- l = This parameter is outside laboratory LCS/LCSD specified recovery limits.
- m = This parameter is outside laboratory MS/MSD specified recovery limits.
- r = This parameter is outside laboratory RPD specified recovery limits.
- s = This parameter is outside laboratory Blank Surrogate specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

- RPD - Relative Percent Difference
- LCS - Laboratory Control Sample
- LCSD - Laboratory Control Sample Duplicate
- MS - Matrix Spike
- MS Dup - Matrix Spike Duplicate
- NC - No Criteria
- Intf - Interference


 Phyllis Shiller, Laboratory Director
 October 06, 2020

Tuesday, October 06, 2020

Criteria: NY: 375

State: NY

Sample Criteria Exceedances Report

GCG87683 - BERK-ENV

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
CG87685	\$8270_TCLR	Indeno(1,2,3-cd)pyrene	NY / 375-6.8 Semivolatiles / Unrestricted Use Soil	640	240	500	500	ug/Kg
CG87692	\$PESTSM_NY	4,4' -DDT	NY / 375-6.8 PCBs/Pesticides / Unrestricted Use Soil	5.1	2.2	3.3	3.3	ug/Kg
CG87692	\$PESTSM_NY	4,4' -DDE	NY / 375-6.8 PCBs/Pesticides / Unrestricted Use Soil	4.7	2.2	3.3	3.3	ug/Kg
CG87695	\$8270_TCLR	Indeno(1,2,3-cd)pyrene	NY / 375-6.8 Semivolatiles / Unrestricted Use Soil	800	260	500	500	ug/Kg
CG87695	\$8270_TCLR	Chrysene	NY / 375-6.8 Semivolatiles / Unrestricted Use Soil	1100	260	1000	1000	ug/Kg
CG87695	\$8270_TCLR	Benzo(k)fluoranthene	NY / 375-6.8 Semivolatiles / Unrestricted Use Soil	990	260	800	800	ug/Kg
CG87695	\$PESTSM_NY	4,4' -DDT	NY / 375-6.8 PCBs/Pesticides / Unrestricted Use Soil	9.9	2.2	3.3	3.3	ug/Kg
CG87695	\$PESTSM_NY	4,4' -DDE	NY / 375-6.8 PCBs/Pesticides / Unrestricted Use Soil	9.6	2.2	3.3	3.3	ug/Kg
CG87695	\$PESTSM_NY	4,4' -DDD	NY / 375-6.8 PCBs/Pesticides / Unrestricted Use Soil	4.4	2.2	3.3	3.3	ug/Kg
CG87697	\$8260_TCL_S	Vinyl chloride	NY / 375-6.8 Volatiles / Unrestricted Use Soil	ND	25	20	20	ug/kg
CG87697	\$8260_TCL_S	Methylene chloride	NY / 375-6.8 Volatiles / Unrestricted Use Soil	ND	100	50	50	ug/kg
CG87697	\$8260_TCL_S	Acetone	NY / 375-6.8 Volatiles / Unrestricted Use Soil	ND	250	50	50	ug/kg
CG87697	\$8260_TCL_S	1,2-Dichloroethane	NY / 375-6.8 Volatiles / Unrestricted Use Soil	ND	25	20	20	ug/kg
CG87697	\$DIOX_SMR	1,4-dioxane	NY / 375-6.8 Volatiles / Unrestricted Use Soil	ND	2000	100	100	ug/kg

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

October 06, 2020

SDG I.D.: GCG87683

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report:

Herbicide Narration

AU-ECD12 10/01/20-1: CG87685, CG87692, CG87695

The following Continuing Calibration compounds did not meet % deviation criteria:

Samples: CG87685, CG87692, CG87695

Preceding CC O01B070 - 2,4,5-T (11) 17%H (15%), Dinoseb 24%H (15%)

Succeeding CC O01B082 - Dalapon (1) 17%H (15%), Dinoseb 17%H (15%)

PEST Narration

AU-ECD4 10/01/20-1: CG87685, CG87695

The following Continuing Calibration compounds did not meet % deviation criteria:

Samples: CG87695

Preceding CC O01A024 - Endrin 23%L (20%)

Succeeding CC O01A038 - Endrin 24%L (20%)

A low "1A" standard was run after the samples to demonstrate capability to detect any compounds outside of the CC acceptance criteria. All reported samples were ND for the affected compounds.

Samples: CG87685

Preceding CC O01A051 - b-BHC 24%L (20%), Endrin 21%L (20%)

Succeeding CC O01A066 - 4,4'-DDT 36%L (20%), b-BHC 24%L (20%), Endrin 32%L (20%), Methoxychlor 32%L (20%)

A low "1A" standard was run after the samples to demonstrate capability to detect any compounds outside of the CC acceptance criteria. All reported samples were ND for the affected compounds.

SVOA Narration

CHEM28 09/30/20-2: CG87692

For 8270 full list, the DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.

For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

The following Initial Calibration compounds did not meet recommended response factors: 2-Nitrophenol 0.073 (0.1), Hexachlorobenzene 0.090 (0.1)

The following Initial Calibration compounds did not meet minimum response factors: None.

The following Continuing Calibration compounds did not meet recommended response factors: 2-Nitrophenol 0.071 (0.1), Hexachlorobenzene 0.088 (0.1)

The following Continuing Calibration compounds did not meet minimum response factors: None.

Up to eight compounds can be outside of ICAL %RSD criteria and up to sixteen compounds can be outside of CCAL %Dev criteria if less than 40%.

CHEM29 09/30/20-1: CG87695



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

October 06, 2020

SDG I.D.: GCG87683

For 8270 full list, the DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.

For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

The following Initial Calibration compounds did not meet recommended response factors: 2-Nitrophenol 0.091 (0.1), Hexachlorobenzene 0.084 (0.1)

The following Initial Calibration compounds did not meet minimum response factors: None.

The following Continuing Calibration compounds did not meet recommended response factors: Hexachlorobenzene 0.085 (0.1)

The following Continuing Calibration compounds did not meet minimum response factors: None.

Up to eight compounds can be outside of ICAL %RSD criteria and up to sixteen compounds can be outside of CCAL %Dev criteria if less than 40%.

CHEM29 10/01/20-1: CG87685, CG87692, CG87695

For 8270 full list, the DDT breakdown and pentachlorophenol & benzidine peak tailing were evaluated in the DFTPP tune and were found to be in control.

For 8270 BN list, benzidine peak tailing was evaluated in the DFTPP tune and was found to be in control.

The following Initial Calibration compounds did not meet recommended response factors: Hexachlorobenzene 0.084 (0.1)

The following Initial Calibration compounds did not meet minimum response factors: None.

The following Continuing Calibration compounds did not meet recommended response factors: Hexachlorobenzene 0.082 (0.1)

The following Continuing Calibration compounds did not meet minimum response factors: None.

Up to eight compounds can be outside of ICAL %RSD criteria and up to sixteen compounds can be outside of CCAL %Dev criteria if less than 40%.

CHEM36 10/01/20-1: CG87685

The following Initial Calibration compounds did not meet recommended response factors: 2-Nitrophenol 0.061 (0.1), Hexachlorobenzene 0.092 (0.1)

The following Initial Calibration compounds did not meet minimum response factors: None.

The following Continuing Calibration compounds did not meet recommended response factors: 2-Nitrophenol 0.066 (0.1), Hexachlorobenzene 0.095 (0.1)

The following Continuing Calibration compounds did not meet minimum response factors: None.

Up to eight compounds can be outside of ICAL %RSD criteria and up to sixteen compounds can be outside of CCAL %Dev criteria if less than 40%.

VOA Narration

CHEM14 10/01/20-1: CG87683, CG87684

The following Initial Calibration compounds did not meet RSD% criteria: 1,2-Dibromo-3-chloropropane 30% (20%)

The following Initial Calibration compounds did not meet maximum RSD% criteria: None.

Up to eight compounds can be outside of ICAL %RSD criteria and up to sixteen compounds can be outside of CCAL %Dev criteria if less than 40%.

CHEM31 09/30/20-2: CG87683, CG87684, CG87686, CG87687, CG87688, CG87689, CG87690, CG87691, CG87693, CG87694, CG87696, CG87697



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Tel. (860) 645-1102 Fax (860) 645-0823



Analysis Comments

October 06, 2020

SDG I.D.: GCG87683

The following Initial Calibration compounds did not meet RSD% criteria: 1,2-Dibromo-3-chloropropane 32% (20%), Acetone 36% (20%), Bromoform 27% (20%), Methylene chloride 21% (20%), trans-1,3-Dichloropropene 23% (20%)

The following Initial Calibration compounds did not meet maximum RSD% criteria: None.

The following Initial Calibration compounds did not meet recommended response factors: Bromoform 0.085 (0.1), Tetrachloroethene 0.163 (0.2)

The following Initial Calibration compounds did not meet minimum response factors: None.

Up to eight compounds can be outside of ICAL %RSD criteria and up to sixteen compounds can be outside of CCAL %Dev criteria if less than 40%.



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823



NY Temperature Narration

October 06, 2020

SDG I.D.: GCG87683

The samples in this delivery group were received at 2.3°C.
(Note acceptance criteria for relevant matrices is above freezing up to 6°C)



NY/NJ CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
 Email: info@phoenixlabs.com Fax (860) 645-0823
 Client Services (860) 645-8726

Coolant: IPK ICE No
 Cooler: Yes No

Temp 91.3°C Pg 2 of 2

Contact Options:

Fax: _____
 Phone: _____
 Email: mprell@best-env.com

Customer: Berkshire Environmental Services & Technology, LLC
 Address: 214 East Elm Street Torrington, CT

Project: WCA
 Report to: MATT PRELLI
 Invoice to: SAME

Project P.O.: 11335-1

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification
 Sampler's Signature: Matthew Prelli Date: 9-29-20

Matrix Code:
 DW=Drinking Water GW=Ground Water SW=Surface Water WW=Waste Water
 RW=Raw Water SE=Sediment SL=Sludge S=Soil SD=Solid W=Wipe
 OIL=Oil B=Bulk L=Liquid

Analysis Request

Vec's 8060	SVOC's 8070 (TCL) w/wg	PCBs 8080 (TCL)	Pesticides 8081	Herbicides 8081	* (TM) Metals 8157	Hexavalent Cr 8157	Cyanide 8157	TPH	Reactive Cyanide 8157	Full TCLP	Soil VOA Vials (+) methanol (2) H ₂ O	GL Soil container (4) oz	GL Soil container (8) oz	40 ml VOA Vial (1) As is (1) HCl	PL As is (1) 250ml (1) 500ml (1) 1000ml	PL H ₂ SO ₄ (1) 250ml (1) 500ml	PL HNO ₃ 250ml	Bacteria Bottle within	Bacteria Bottle as is
87094	B-4/0-3.5	S	9-29-20	1456	X						3	1							
87095	Comp/B-3,B-4,B-5	S	9-29-20	1526	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
87096	Trip LL	L	9-29-20	0600	X						3								
87097	TB HL																		

Relinquished by: Matthew Prelli Accepted by: [Signature] Date: 9/30/20 Time: 7:45
 [Signature] Date: 9/30/20 Time: 11:54

Turnaround:
 1 Day*
 2 Days*
 3 Days*
 5 Days
 10 Days
 Other
 * SURCHARGE APPLIES

NJ
 Res. Criteria
 Non-Res. Criteria
 Impact to GW Soil Cleanup Criteria
 Impact to GW soil screen Criteria
 GW Criteria

NY
 TOGS GW
 CP-51 SOIL
 375SCO Unrestricted Soil
 375SCO Residential Soil
 375SCO Residential
 375SCO Commercial Soil
 375SCO Industrial Soil
 Subpart 5 DW

Data Format
 Phoenix Std Report
 Excel
 PDF
 GIS/Key
 EQulS
 NJ Hazsite EDD
 NY EZ EDD (ASP)
 Other _____

Data Package
 NJ Reduced Deliv. *
 NY Enhanced (ASP B) *
 Other _____

What State were samples collected?
NY

Comments, Special Requirements or Regulations:
 Site: Westchester County Airport (WCA)
 Harrison, NY.
 * TAL metals -
 Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Hg, K, Mg, Mn, Na, Ni, Pb, Sb, Se, Ti, V, Zn

Andrew Grundy

From: SoilTesting, Inc. <info@soiltestinginc.net>
Sent: Tuesday, December 15, 2020 3:19 PM
To: Andrew Grundy
Cc: eschwarzrock@skylandsengineering.com; James DeAngelis
Subject: 1608-20 B-3 Westchester County Airport- updated groundwater level
Attachments: 1608-20 B-3 Updated 12.14.20.pdf

Mr. Grundy

Please see attached updated B-3 Log including groundwater level observation readings on 12/14/2020. If you have any questions, please contact James DeAngelis directly (james@soiltestinginc.net) .

Thank you,

Colleen Lindholm
Administrative Assistant

SOILTESTING, INC.

90 Donovan Road
Oxford, CT 06478
(203) 262-9328
(203) 264-3414 fax
Mail to: info@soiltestinginc.net

In an effort to save trees, if this correspondence is not sufficient and a hard copy is needed, please let us know via this email address.

SOILTESTING, INC. 90 DONOVAN RD. OXFORD, CT 06478 CT (203) 262-9328 NY (914) 946-4850	CLIENT: D&B Engineers & Arch	SHEET <u>1</u> OF <u>1</u>
	PROJECT NO. G155-1608-20	HOLE NO. B-3
	PROJECT NAME Westchester County Airport	BORING LOCATIONS per Plan
FOREMAN - DRILLER MK/ao	LOCATION Harrison NY	
INSPECTOR	CASING SAMPLER CORE BAR TYPE HSA SS*	OFFSET
GROUND WATER OBSERVATIONS AT <u>11'</u> FT AFTER <u>0</u> HOURS AT <u>7'3"</u> FT <u>10/7/2020</u> AT <u>6'5"</u> FT <u>12/14/2020</u>	SIZE I.D. 3 1/4" 1 3/8" HAMMER WT. 140# BIT HAMMER FALL 30"	DATE START 9/29/20 DATE FINISH 10/1/20 SURFACE ELEV. EI. ±413 GROUND WATER ELEV.: EI. ±405.75

DEPTH	CASING BLOWS PER FOOT	SAMPLE					BLOWS PER 6 IN ON SAMPLER (FORCE ON TUBE)			CORE TIME PER FT (MIN)	DENSITY OR CONSIST	STRATA CHANGE DEPTH	FIELD IDENTIFICATION OF SOIL REMARKS INCL. COLOR, LOSS OF WASH WATER, SEAMS IN ROCK, ETC.
		NO	Type	PEN	REC.	DEPTH @ BOT	0-6	6-12	12-18				
5	1	ss	24"	20"	2'0"	4	16			dry		4" Topsoil; Brn FMC SAND & FC GRAVEL, tr silt (possible fill)	
						40	29			v dense			
	2	ss	24"	18"	4'0"	28	22			dry		SAME	
						14	14			dense			
10	3	ss	24"	18"	6'0"	14	10			dry		SAME	
						10	6			compact			
	4	ss	24"	14"	8'0"	3	4			dry		Brn FM SAND, sm FC gravel, tr silt	
						4	6			loose			
15	5	ss	24"	14"	10'0"	12	14			moist		SAME	
						9	10			compact			
	6	ss	24"	18"	12'0"	3	6			wet		GreyBrn F SAND, sm silt, lit FC gravel	
						11	11			compact			
20	7	ss	18"	14"	16'6"	6	10			wet dense	15'6"		
						24					18'0"	partly decomposed BEDROCK or boulders	
25	8	ss	2"	1"	20'2"	50/2"				wet		partly decomposed BEDROCK	
30	9	ss	4"	4"	25'4"	50/3"				wet		SAME	
35	10	ss	3"	3"	30'3"	50/3"				v dense	30'3"	SAME	
40												E.O.B 30'3"	
												INSTALLED 2" SCH 40 PVC OBSERVATION WELL WITH 16' SCREEN LENGTH TO A DEPTH OF 30' SET CURB BOX AT SURFACE * CME AUTOHAMMER	

NOTE: Subsoil conditions revealed by this investigation represent conditions at specific locations and may not represent conditions at other locations or times.

GROUND SURFACE TO _____ FT. USED _____ CASING THEN _____ CASING TO _____ FT. **HOLE NO. B-3**

A = AUGER UP = UNDISTURBED PISTON T = THINWALL V = VANE TEST
 WOR = WEIGHT OF RODS WOH = WEIGHT OF HAMMER & RODS C = COARSE
 SS = SPLIT TUBE SAMPLER H.S.A. = HOLLOW STEM AUGER M = MEDIUM
 PROPORTIONS USED: TRACE = 0 - 10% LITTLE = 10 - 20% SOME = 20 - 35% AND = 35 - 50% F = FINE

Andrew Grundy

From: Matthew Prelli <mprelli@best-env.com>
Sent: Friday, October 8, 2021 11:07 AM
To: Andrew Grundy; James DeAngelis
Subject: PFAS Analytical Results
Attachments: Lab Report-GCJ13434 Excel WCA-HARRISON NY-1 (2).pdf

Good Morning Andrew:

Following our phone conversation earlier this morning I contacted the laboratory and secured a tabulated report and quickly reviewed the analytical results from the groundwater sampling event conducted on August 25, 2021.

The laboratory results indicate that combined detected concentrations of PFOA (116 ng/L) and PFOS (1.110 ng/L) exceed the EPA Health Advisory Level of 70 ng/L.

The detected concentrations of PFOA + PFOS reported for the duplicate sample also exceeds the applicable criteria.

I have attached the tabulated data table supplied by the laboratory.

If you have any questions or require additional information please contact me at your earliest convenience.

Thanks, Matt

Matthew Prelli
Principal / Project Manager

Berkshire Environmental Services & Technology, LLC
PO Box 1976
214 E. Elm Street
Torrington, Connecticut 06790

Phone: 860.482.6399
Fax: 860.482.1833
Mobile: 860.459.0503
e-mail: mprelli@best-env.com

www.best-env.com

Phoenix Environmental Laboratories, Inc.

587 East Middle Turnpike
P.O. Box 370
Manchester, CT 06040
(860) 645-1102

Lab Sample Id
Collection Date
Client Id
Matrix

CJ13434
8/25/2021
B-3
Ground Water

CJ13435
8/25/2021
DUP
Ground Water

CJ13436
8/25/2021
EQUIPMENT BLANK
Water

CJ13437
8/25/2021
FIELD BLANK
Water

Project Id : WCA-HARRISON NY
PO # : 11427

CAS	Units	CJ13434		CJ13435		CJ13436		CJ13437		
		Result	RL	Result	RL	Result	RL	Result	RL	
PFAS (21) By EPA 537m										
1H,1H,2H,2H-Perfluorodecanesulfonic acid	39108-34-4	ng/L	12	1.56	13.7	2.00	< 2.00	2.00	< 2.00	2.00
1H,1H,2H,2H-Perfluorooctanesulfonic acid	27619-97-2	ng/L	105	3.91	128	5.00	< 5.00	5.00	< 5.00	5.00
NETFOSAA	2991-50-6	ng/L	< 1.56	1.56	< 2.00	2.00	< 2.00	2.00	< 2.00	2.00
NMeFOSAA	2355-31-9	ng/L	< 1.56	1.56	< 2.00	2.00	< 2.00	2.00	< 2.00	2.00
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	ng/L	< 1.56	1.56	< 2.00	2.00	< 2.00	2.00	< 2.00	2.00
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	ng/L	24.7	1.56	28.6	2.00	< 2.00	2.00	< 2.00	2.00
Perfluoro-1-octanesulfonamide (FOSA)	754-91-6	ng/L	< 1.56	1.56	< 2.00	2.00	< 2.00	2.00	< 2.00	2.00
Perfluorobutanesulfonic acid (PFBS)	375-73-5	ng/L	68.8	1.56	82.2	2.00	< 2.00	2.00	< 2.00	2.00
Perfluorodecanoic acid (PFDA)	335-76-2	ng/L	2.3	1.56	2.41	2.00	< 2.00	2.00	< 2.00	2.00
Perfluorododecanoic acid (PFDoA)	307-55-1	ng/L	< 1.56	1.56	< 2.00	2.00	< 2.00	2.00	< 2.00	2.00
Perfluoroheptanoic acid (PFHpA)	375-85-9	ng/L	81.5	15.6	139	2.00	< 2.00	2.00	< 2.00	2.00
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	ng/L	667	15.6	729	20.0	< 2.00	2.00	< 2.00	2.00
Perfluorohexanoic acid (PFHxA)	307-24-4	ng/L	182	15.6	226	20.0	< 2.00	2.00	< 2.00	2.00
Perfluoro-n-butanoic acid (PFBA)	375-22-4	ng/L	68.8	1.56	84.4	2.00	< 2.00	2.00	< 2.00	2.00
Perfluorononanoic acid (PFNA)	375-95-1	ng/L	26	1.56	30.4	2.00	< 2.00	2.00	< 2.00	2.00
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	ng/L	1,110	15.6	1,220	20.0	< 2.00	2.00	< 2.00	2.00
Perfluorooctanoic acid (PFOA)	335-67-1	ng/L	116	15.6	152	20.0	< 2.00	2.00	< 2.00	2.00
Perfluoropentanoic acid (PFPeA)	2706-90-3	ng/L	227	15.6	281	20.0	< 2.00	2.00	< 2.00	2.00
Perfluorotetradecanoic acid (PFTA)	376-06-7	ng/L	< 1.56	1.56	< 2.00	2.00	< 2.00	2.00	< 2.00	2.00
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	ng/L	< 1.56	1.56	< 2.00	2.00	< 2.00	2.00	< 2.00	2.00
Perfluoroundecanoic acid (PFUnA)	2058-94-8	ng/L	< 1.56	1.56	< 2.00	2.00	< 2.00	2.00	< 2.00	2.00

Result Detected



APPENDIX 3

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering

November 16, 2022

Mr. Steven Abbattista, Vice President
OLA Consulting Engineers, P.C.
8 W 38th Street, Suite 501
New York, NY 10018

Re: Environmental Technical Support
Waterline Soil & Groundwater Assessment, New King Street
Water Line Westchester County Airport
240 Airport Road
White Plains, New York

Dear Mr. Abbattista:

At the request of OLA Consulting Engineers, P.C. (OLA), First Environment, Inc. ("First Environment") has prepared the following letter report detailing the execution and results of the Waterline Soil & Groundwater Assessment, January 28, 2022 workplan. The activities included collecting information to gain a better understanding of the water elevations and per- and polyfluoroalkyl substance (PFAS) concentrations in soil and groundwater along the proposed waterline installation. Accordingly, First Environment, on behalf Westchester County, performed temporary well installation and additional soil and groundwater sampling for PFAS.

Actions Taken

On April 19-21, 2022, First Environment executed the scope-of-work to sample soil and groundwater as well as install temporary wells at a total of five locations as illustrated on Figure 1. Prior to initiating any on-site intrusive activities, First Environment engaged American Geophysics of Butler, New Jersey to perform a private utility mark out, while STI, Inc. of Boonton, New Jersey completed the required public utility mark-out and notifications.

The soil samples were composited from the top four feet of soil, immediately below any vegetative or asphaltic cover along proposed waterline location. In total, five soil samples were collected and analyzed for PFAS using York Analytical, a certified laboratory. As noted, the proposed piezometer installation and sampling locations are illustrated on Figure 1. A 7822 track-mounted geoprobe was used to perform drilling at the specified locations. The equipment used to collect samples consisted of steel dual-tube DT-21/22 sampling technology to depths ranging from 10.0 to 15.0 feet below ground surface (bgs). A Macrocore barrel sampler was used with a PVC liner to collect the soil samples continuously as the steel dual-tube casing was advanced. Once the target depth had been

reached, the soil boring was terminated and converted to a temporary monitoring well by installing a temporary one-inch diameter PVC well. The slotted PVC that comprised the screen was positioned to bridge the water table. The soil was classified using the Unified Soil Classification System (USCS) and recorded in a field book by a First Environment geologist. Soil Boring Logs are presented in Appendix A. Furthermore, the soil was field screened using a properly calibrated Photoionization Detector (PID) to assess the presence of volatile organic compounds (VOCs) in the soil. It proved unnecessary to employ a peristaltic pump to reduce turbidity.

A total of five groundwater samples were collected. Once collected, the samples were placed in PFAS free sample bottles and transported to the laboratory following all appropriate sample collection methods of the NYSDEC January 2021 Sampling, Analysis, and Assessment of Per- Polyfluorinated Alkyl Substances. Sampling was conducted as described in First Environment's previously submitted Quality Assurance Project Plan (QAPP). It did not prove necessary to obtain any permits, nor was air monitoring required. The soil sample locations are provided in Figure 1.

Soil Results

Laboratory data from the five composite samples collected (P-1 through P-5) was submitted for Total PFAS analysis and demonstrate the presence of low levels of PFAS material. The detections are below:

Boring	P-1	P-2	P-3	P-4	P-5
PFBA	ND	ND	ND	ND	1.11
PFOA	0.416	ND	ND	ND	ND
PFOS	ND	0.501	0.312	ND	ND

None of the samples exhibited PFOA or PFOS material above 1 ppb. Samples P-1 and P-2 were selected for SPLP analysis because those samples exhibited the highest levels of PFOA/PFOS. For soil to be reused, the NYSDEC's recommends that analytical results for PFOA or PFOS exhibiting greater than 1 part per billion (ppb) be submitted for Synthetic Precipitation Leachability Procedure (SPLP) testing to ensure the soil does not have the capacity to leach PFOS or PFOA above NYSDEC Drinking Water Level of 10 ppt limit. First Environment submitted two soil samples for SPLP out of an abundance of caution.

The SPLP results indicated several more detections in each sample, but all detections were below the 10 ppt threshold. The full results of the Total PFAS and SPLP PFAS analysis are attached as Table 1. Laboratory results are presented in Appendix B.

Groundwater Results

The laboratory data from the five groundwater samples collected on April 21, 2022 indicate PFOA and PFOS levels above the NYSDEC limit of 10 ppb for both compounds in all samples. PFOS ranged in concentration from 10.8 ppt to 440 ppt. PFOA ranged in concentration from 9.34 to 152 ppt. Table 2 summarizes the PFAS laboratory analytical results. The laboratory results are included in Appendix B.

Groundwater Levels

The groundwater level in the piezometers (P-1 through P-5), as well as localized monitoring wells, was measured on April 21 and 26, and May 6 and 20, 2022. The four overburden wells in close proximity to the proposed alignment of the water pipeline were also measured on those dates, except April 21. The purpose of measuring water levels was to understand the depth-of-water below ground surface relative to the depth of construction along the waterline. It is estimated that the water line installation will require a minimum depth of 4.0 feet bgs to place the waterline. As such, it is important to note where the groundwater is for purposes of dewatering. P-1, P-3, and P-5 had groundwater levels consistently above four feet. P-2 was consistently, if marginally, below four feet. The level in P-4 was generally between three and four feet. Table 3 includes the monitoring points and dates that establish the water levels in 'feet bgs'. The location of the monitoring points is shown in Figure 1. Additional water level measurements were conducted after May 20, 2022 and continued through October 30, 2022. During July and August, due to low rainfall, a significant drop in the water table between 1 to 3 feet was identified, as shown in hydrographs located in Appendix C.

If you have any questions, please do not hesitate to call.

Regards,

FIRST ENVIRONMENT, INC.



Scott R. Green, P.G.
Director, Insurance Consulting Service Group



David Luer
Project Manager/Field Team Leader

TABLES

TABLE 1
Summary of PFAS Groundwater Results
Water Supply Pipeline Installation
Westchester County Airport

Sample ID York ID Sampling Date Client Matrix	P1 (0-4) 22D0978-01 4/19/2022 9:45:00 AM Soil		P2 (0-4) 22D0978-02 4/19/2022 10:45:00 AM Soil		P3 (0-4) 22D0978-03 4/19/2022 11:45:00 AM Soil		P4 (0-4) 22D0978-04 4/19/2022 2:40:00 PM Soil		P5 (0-4) 22D1041-01 4/20/2022 9:00:00 AM Soil	
	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Total Solids	%		%		%		%		%	
Dilution Factor	1		1		1		1		1	
% Solids	84.400		90.600		84.700		86.800		86.800	
PFAS, NYSDEC Target List	ug/kg		ug/kg		ug/kg		ug/kg		ug/kg	
Dilution Factor	1		1		1		1		1	
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)		U		U		U		U		U
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)		U		U		U		U		U
N-EtFOSAA		U		U		U		U		U
N-MeFOSAA		U		U		U		U		U
Perfluoro-1-decanesulfonic acid (PFDS)		U		U		U		U		U
Perfluoro-1-heptanesulfonic acid (PFHpS)		U		U		U		U		U
Perfluoro-1-octanesulfonamide (FOSA)		U		U		U		U		U
Perfluorobutanesulfonic acid (PFBS)		U		U		U		U		U
Perfluorodecanoic acid (PFDA)		U		U		U		U		U
Perfluorododecanoic acid (PFDoA)		U		U		U		U		U
Perfluoroheptanoic acid (PFHpA)		U		U		U		U		U
Perfluorohexanesulfonic acid (PFHxS)		U		U		U		U		U
Perfluorohexanoic acid (PFHxA)		U		U		U		U		U
Perfluoro-n-butanoic acid (PFBA)		U		U		U		U	1.11	U
Perfluorononanoic acid (PFNA)		U		U		U		U		U
Perfluorooctanesulfonic acid (PFOS)		U	0.501		0.312				U	U
Perfluorooctanoic acid (PFOA)	0.416			U		U		U		U
Perfluoropentanoic acid (PFPeA)		U		U		U		U		U
Perfluorotetradecanoic acid (PFTA)		U		U		U		U		U
Perfluorotridecanoic acid (PFTrDA)		U		U		U		U		U
Perfluoroundecanoic acid (PFUnA)		U		U		U		U		U

Total PFAS	0.416	0.501	0.312	0	1.11
PFOS + PFOA	0.416	0.501	0.312	0	0

PFAS, SPLP NYSDEC Target List	ng/L		ng/L						
	Result	Q	Result	Q					
Dilution Factor	1		1						
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)		U		U	NT		NT		NT
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)		U		U	NT		NT		NT
N-EtFOSAA		U		U	NT		NT		NT
N-MeFOSAA		U		U	NT		NT		NT
Perfluoro-1-decanesulfonic acid (PFDS)		U		U	NT		NT		NT
Perfluoro-1-heptanesulfonic acid (PFHpS)		U		U	NT		NT		NT
Perfluoro-1-octanesulfonamide (FOSA)		U		U	NT		NT		NT
Perfluorobutanesulfonic acid (PFBS)		U		U	NT		NT		NT
Perfluorodecanoic acid (PFDA)		U		U	NT		NT		NT
Perfluorododecanoic acid (PFDoA)		U		U	NT		NT		NT
Perfluoroheptanoic acid (PFHpA)		U		U	NT		NT		NT
Perfluorohexanesulfonic acid (PFHxS)	3.43		4.22		NT		NT		NT
Perfluorohexanoic acid (PFHxA)	2.53			U	NT		NT		NT
Perfluoro-n-butanoic acid (PFBA)	2.85			U	NT		NT		NT
Perfluorononanoic acid (PFNA)		U		U	NT		NT		NT
Perfluorooctanesulfonic acid (PFOS)	2.09		3.98		NT		NT		NT
Perfluorooctanoic acid (PFOA)	9.13		4.86		NT		NT		NT
Perfluoropentanoic acid (PFPeA)	2.64			U	NT		NT		NT
Perfluorotetradecanoic acid (PFTA)		U		U	NT		NT		NT
Perfluorotridecanoic acid (PFTrDA)		U		U	NT		NT		NT
Perfluoroundecanoic acid (PFUnA)		U		U	NT		NT		NT

Total PFAS	22.67	13.06
PFOS + PFOA	11.22	8.84

TABLE 2
Summary of PFAS Groundwater Results
Water Supply Pipeline Installation
Westchester County Airport

Sample ID York ID Sampling Date Client Matrix	P1 GW 22D1116-01 4/21/2022 9:00:00 AM Water	P2 GW 22D1116-02 4/21/2022 9:20:00 AM Water		P3 GW 22D1116-03 4/21/2022 9:35:00 AM Water		P4 GW 22D1116-04 4/21/2022 10:00:00 AM Water		P5 GW 22D1116-05 4/21/2022 10:20:00 AM Water			
		Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Compound	CAS Number	ng/L		ng/L		ng/L		ng/L		ng/L	
PFAS, NYSDEC Target List											
Dilution Factor		1		10		1		5		1	
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	39108-34-4		U	15.3			U	14.2			U
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	27619-97-2		U	96.2	D		U	5.14			U
N-EtFOSAA	2991-50-6		U		U		U		U		U
N-MeFOSAA	2355-31-9		U		U		U		U		U
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3		U		U		U		U		U
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	2.81		10.7			U	3.78			U
Perfluoro-1-octanesulfonamide (FOSA)	754-91-6		U		U		U		U		U
Perfluorobutanesulfonic acid (PFBS)	375-73-5	6.65		27.7		5.94			U	4.43	
Perfluorodecanoic acid (PFDA)	335-76-2		U		U		U		U		U
Perfluorododecanoic acid (PFDoA)	307-55-1		U		U		U		U		U
Perfluoroheptanoic acid (PFHpA)	375-85-9	25.5		46.2		5.65		8.81		4.58	
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	83		360	D	16.6		43.9		5.95	
Perfluorohexanoic acid (PFHxA)	307-24-4	56.4		107		9.2		20.5		6.37	
Perfluoro-n-butanoic acid (PFBA)	375-22-4	40.8		86.3		9.94		15.6		15.2	
Perfluorononanoic acid (PFNA)	375-95-1	43.9		11.6		7.81		3.95		9.52	
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	75.6		490	D	19		220	D	10.8	
Perfluorooctanoic acid (PFOA)	335-67-1	152		88.9		25		9.34		25.2	
Perfluoropentanoic acid (PFPeA)	2706-90-3	81.2		155		12.5		43		10.2	
Perfluorotetradecanoic acid (PFTA)	376-06-7		U		U		U		U		U
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8		U		U		U		U		U
Perfluoroundecanoic acid (PFUnA)	2058-94-8		U		U	2.48			U		U

Total PFAS	567.86	1494.9	114.12	388.22	92.25
PFOA and PFOS	227.6	578.9	44	229.34	36

TABLE 3
Westchester County Airport
Piezometer Groundwater Levels

Well	Date	Depth Below Ground Surface (Ft Bgs)
Temp Wells		
P-1	4/21/2022	3.06
	4/26/2022	3.58
	5/6/2022	3.67
	5/20/2022	4.00
P-2	4/21/2022	4.74
	4/26/2022	4.75
	5/6/2022	4.86
	5/20/2022	4.83
P-3	4/21/2022	0.85
	4/26/2022	1.55
	5/6/2022	1.97
	5/20/2022	1.78
P-4	4/21/2022	3.10
	4/26/2022	3.53
	5/6/2022	4.01
	5/20/2022	3.86
P-5	4/21/2022	0.93
	4/26/2022	2.45
	5/6/2022	2.30
	5/20/2022	NM
Permanent Wells		
FMW-13R	4/26/2022	3.92
	5/6/2022	4.5
	5/20/2022	7.24
FMW-14	4/26/2022	1.78
	5/6/2022	2.07
	5/20/2022	2.43
FMW-15	4/26/2022	6.16
	5/6/2022	6.7
	5/20/2022	7.05
FMW-16	4/26/2022	1.86
	5/6/2022	2.2
	5/20/2022	2.1

FIGURES

APPENDIX A



First Environment, Inc.
 10 Park Place, Bldg 1, Suite 504
 Butler, NJ 07405
 Telephone: 973-334-0003

CLIENT OLA Consulting Engineers **PROJECT NAME** WCA Waterline Installation
PROJECT NUMBER OLACE001 **PROJECT LOCATION** Westchester, New York
DATE STARTED 04/19/22 **COMPLETED** 04/19/22 **GROUND ELEVATION** _____ **HOLE SIZE** 3 inches
DRILLING CONTRACTOR STI **GROUND WATER LEVELS:**
DRILLING METHOD Direct Push **AT TIME OF DRILLING** 5.00 ft
LOGGED BY DHFL **CHECKED BY** _____ **AT END OF DRILLING** ---
NOTES _____ **AFTER DRILLING** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0					(SM) Dark brown, SAND, little silt, sand fine to medium, moist	<p>1 inch PVC</p> <p>1 inch slotted PVC</p>
2.0	GB P-1 (0-4) Comp UD 1				(SM) Light brown, SAND, little silt, WET, perched	
3.0					(SM) Light brown, SAND, some silt, sand fine to medium, moist to wet	
5	UD 2				▽	
9.0					(SP-SM) Light brown, SAND, few silt, few gravel, sand medium to coarse, mois	
10	UD 3				(SM) Light grayish brown, SAND< little to some silt, few gravel, wet	
15.0						

Bottom of borehole at 15.0 feet.

ENVIRONMENTAL BH - GINT STD US LAB.GDT - 06/10/22 12:29 - G:\DATA\PROJECT\OLA CONSULTING ENGINEERS - OLACE001\WORKING FOLDER\BORING LOGS\OLACE001 PIEZOMETER LOGS.GPJ



First Environment, Inc.
 10 Park Place, Bldg 1, Suite 504
 Butler, NJ 07405
 Telephone: 973-334-0003

CLIENT OLA Consulting Engineers **PROJECT NAME** WCA Waterline Installation
PROJECT NUMBER OLACE001 **PROJECT LOCATION** Westchester, New York
DATE STARTED 04/19/22 **COMPLETED** 04/19/22 **GROUND ELEVATION** _____ **HOLE SIZE** 3 inches
DRILLING CONTRACTOR STI **GROUND WATER LEVELS:**
DRILLING METHOD Direct Push **AT TIME OF DRILLING** 8.50 ft
LOGGED BY DHFL **CHECKED BY** _____ **AT END OF DRILLING** ---
NOTES _____ **AFTER DRILLING** ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0						
0 - 3.5	GB P-2 (0-4) Comp UD 1			[Cross-hatched pattern]	(SM) Dark brown, SAND, some silt, few gravel, sand fine to coarse, moist, FILL	
3.5 - 8.0				[Diagonal line pattern]	(SM) Brown, SAND, little silt, few gravel, sand fine to coarse, moist, FILL	
8.0 - 8.5				[Horizontal line pattern]	(ML) Dark grayish brown, SILT, some sand, sand fine to medium, moist	
8.5 - 10.0				[Dotted pattern]	(CL) Dark grayish brown, CLAY, organic, moist	1 inch PVC
10.0 - 13.5	UD 2			[Vertical line pattern]	(SM) Gray, SAND, few to little silt, few gravel, sand fine to medium, wet	
13.5 - 15.0	UD 3			[Dotted pattern]	(SP-SM) Gray, SAND, few silt, few gravel, wet	1 inch slotted PVC
15.0				[Vertical line pattern]	(ML) Gray, SILT, few sand, wet	
Bottom of borehole at 15.0 feet.						

ENVIRONMENTAL BH - GINT STD US LAB.GDT - 06/10/22 12:29 - G:\DATA\PROJECT\OLA CONSULTING ENGINEERS - OLACE001\WORKING FOLDER\BORING LOGS\OLACE001 PIEZOMETER LOGS.GPJ



First Environment, Inc.
 10 Park Place, Bldg 1, Suite 504
 Butler, NJ 07405
 Telephone: 973-334-0003

CLIENT OLA Consulting Engineers PROJECT NAME WCA Waterline Installation
 PROJECT NUMBER OLACE001 PROJECT LOCATION Westchester, New York
 DATE STARTED 04/19/22 COMPLETED 04/19/22 GROUND ELEVATION _____ HOLE SIZE 3 inches
 DRILLING CONTRACTOR STI GROUND WATER LEVELS:
 DRILLING METHOD Direct Push ∇ AT TIME OF DRILLING 2.00 ft
 LOGGED BY DHFL CHECKED BY _____ AT END OF DRILLING ---
 NOTES _____ AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0					Dark brown, TOPSOIL	
0 - 4	GB P-3 (0-4) Comp UD 1				(SM) Brown, SAND, little to some silt, trace gravel, moist to wet, perched water at 2 feet	
4 - 7.5	UD 2				(ML) Grayish brown, SILT, some sand, trace gravel, moist	
7.5 - 11.5	UD 3				(SM) Grayish brown, SAND, little silt, moist	
11.5 - 13.0					Weathered BEDROCK - Schistose	

Refusal at 13.0 feet.
 Bottom of borehole at 13.0 feet.

ENVIRONMENTAL BH - GINT STD US LAB.GDT - 06/10/22 12:29 - G:\DATA\PROJECT\OLA CONSULTING ENGINEERS - OLACE001\WORKING FOLDER\BORING LOGS\OLACE001 PIEZOMETER LOGS.GPJ



First Environment, Inc.
 10 Park Place, Bldg 1, Suite 504
 Butler, NJ 07405
 Telephone: 973-334-0003

BORING NUMBER P-4

CLIENT OLA Consulting Engineers PROJECT NAME WCA Waterline Installation
 PROJECT NUMBER OLACE001 PROJECT LOCATION Westchester, New York
 DATE STARTED 04/19/22 COMPLETED 04/19/22 GROUND ELEVATION _____ HOLE SIZE 3 inches
 DRILLING CONTRACTOR STI GROUND WATER LEVELS:
 DRILLING METHOD Direct Push ∇ AT TIME OF DRILLING 5.00 ft
 LOGGED BY DHFL CHECKED BY _____ AT END OF DRILLING ---
 NOTES _____ AFTER DRILLING ---

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0						
0 - 4	GB P-4 (0-4) Comp UD 1				(SP) Gray to brown, mixed construction gravel and sand, little silt, moists	
5					5.0 ∇ (SM) Dark gray, SAND, little silt, wet	
7.0						
7.5	UD 2				Cobble	
7.5 - 10.0					(SM) Brown, SAND, little silt, few to little gravel, wet	
10						

Bottom of borehole at 10.0 feet.

ENVIRONMENTAL BH - GINT STD US LAB.GDT - 06/10/22 12:29 - G:\DATA\PROJECT\OLA CONSULTING ENGINEERS - OLACE001\WORKING FOLDER\BORING LOGS\OLACE001 PIEZOMETER LOGS.GPJ



First Environment, Inc.
 10 Park Place, Bldg 1, Suite 504
 Butler, NJ 07405
 Telephone: 973-334-0003

BORING NUMBER P-5

CLIENT <u>OLA Consulting Engineers</u>	PROJECT NAME <u>WCA Waterline Installation</u>
PROJECT NUMBER <u>OLACE001</u>	PROJECT LOCATION <u>Westchester, New York</u>
DATE STARTED <u>04/20/22</u> COMPLETED <u>04/20/22</u>	GROUND ELEVATION _____ HOLE SIZE <u>3 inches</u>
DRILLING CONTRACTOR <u>STI</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>Direct Push</u>	▽ AT TIME OF DRILLING <u>5.00 ft</u>
LOGGED BY <u>DHFL</u> CHECKED BY _____	AT END OF DRILLING <u>---</u>
NOTES _____	AFTER DRILLING <u>---</u>

ENVIRONMENTAL BH - GINT STD US LAB.GDT - 06/10/22 12:29 - G:\DATA\PROJECT\OLA CONSULTING ENGINEERS - OLACE001\WORKING FOLDER\BORING LOGS\OLACE001 PIEZOMETER LOGS.GPJ

DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	ENVIRONMENTAL DATA	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0						
0 - 1.0	GB P-5 (0-4) Comp				(ML) Grayish brown, SILT, some sand, moist	<p>1 inch PVC</p> <p>1 inch slotted PVC</p>
1.0 - 1.5					(SM) Reddish brown, SAND, little silt, little gravel, moist	
1.5 - 6.0	UD 1				(SM) Brown, SAND, little silt, few gravel, moist to wet	
6.0 - 8.5					(SP-SM) Grayish brown, SAND, little to few silt, little gravel, wet	
8.5 - 10.0	UD 2				(SM) Gray SAND, some silt, little gravel, moist	
10.0					Bottom of borehole at 10.0 feet.	

APPENDIX B



Technical Report

prepared for:

WSP USA, Inc. (White Plains, NY)
500 Summit Lake Drive, Suite 450
Valhalla NY, 10595
Attention: John Benvegna

Report Date: 04/29/2022
Client Project ID: 31402220.002 Westchester County Airport
York Project (SDG) No.: 22D0978

CT Cert. No. PH-0723

New Jersey Cert. No. CT005 and NY037



New York Cert. Nos. 10854 and 12058

PA Cert. No. 68-04440

120 RESEARCH DRIVE
www.YORKLAB.com

STRATFORD, CT 06615
(203) 325-1371

132-02 89th AVENUE
FAX (203) 357-0166

RICHMOND HILL, NY 11418
ClientServices@yorklab.com

Report Date: 04/29/2022
Client Project ID: 31402220.002 Westchester County Airport
York Project (SDG) No.: 22D0978

WSP USA, Inc. (White Plains, NY)
500 Summit Lake Drive, Suite 450
Valhalla NY, 10595
Attention: John Benvegna

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on April 20, 2022 and listed below. The project was identified as your project: **31402220.002 Westchester County Airport**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

<u>York Sample ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>
22D0978-01	P1 (0-4)	Soil	04/19/2022	04/20/2022
22D0978-02	P2 (0-4)	Soil	04/19/2022	04/20/2022
22D0978-03	P3 (0-4)	Soil	04/19/2022	04/20/2022
22D0978-04	P4 (0-4)	Soil	04/19/2022	04/20/2022

General Notes for York Project (SDG) No.: 22D0978

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By: 

Date: 04/29/2022

Cassie L. Mosher
Laboratory Manager





Sample Information

Client Sample ID: P1 (0-4)

York Sample ID: 22D0978-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22D0978	31402220.002 Westchester County Airport	Soil	April 19, 2022 9:45 am	04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
2991-50-6	* N-EtFOSAA	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
2355-31-9	* N-MeFOSAA	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	0.416		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
72629-94-8	* Perfluorotridecanoic acid (PFTTrDA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
Surrogate Recoveries		Result	Acceptance Range							
Surrogate: M3PFBS		75.2 %	25-150							



Sample Information

Client Sample ID: P1 (0-4)

York Sample ID: 22D0978-01

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 9:45 am

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: M5PFHxA	71.6 %			25-150					
	Surrogate: M4PFHpA	89.0 %			25-150					
	Surrogate: M3PFHxS	84.9 %			25-150					
	Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	66.0 %			25-150					
	Surrogate: M6PFDA	64.3 %			25-150					
	Surrogate: M7PFUdA	67.3 %			25-150					
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	64.1 %			25-150					
	Surrogate: M2PFTeDA	52.9 %			10-150					
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	74.5 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	62.5 %			25-150					
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	68.1 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	52.9 %			10-150					
	Surrogate: d3-N-MeFOSAA	77.5 %			25-150					
	Surrogate: d5-N-EtFOSAA	95.4 %			25-150					
	Surrogate: M2-6:2 FTS	135 %			25-200					
	Surrogate: M2-8:2 FTS	157 %			25-200					
	Surrogate: M9PFNA	61.2 %			25-150					

Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	* % Solids	84.4		%	0.100	1	SM 2540G	04/27/2022 09:27	04/27/2022 13:26	VR
							Certifications:	CTDOH		

Sample Information

Client Sample ID: P2 (0-4)

York Sample ID: 22D0978-02

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 10:45 am

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:



Sample Information

Client Sample ID: P2 (0-4)

York Sample ID: 22D0978-02

<u>York Project (SDG) No.</u> 22D0978	<u>Client Project ID</u> 31402220.002 Westchester County Airport	<u>Matrix</u> Soil	<u>Collection Date/Time</u> April 19, 2022 10:45 am	<u>Date Received</u> 04/20/2022
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Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
2991-50-6	* N-EtFOSAA	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
2355-31-9	* N-MeFOSAA	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	0.501		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
72629-94-8	* Perfluorotridecanoic acid (PFTTrDA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL

Surrogate Recoveries	Result	Acceptance Range
Surrogate: M3PFBS	70.3 %	25-150
Surrogate: M5PFHxA	72.8 %	25-150
Surrogate: M4PFHpA	87.6 %	25-150



Sample Information

Client Sample ID: P2 (0-4)

York Sample ID: 22D0978-02

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 10:45 am

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

Table with 11 columns: CAS No., Parameter, Result, Flag, Units, Reported to LOQ, Dilution, Reference Method, Date/Time Prepared, Date/Time Analyzed, Analyst. Rows include various surrogate PFAS compounds and their results.

Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

Table with 11 columns: CAS No., Parameter, Result, Flag, Units, Reported to LOQ, Dilution, Reference Method, Date/Time Prepared, Date/Time Analyzed, Analyst. Row for Total Solids showing 90.6% result.

Sample Information

Client Sample ID: P3 (0-4)

York Sample ID: 22D0978-03

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 11:45 am

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

Table with 11 columns: CAS No., Parameter, Result, Flag, Units, Reported to LOQ, Dilution, Reference Method, Date/Time Prepared, Date/Time Analyzed, Analyst.



Sample Information

Client Sample ID: P3 (0-4)

York Sample ID: 22D0978-03

<u>York Project (SDG) No.</u> 22D0978	<u>Client Project ID</u> 31402220.002 Westchester County Airport	<u>Matrix</u> Soil	<u>Collection Date/Time</u> April 19, 2022 11:45 am	<u>Date Received</u> 04/20/2022
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PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
2991-50-6	* N-EtFOSAA	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
2355-31-9	* N-MeFOSAA	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	0.312		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
72629-94-8	* Perfluorotridecanoic acid (PFTTrDA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL

Surrogate Recoveries	Result	Acceptance Range
Surrogate: M3PFBS	75.4 %	25-150



Sample Information

Client Sample ID: P3 (0-4)

York Sample ID: 22D0978-03

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 11:45 am

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: M5PFHxA	74.4 %			25-150					
	Surrogate: M4PFHpA	89.1 %			25-150					
	Surrogate: M3PFHxS	79.6 %			25-150					
	Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	75.7 %			25-150					
	Surrogate: M6PFDA	69.2 %			25-150					
	Surrogate: M7PFUdA	62.5 %			25-150					
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	66.4 %			25-150					
	Surrogate: M2PFTeDA	49.4 %			10-150					
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	78.7 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	64.1 %			25-150					
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	74.8 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	54.5 %			10-150					
	Surrogate: d3-N-MeFOSAA	67.3 %			25-150					
	Surrogate: d5-N-EtFOSAA	82.9 %			25-150					
	Surrogate: M2-6:2 FTS	74.6 %			25-200					
	Surrogate: M2-8:2 FTS	98.2 %			25-200					
	Surrogate: M9PFNA	72.9 %			25-150					

Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	* % Solids	84.7		%	0.100	1	SM 2540G	04/27/2022 09:27	04/27/2022 13:26	VR
							Certifications:	CTDOH		

Sample Information

Client Sample ID: P4 (0-4)

York Sample ID: 22D0978-04

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 2:40 pm

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:



Sample Information

Client Sample ID: P4 (0-4)

York Sample ID: 22D0978-04

<u>York Project (SDG) No.</u> 22D0978	<u>Client Project ID</u> 31402220.002 Westchester County Airport	<u>Matrix</u> Soil	<u>Collection Date/Time</u> April 19, 2022 2:40 pm	<u>Date Received</u> 04/20/2022
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Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
2991-50-6	* N-EtFOSAA	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
2355-31-9	* N-MeFOSAA	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
72629-94-8	* Perfluorotridecanoic acid (PFTrDA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL

Surrogate Recoveries	Result	Acceptance Range
Surrogate: M3PFBS	75.4 %	25-150
Surrogate: M5PFHxA	71.8 %	25-150
Surrogate: M4PFHpA	94.5 %	25-150



Sample Information

Client Sample ID: P4 (0-4)

York Sample ID: 22D0978-04

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 2:40 pm

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: M3PFHxS	79.7 %			25-150					
	Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	72.2 %			25-150					
	Surrogate: M6PFDA	71.9 %			25-150					
	Surrogate: M7PFUdA	66.1 %			25-150					
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	63.9 %			25-150					
	Surrogate: M2PFTeDA	44.3 %			10-150					
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	75.4 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	67.9 %			25-150					
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	73.9 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	57.7 %			10-150					
	Surrogate: d3-N-MeFOSAA	69.0 %			25-150					
	Surrogate: d5-N-EtFOSAA	79.7 %			25-150					
	Surrogate: M2-6:2 FTS	76.5 %			25-200					
	Surrogate: M2-8:2 FTS	90.3 %			25-200					
	Surrogate: M9PFNA	79.0 %			25-150					

Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	* % Solids	86.8		%	0.100	1	SM 2540G	04/22/2022 15:16	04/22/2022 15:21	YR
							Certifications: CTDOH			



Analytical Batch Summary

Batch ID: BD21377 **Preparation Method:** SPE PFAS Extraction-Soil-EPA 537m **Prepared By:** WEL

YORK Sample ID	Client Sample ID	Preparation Date
22D0978-01	P1 (0-4)	04/22/22
22D0978-02	P2 (0-4)	04/22/22
22D0978-03	P3 (0-4)	04/22/22
22D0978-04	P4 (0-4)	04/22/22
BD21377-BLK1	Blank	04/22/22
BD21377-BS1	LCS	04/22/22
BD21377-MS1	Matrix Spike	04/22/22
BD21377-MSD1	Matrix Spike Dup	04/22/22

Batch ID: BD21403 **Preparation Method:** % Solids Prep **Prepared By:** YR

YORK Sample ID	Client Sample ID	Preparation Date
22D0978-04	P4 (0-4)	04/22/22
BD21403-DUP1	Duplicate	04/22/22

Batch ID: BD21612 **Preparation Method:** % Solids Prep **Prepared By:** VR

YORK Sample ID	Client Sample ID	Preparation Date
22D0978-01	P1 (0-4)	04/27/22
22D0978-02	P2 (0-4)	04/27/22
22D0978-03	P3 (0-4)	04/27/22
BD21612-DUP1	Duplicate	04/27/22



PFAS Target compounds by LC/MS-MS - Quality Control Data
York Analytical Laboratories, Inc.

Analyte	Result	Reporting	Units	Spike Level	Source*	%REC	%REC	Flag	RPD	RPD	Limit	Flag
		Limit			Result	Limits	Limit					

Batch BD21377 - SPE PFAS Extraction-Soil-EPA 537m

Blank (BD21377-BLK1)

Prepared: 04/22/2022 Analyzed: 04/29/2022

1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND	0.232	ug/kg wet									
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND	0.232	"									
N-EtFOSAA	ND	0.232	"									
N-MeFOSAA	ND	0.232	"									
Perfluoro-1-decanesulfonic acid (PFDS)	ND	0.232	"									
Perfluoro-1-heptanesulfonic acid (PFHpS)	ND	0.232	"									
Perfluoro-1-octanesulfonamide (FOSA)	ND	0.232	"									
Perfluorobutanesulfonic acid (PFBS)	ND	0.232	"									
Perfluorodecanoic acid (PFDA)	ND	0.232	"									
Perfluorododecanoic acid (PFDoA)	ND	0.232	"									
Perfluoroheptanoic acid (PFHpA)	ND	0.232	"									
Perfluorohexanesulfonic acid (PFHxS)	ND	0.232	"									
Perfluorohexanoic acid (PFHxA)	ND	0.232	"									
Perfluoro-n-butanoic acid (PFBA)	ND	0.232	"									
Perfluorononanoic acid (PFNA)	ND	0.232	"									
Perfluorooctanesulfonic acid (PFOS)	ND	0.232	"									
Perfluorooctanoic acid (PFOA)	ND	0.232	"									
Perfluoropentanoic acid (PFPeA)	ND	0.232	"									
Perfluorotetradecanoic acid (PFTA)	ND	0.232	"									
Perfluorotridecanoic acid (PFTTrDA)	ND	0.232	"									
Perfluoroundecanoic acid (PFUnA)	ND	0.232	"									
Surrogate: M3PFBS	3.17		"	4.31		73.6	25-150					
Surrogate: M5PFHxA	3.33		"	4.64		71.7	25-150					
Surrogate: M4PFHpA	4.20		"	4.64		90.5	25-150					
Surrogate: M3PFHxS	3.74		"	4.39		85.1	25-150					
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	3.48		"	4.64		74.9	25-150					
Surrogate: M6PFDA	3.36		"	4.64		72.4	25-150					
Surrogate: M7PFUdA	3.27		"	4.64		70.4	25-150					
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.05		"	4.64		65.7	25-150					
Surrogate: M2PFTeDA	2.78		"	4.64		59.9	10-150					
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	3.52		"	4.64		75.8	25-150					
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.19		"	4.44		71.8	25-150					
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	3.34		"	4.64		72.0	25-150					
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	2.71		"	4.64		58.4	10-150					
Surrogate: d3-N-MeFOSAA	3.58		"	4.64		77.1	25-150					
Surrogate: d5-N-EtFOSAA	3.78		"	4.64		81.5	25-150					
Surrogate: M2-6:2 FTS	3.66		"	4.41		83.0	25-200					
Surrogate: M2-8:2 FTS	5.11		"	4.45		115	25-200					
Surrogate: M9PFNA	3.95		"	4.64		85.0	25-150					



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BD21377 - SPE PFAS Extraction-Soil-EPA 537m											
LCS (BD21377-BS1)											
Prepared: 04/22/2022 Analyzed: 04/29/2022											
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	5.13	0.242	ug/kg wet	4.65		110	50-200				
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	3.90	0.242	"	4.61		84.7	50-200				
N-EtFOSAA	4.84	0.242	"	4.85		99.9	50-130				
N-MeFOSAA	4.84	0.242	"	4.85		99.9	50-130				
Perfluoro-1-decanesulfonic acid (PFDS)	4.80	0.242	"	4.68		103	50-130				
Perfluoro-1-heptanesulfonic acid (PFHpS)	5.35	0.242	"	4.63		116	50-130				
Perfluoro-1-octanesulfonamide (FOSA)	5.70	0.242	"	4.85		118	50-130				
Perfluorobutanesulfonic acid (PFBS)	4.58	0.242	"	4.29		107	50-130				
Perfluorodecanoic acid (PFDA)	5.50	0.242	"	4.85		113	50-130				
Perfluorododecanoic acid (PFDoA)	5.17	0.242	"	4.85		107	50-130				
Perfluoroheptanoic acid (PFHpA)	4.70	0.242	"	4.85		97.0	50-130				
Perfluorohexanesulfonic acid (PFHxS)	5.87	0.242	"	4.41		133	50-130	High Bias			
Perfluorohexanoic acid (PFHxA)	5.40	0.242	"	4.85		111	50-130				
Perfluoro-n-butanoic acid (PFBA)	5.45	0.242	"	4.85		112	50-130				
Perfluorononanoic acid (PFNA)	5.74	0.242	"	4.85		118	50-130				
Perfluorooctanesulfonic acid (PFOS)	4.91	0.242	"	4.48		109	50-130				
Perfluorooctanoic acid (PFOA)	5.62	0.242	"	4.85		116	50-130				
Perfluoropentanoic acid (PFPeA)	5.65	0.242	"	4.85		117	50-130				
Perfluorotetradecanoic acid (PFTA)	5.81	0.242	"	4.85		120	50-130				
Perfluorotridecanoic acid (PFTrDA)	5.22	0.242	"	4.85		108	50-130				
Perfluoroundecanoic acid (PFUnA)	5.99	0.242	"	4.85		124	50-130				
Surrogate: M3PFBS	3.53		"	4.50		78.5	25-150				
Surrogate: M5PFHxA	3.59		"	4.85		74.0	25-150				
Surrogate: M4PFHpA	4.52		"	4.85		93.3	25-150				
Surrogate: M3PFHxS	3.64		"	4.59		79.5	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	3.94		"	4.85		81.3	25-150				
Surrogate: M6PFDA	3.67		"	4.85		75.6	25-150				
Surrogate: M7PFUdA	3.28		"	4.85		67.7	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.45		"	4.85		71.1	25-150				
Surrogate: M2PFTeDA	2.90		"	4.85		59.8	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	3.78		"	4.85		78.1	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.60		"	4.64		77.6	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	3.57		"	4.85		73.5	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	3.22		"	4.85		66.4	10-150				
Surrogate: d3-N-MeFOSAA	3.61		"	4.85		74.5	25-150				
Surrogate: d5-N-EtFOSAA	4.23		"	4.85		87.2	25-150				
Surrogate: M2-6:2 FTS	4.53		"	4.60		98.4	25-200				
Surrogate: M2-8:2 FTS	4.81		"	4.64		104	25-200				
Surrogate: M9PFNA	3.74		"	4.85		77.1	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BD21377 - SPE PFAS Extraction-Soil-EPA 537m

Matrix Spike (BD21377-MS1)	*Source sample: 22D1076-02 (Matrix Spike)						Prepared: 04/22/2022 Analyzed: 04/29/2022				
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	6.11	0.279	ug/kg dry	5.36	ND	114	25-200				
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	5.01	0.279	"	5.31	ND	94.4	25-200				
N-EtFOSAA	6.17	0.279	"	5.59	ND	111	25-150				
N-MeFOSAA	6.92	0.279	"	5.59	ND	124	25-150				
Perfluoro-1-decanesulfonic acid (PFDS)	5.51	0.279	"	5.39	ND	102	25-150				
Perfluoro-1-heptanesulfonic acid (PFHpS)	6.92	0.279	"	5.33	ND	130	25-150				
Perfluoro-1-octanesulfonamide (FOSA)	6.74	0.279	"	5.59	ND	121	25-150				
Perfluorobutanesulfonic acid (PFBS)	5.22	0.279	"	4.94	ND	106	25-150				
Perfluorodecanoic acid (PFDA)	5.69	0.279	"	5.59	ND	102	25-150				
Perfluorododecanoic acid (PFDoA)	6.03	0.279	"	5.59	ND	108	25-150				
Perfluoroheptanoic acid (PFHpA)	5.68	0.279	"	5.59	ND	102	25-150				
Perfluorohexanesulfonic acid (PFHxS)	6.06	0.279	"	5.08	ND	119	25-150				
Perfluorohexanoic acid (PFHxA)	6.21	0.279	"	5.59	ND	111	25-150				
Perfluoro-n-butanoic acid (PFBA)	6.45	0.279	"	5.59	0.400	108	25-150				
Perfluorononanoic acid (PFNA)	6.11	0.279	"	5.59	ND	109	25-150				
Perfluorooctanesulfonic acid (PFOS)	6.64	0.279	"	5.17	0.526	118	25-150				
Perfluorooctanoic acid (PFOA)	6.64	0.279	"	5.59	ND	119	25-150				
Perfluoropentanoic acid (PFPeA)	6.46	0.279	"	5.59	ND	116	25-150				
Perfluorotetradecanoic acid (PFTA)	6.46	0.279	"	5.59	ND	116	25-150				
Perfluorotridecanoic acid (PFTrDA)	6.13	0.279	"	5.59	ND	110	25-150				
Perfluoroundecanoic acid (PFUnA)	6.33	0.279	"	5.59	ND	113	25-150				
Surrogate: M3PFBS	4.06		"	5.19		78.3	25-150				
Surrogate: M5PFHxA	4.23		"	5.59		75.7	25-150				
Surrogate: M4PFHpA	5.09		"	5.59		91.1	25-150				
Surrogate: M3PFHxS	4.57		"	5.28		86.5	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	4.52		"	5.59		81.0	25-150				
Surrogate: M6PFDA	4.37		"	5.59		78.2	25-150				
Surrogate: M7PFUdA	3.72		"	5.59		66.7	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.47		"	5.59		62.2	25-150				
Surrogate: M2PFTeDA	2.45		"	5.59		43.9	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	4.38		"	5.59		78.4	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.77		"	5.34		70.5	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	4.14		"	5.59		74.1	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	3.32		"	5.59		59.5	10-150				
Surrogate: d3-N-MeFOSAA	3.80		"	5.59		68.1	25-150				
Surrogate: d5-N-EtFOSAA	4.71		"	5.59		84.4	25-150				
Surrogate: M2-6:2 FTS	6.77		"	5.30		128	25-200				
Surrogate: M2-8:2 FTS	7.13		"	5.35		133	25-200				
Surrogate: M9PFNA	4.43		"	5.59		79.3	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BD21377 - SPE PFAS Extraction-Soil-EPA 537m

Matrix Spike Dup (BD21377-MSD1)	*Source sample: 22D1076-02 (Matrix Spike Dup)						Prepared: 04/22/2022 Analyzed: 04/29/2022				
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	5.49	0.263	ug/kg dry	5.05	ND	109	25-200		10.8	35	
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	4.62	0.263	"	5.00	ND	92.6	25-200		8.00	35	
N-EtFOSAA	5.95	0.263	"	5.26	ND	113	25-150		3.76	35	
N-MeFOSAA	5.61	0.263	"	5.26	ND	107	25-150		20.9	35	
Perfluoro-1-decanesulfonic acid (PFDS)	5.60	0.263	"	5.07	ND	110	25-150		1.65	35	
Perfluoro-1-heptanesulfonic acid (PFHpS)	7.84	0.263	"	5.02	ND	156	25-150	High Bias	12.4	35	
Perfluoro-1-octanesulfonamide (FOSA)	6.04	0.263	"	5.26	ND	115	25-150		11.0	35	
Perfluorobutanesulfonic acid (PFBS)	5.12	0.263	"	4.65	ND	110	25-150		2.01	35	
Perfluorodecanoic acid (PFDA)	5.95	0.263	"	5.26	ND	113	25-150		4.40	35	
Perfluorododecanoic acid (PFDoA)	5.71	0.263	"	5.26	ND	109	25-150		5.52	35	
Perfluoroheptanoic acid (PFHpA)	5.56	0.263	"	5.26	ND	106	25-150		2.28	35	
Perfluorohexanesulfonic acid (PFHxS)	5.98	0.263	"	4.79	ND	125	25-150		1.22	35	
Perfluorohexanoic acid (PFHxA)	5.97	0.263	"	5.26	ND	113	25-150		4.01	35	
Perfluoro-n-butanoic acid (PFBA)	6.04	0.263	"	5.26	0.400	107	25-150		6.45	35	
Perfluorononanoic acid (PFNA)	6.23	0.263	"	5.26	ND	118	25-150		1.94	35	
Perfluorooctanesulfonic acid (PFOS)	6.87	0.263	"	4.86	0.526	130	25-150		3.32	35	
Perfluorooctanoic acid (PFOA)	6.50	0.263	"	5.26	ND	124	25-150		2.14	35	
Perfluoropentanoic acid (PFPeA)	6.02	0.263	"	5.26	ND	115	25-150		6.93	35	
Perfluorotetradecanoic acid (PFTA)	6.00	0.263	"	5.26	ND	114	25-150		7.24	35	
Perfluorotridecanoic acid (PFTrDA)	6.56	0.263	"	5.26	ND	125	25-150		6.69	35	
Perfluoroundecanoic acid (PFUnA)	6.26	0.263	"	5.26	ND	119	25-150		1.01	35	
Surrogate: M3PFBS	3.84		"	4.89		78.6	25-150				
Surrogate: M5PFHxA	4.01		"	5.26		76.3	25-150				
Surrogate: M4PFHpA	4.66		"	5.26		88.6	25-150				
Surrogate: M3PFHxS	4.17		"	4.97		83.8	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	4.19		"	5.26		79.7	25-150				
Surrogate: M6PFDA	3.94		"	5.26		74.9	25-150				
Surrogate: M7PFUdA	3.54		"	5.26		67.2	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.40		"	5.26		64.7	25-150				
Surrogate: M2PFTeDA	2.71		"	5.26		51.5	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	4.13		"	5.26		78.6	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.18		"	5.03		63.3	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	3.93		"	5.26		74.7	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	3.18		"	5.26		60.6	10-150				
Surrogate: d3-N-MeFOSAA	3.98		"	5.26		75.8	25-150				
Surrogate: d5-N-EtFOSAA	4.58		"	5.26		87.1	25-150				
Surrogate: M2-6:2 FTS	6.85		"	4.99		137	25-200				
Surrogate: M2-8:2 FTS	7.82		"	5.04		155	25-200				
Surrogate: M9PFNA	3.97		"	5.26		75.5	25-150				



Miscellaneous Physical Parameters - Quality Control Data
York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BD21403 - % Solids Prep

Duplicate (BD21403-DUP1)	*Source sample: 22D0884-01 (Duplicate)						Prepared & Analyzed: 04/22/2022					
% Solids	93.4	0.100	%		93.6				0.217	20		

Batch BD21612 - % Solids Prep

Duplicate (BD21612-DUP1)	*Source sample: 22D1244-05 (Duplicate)						Prepared & Analyzed: 04/27/2022					
% Solids	85.8	0.100	%		85.8				0.00804	20		



Sample and Data Qualifiers Relating to This Work Order

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.



Technical Report

prepared for:

WSP USA, Inc. (White Plains, NY)
500 Summit Lake Drive, Suite 450
Valhalla NY, 10595
Attention: John Benvegna

Report Date: 05/13/2022
Client Project ID: 31402220.002 Westchester County Airport
York Project (SDG) No.: 22D0978

Revision No. 1.0

CT Cert. No. PH-0723

New Jersey Cert. No. CT005 and NY037



New York Cert. Nos. 10854 and 12058

PA Cert. No. 68-04440

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132-02 89th AVENUE
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RICHMOND HILL, NY 11418
ClientServices@yorklab.com

Report Date: 05/13/2022
Client Project ID: 31402220.002 Westchester County Airport
York Project (SDG) No.: 22D0978

WSP USA, Inc. (White Plains, NY)
500 Summit Lake Drive, Suite 450
Valhalla NY, 10595
Attention: John Benvegna

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on April 20, 2022 and listed below. The project was identified as your project: **31402220.002 Westchester County Airport**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

<u>York Sample ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>
22D0978-01	P1 (0-4)	Soil	04/19/2022	04/20/2022
22D0978-02	P2 (0-4)	Soil	04/19/2022	04/20/2022
22D0978-03	P3 (0-4)	Soil	04/19/2022	04/20/2022
22D0978-04	P4 (0-4)	Soil	04/19/2022	04/20/2022

General Notes for York Project (SDG) No.: 22D0978

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By: 

Date: 05/13/2022

Cassie L. Mosher
Laboratory Manager





Sample Information

Client Sample ID: P1 (0-4)

York Sample ID: 22D0978-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22D0978	31402220.002 Westchester County Airport	Soil	April 19, 2022 9:45 am	04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
2991-50-6	* N-EtFOSAA	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
2355-31-9	* N-MeFOSAA	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	0.416		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
72629-94-8	* Perfluorotridecanoic acid (PFTTrDA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ug/kg dry	0.281	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:20	WL
Surrogate Recoveries		Result	Acceptance Range							
Surrogate: M3PFBS		75.2 %	25-150							



Sample Information

Client Sample ID: P1 (0-4)

York Sample ID: 22D0978-01

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 9:45 am

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: M5PFHxA	71.6 %			25-150					
	Surrogate: M4PFHpA	89.0 %			25-150					
	Surrogate: M3PFHxS	84.9 %			25-150					
	Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	66.0 %			25-150					
	Surrogate: M6PFDA	64.3 %			25-150					
	Surrogate: M7PFUdA	67.3 %			25-150					
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	64.1 %			25-150					
	Surrogate: M2PFTeDA	52.9 %			10-150					
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	74.5 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	62.5 %			25-150					
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	68.1 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	52.9 %			10-150					
	Surrogate: d3-N-MeFOSAA	77.5 %			25-150					
	Surrogate: d5-N-EtFOSAA	95.4 %			25-150					
	Surrogate: M2-6:2 FTS	135 %			25-200					
	Surrogate: M2-8:2 FTS	157 %			25-200					
	Surrogate: M9PFNA	61.2 %			25-150					

PFAS, SPLP NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3535A/1312-modified-PFAS

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	2.53		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	3.43	PF-CCV -H, PF-LCS -H	ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	9.13		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	2.09		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL



Sample Information

Client Sample ID: P1 (0-4)

York Sample ID: 22D0978-01

<u>York Project (SDG) No.</u> 22D0978	<u>Client Project ID</u> 31402220.002 Westchester County Airport	<u>Matrix</u> Soil	<u>Collection Date/Time</u> April 19, 2022 9:45 am	<u>Date Received</u> 04/20/2022
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PFAS, SPLP NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3535A/1312-modified-PFAS

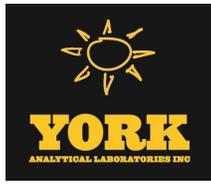
CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
72629-94-8	* Perfluorotridecanoic acid (PFTTrDA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
2355-31-9	* N-MeFOSAA	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
2991-50-6	* N-EtFOSAA	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	2.64		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ng/L	5.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	2.85		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 22:22	WL

Surrogate Recoveries

Result

Acceptance Range

Surrogate: M3PFBS	114 %	25-150
Surrogate: M5PFHxA	103 %	25-150
Surrogate: M4PFHpA	122 %	25-150
Surrogate: M3PFHxS	119 %	25-150
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PF OA)	110 %	25-150
Surrogate: M6PFDA	102 %	25-150
Surrogate: M7PFUDA	83.9 %	25-150
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	85.3 %	25-150
Surrogate: M2PFTeDA	85.0 %	10-150
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	124 %	25-150
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	133 %	25-150



Sample Information

Client Sample ID: P1 (0-4)

York Sample ID: 22D0978-01

<u>York Project (SDG) No.</u> 22D0978	<u>Client Project ID</u> 31402220.002 Westchester County Airport	<u>Matrix</u> Soil	<u>Collection Date/Time</u> April 19, 2022 9:45 am	<u>Date Received</u> 04/20/2022
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PFAS, SPLP NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3535A/1312-modified-PFAS

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	99.8 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	16.1 %			10-150					
	Surrogate: d3-N-MeFOSAA	46.1 %			25-150					
	Surrogate: d5-N-EtFOSAA	88.3 %			25-150					
	Surrogate: M2-6:2 FTS	110 %			25-150					
	Surrogate: M2-8:2 FTS	228 %	PFSu-H		25-150					
	Surrogate: M9PFNA	113 %			25-150					

Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	* % Solids	84.4		%	0.100	1	SM 2540G Certifications: CTDOH	04/27/2022 09:27	04/27/2022 13:26	VR

SPLP Extraction for PFAS 1312

Log-in Notes:

Sample Notes: EXT-Temp

Sample Prepared by Method: EPA SW 846-1312 SPLP Extraction for PFAS

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	SPLP Extraction	Completed	HT-04	N/A	1.00	1	EPA 1312 Certifications: CTDOH,NELAC-NY10854,NJDEP,PADEP	05/09/2022 14:57	05/10/2022 10:19	TAJ

Sample Information

Client Sample ID: P2 (0-4)

York Sample ID: 22D0978-02

<u>York Project (SDG) No.</u> 22D0978	<u>Client Project ID</u> 31402220.002 Westchester County Airport	<u>Matrix</u> Soil	<u>Collection Date/Time</u> April 19, 2022 10:45 am	<u>Date Received</u> 04/20/2022
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PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL



Sample Information

Client Sample ID: P2 (0-4)

York Sample ID: 22D0978-02

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 10:45 am

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
2991-50-6	* N-EtFOSAA	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
2355-31-9	* N-MeFOSAA	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	0.501		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
72629-94-8	* Perfluorotridecanoic acid (PFTTrDA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ug/kg dry	0.263	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:33	WL
Surrogate Recoveries		Result	Acceptance Range							
Surrogate: M3PFBS		70.3 %	25-150							
Surrogate: M5PFHxA		72.8 %	25-150							
Surrogate: M4PFHpA		87.6 %	25-150							
Surrogate: M3PFHxS		78.3 %	25-150							
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)		74.8 %	25-150							
Surrogate: M6PFDA		70.2 %	25-150							



Sample Information

Client Sample ID: P2 (0-4)

York Sample ID: 22D0978-02

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 10:45 am

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: M7PFUdA	64.3 %			25-150					
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	66.9 %			25-150					
	Surrogate: M2PFTeDA	42.9 %			10-150					
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	74.2 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	63.4 %			25-150					
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	70.8 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	54.8 %			10-150					
	Surrogate: d3-N-MeFOSAA	66.4 %			25-150					
	Surrogate: d5-N-EtFOSAA	84.6 %			25-150					
	Surrogate: M2-6:2 FTS	74.6 %			25-200					
	Surrogate: M2-8:2 FTS	102 %			25-200					
	Surrogate: M9PFNA	65.7 %			25-150					

PFAS, SPLP NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3535A/1312-modified-PFAS

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	4.22	PF-CCV -H, PF-LCS -H	ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	4.86		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	3.98		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
72629-94-8	* Perfluorotridecanoic acid (PFTrDA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL



Sample Information

Client Sample ID: P2 (0-4)

York Sample ID: 22D0978-02

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 10:45 am

04/20/2022

PFAS, SPLP NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3535A/1312-modified-PFAS

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
2355-31-9	* N-MeFOSAA	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
2991-50-6	* N-EtFOSAA	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ng/L	5.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	ND		ng/L	2.00	1	EPA 537m Certifications:	05/11/2022 11:33	05/11/2022 23:01	WL

Surrogate Recoveries

Result

Acceptance Range

Surrogate: M3PFBS	114 %	25-150
Surrogate: M5PFHxA	106 %	25-150
Surrogate: M4PFHpA	123 %	25-150
Surrogate: M3PFHxS	117 %	25-150
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	108 %	25-150
Surrogate: M6PFDA	112 %	25-150
Surrogate: M7PFUDA	104 %	25-150
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	102 %	25-150
Surrogate: M2PFTeDA	85.7 %	10-150
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	105 %	25-150
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	109 %	25-150
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	102 %	25-150
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	42.6 %	10-150
Surrogate: d3-N-MeFOSAA	88.1 %	25-150
Surrogate: d5-N-EtFOSAA	119 %	25-150
Surrogate: M2-6:2 FTS	86.0 %	25-150



Sample Information

Client Sample ID: P2 (0-4)

York Sample ID: 22D0978-02

York Project (SDG) No. 22D0978 Client Project ID 31402220.002 Westchester County Airport Matrix Soil Collection Date/Time April 19, 2022 10:45 am Date Received 04/20/2022

PFAS, SPLP NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: EPA 3535A/1312-modified-PFAS

Table with 11 columns: CAS No., Parameter, Result, Flag, Units, Reported to LOQ, Dilution, Reference Method, Date/Time Prepared, Date/Time Analyzed, Analyst. Rows include Surrogate: M2-8:2 FTS and Surrogate: M9PFNA.

Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

Table with 11 columns: CAS No., Parameter, Result, Flag, Units, Reported to LOQ, Dilution, Reference Method, Date/Time Prepared, Date/Time Analyzed, Analyst. Row for % Solids with result 90.6.

SPLP Extraction for PFAS 1312

Log-in Notes:

Sample Notes: EXT-Temp

Sample Prepared by Method: EPA SW 846-1312 SPLP Extraction for PFAS

Table with 11 columns: CAS No., Parameter, Result, Flag, Units, Reported to LOQ, Dilution, Reference Method, Date/Time Prepared, Date/Time Analyzed, Analyst. Row for SPLP Extraction with result Completed.

Sample Information

Client Sample ID: P3 (0-4)

York Sample ID: 22D0978-03

York Project (SDG) No. 22D0978 Client Project ID 31402220.002 Westchester County Airport Matrix Soil Collection Date/Time April 19, 2022 11:45 am Date Received 04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

Table with 11 columns: CAS No., Parameter, Result, Flag, Units, Reported to LOQ, Dilution, Reference Method, Date/Time Prepared, Date/Time Analyzed, Analyst. Rows list various PFAS compounds like Perfluorodecanesulfonic acid and Perfluorooctanesulfonic acid.



Sample Information

Client Sample ID: P3 (0-4)

York Sample ID: 22D0978-03

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 11:45 am

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	0.312		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
72629-94-8	* Perfluorotridecanoic acid (PFTrDA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ug/kg dry	0.292	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 02:59	WL

Surrogate Recoveries

Result

Acceptance Range

Surrogate: M3PFBS	75.4 %	25-150
Surrogate: M5PFHxA	74.4 %	25-150
Surrogate: M4PFHpA	89.1 %	25-150
Surrogate: M3PFHxS	79.6 %	25-150
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	75.7 %	25-150
Surrogate: M6PFDA	69.2 %	25-150
Surrogate: M7PFUDA	62.5 %	25-150
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	66.4 %	25-150
Surrogate: M2PFTeDA	49.4 %	10-150
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	78.7 %	25-150



Sample Information

Client Sample ID: P3 (0-4)					York Sample ID: 22D0978-03
<u>York Project (SDG) No.</u> 22D0978	<u>Client Project ID</u> 31402220.002 Westchester County Airport	<u>Matrix</u> Soil	<u>Collection Date/Time</u> April 19, 2022 11:45 am	<u>Date Received</u> 04/20/2022	

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	64.1 %			25-150					
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	74.8 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	54.5 %			10-150					
	Surrogate: d3-N-MeFOSAA	67.3 %			25-150					
	Surrogate: d5-N-EtFOSAA	82.9 %			25-150					
	Surrogate: M2-6:2 FTS	74.6 %			25-200					
	Surrogate: M2-8:2 FTS	98.2 %			25-200					
	Surrogate: M9PFNA	72.9 %			25-150					

Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	* % Solids	84.7		%	0.100	1	SM 2540G Certifications: CTDOH	04/27/2022 09:27	04/27/2022 13:26	VR

Sample Information

Client Sample ID: P4 (0-4)					York Sample ID: 22D0978-04
<u>York Project (SDG) No.</u> 22D0978	<u>Client Project ID</u> 31402220.002 Westchester County Airport	<u>Matrix</u> Soil	<u>Collection Date/Time</u> April 19, 2022 2:40 pm	<u>Date Received</u> 04/20/2022	

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
2991-50-6	* N-EtFOSAA	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
2355-31-9	* N-MeFOSAA	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL



Sample Information

Client Sample ID: P4 (0-4)

York Sample ID: 22D0978-04

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D0978

31402220.002 Westchester County Airport

Soil

April 19, 2022 2:40 pm

04/20/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
72629-94-8	* Perfluorotridecanoic acid (PFTTrDA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ug/kg dry	0.280	1	EPA 537m Certifications:	04/22/2022 12:26	04/29/2022 03:12	WL

Surrogate Recoveries

Result

Acceptance Range

Surrogate: M3PFBS	75.4 %	25-150
Surrogate: M5PFHxA	71.8 %	25-150
Surrogate: M4PFHpA	94.5 %	25-150
Surrogate: M3PFHxS	79.7 %	25-150
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	72.2 %	25-150
Surrogate: M6PFDA	71.9 %	25-150
Surrogate: M7PFUDA	66.1 %	25-150
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	63.9 %	25-150
Surrogate: M2PFTeDA	44.3 %	10-150



Sample Information

Client Sample ID: P4 (0-4)

York Sample ID: 22D0978-04

<u>York Project (SDG) No.</u> 22D0978	<u>Client Project ID</u> 31402220.002 Westchester County Airport	<u>Matrix</u> Soil	<u>Collection Date/Time</u> April 19, 2022 2:40 pm	<u>Date Received</u> 04/20/2022
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PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	75.4 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	67.9 %			25-150					
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	73.9 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	57.7 %			10-150					
	Surrogate: d3-N-MeFOSAA	69.0 %			25-150					
	Surrogate: d5-N-EtFOSAA	79.7 %			25-150					
	Surrogate: M2-6:2 FTS	76.5 %			25-200					
	Surrogate: M2-8:2 FTS	90.3 %			25-200					
	Surrogate: M9PFNA	79.0 %			25-150					

Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	* % Solids	86.8		%	0.100	1	SM 2540G	04/22/2022 15:16	04/22/2022 15:21	YR
							Certifications:	CTDOH		



Analytical Batch Summary

Batch ID: BD21377 **Preparation Method:** SPE PFAS Extraction-Soil-EPA 537m **Prepared By:** WEL

YORK Sample ID	Client Sample ID	Preparation Date
22D0978-01	P1 (0-4)	04/22/22
22D0978-02	P2 (0-4)	04/22/22
22D0978-03	P3 (0-4)	04/22/22
22D0978-04	P4 (0-4)	04/22/22
BD21377-BLK1	Blank	04/22/22
BD21377-BS1	LCS	04/22/22
BD21377-MS1	Matrix Spike	04/22/22
BD21377-MSD1	Matrix Spike Dup	04/22/22

Batch ID: BD21403 **Preparation Method:** % Solids Prep **Prepared By:** YR

YORK Sample ID	Client Sample ID	Preparation Date
22D0978-04	P4 (0-4)	04/22/22
BD21403-DUP1	Duplicate	04/22/22

Batch ID: BD21612 **Preparation Method:** % Solids Prep **Prepared By:** VR

YORK Sample ID	Client Sample ID	Preparation Date
22D0978-01	P1 (0-4)	04/27/22
22D0978-02	P2 (0-4)	04/27/22
22D0978-03	P3 (0-4)	04/27/22
BD21612-DUP1	Duplicate	04/27/22

Batch ID: BE20486 **Preparation Method:** EPA SW 846-1312 SPLP Extraction fc **Prepared By:** TAJ

YORK Sample ID	Client Sample ID	Preparation Date
22D0978-01	P1 (0-4)	05/09/22
22D0978-02	P2 (0-4)	05/09/22
BE20486-BLK1	Blank	05/09/22

Batch ID: BE20631 **Preparation Method:** EPA 3535A/1312-modified-PFAS **Prepared By:** WEL

YORK Sample ID	Client Sample ID	Preparation Date
22D0978-01	P1 (0-4)	05/11/22
22D0978-02	P2 (0-4)	05/11/22
BE20631-BLK1	Blank	05/11/22
BE20631-BLK2	Blank	05/11/22
BE20631-BS1	LCS	05/11/22
BE20631-BSD1	LCS Dup	05/11/22
BE20631-DUP1	Duplicate	05/11/22



PFAS Target compounds by LC/MS-MS - Quality Control Data
York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BD21377 - SPE PFAS Extraction-Soil-EPA 537m

Blank (BD21377-BLK1)

Prepared: 04/22/2022 Analyzed: 04/29/2022

1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND	0.232	ug/kg wet								
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND	0.232	"								
N-EtFOSAA	ND	0.232	"								
N-MeFOSAA	ND	0.232	"								
Perfluoro-1-decanesulfonic acid (PFDS)	ND	0.232	"								
Perfluoro-1-heptanesulfonic acid (PFHpS)	ND	0.232	"								
Perfluoro-1-octanesulfonamide (FOSA)	ND	0.232	"								
Perfluorobutanesulfonic acid (PFBS)	ND	0.232	"								
Perfluorodecanoic acid (PFDA)	ND	0.232	"								
Perfluorododecanoic acid (PFDoA)	ND	0.232	"								
Perfluoroheptanoic acid (PFHpA)	ND	0.232	"								
Perfluorohexanesulfonic acid (PFHxS)	ND	0.232	"								
Perfluorohexanoic acid (PFHxA)	ND	0.232	"								
Perfluoro-n-butanoic acid (PFBA)	ND	0.232	"								
Perfluorononanoic acid (PFNA)	ND	0.232	"								
Perfluorooctanesulfonic acid (PFOS)	ND	0.232	"								
Perfluorooctanoic acid (PFOA)	ND	0.232	"								
Perfluoropentanoic acid (PFPeA)	ND	0.232	"								
Perfluorotetradecanoic acid (PFTA)	ND	0.232	"								
Perfluorotridecanoic acid (PFTTrDA)	ND	0.232	"								
Perfluoroundecanoic acid (PFUnA)	ND	0.232	"								
Surrogate: M3PFBS	3.17		"	4.31		73.6	25-150				
Surrogate: M5PFHxA	3.33		"	4.64		71.7	25-150				
Surrogate: M4PFHpA	4.20		"	4.64		90.5	25-150				
Surrogate: M3PFHxS	3.74		"	4.39		85.1	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	3.48		"	4.64		74.9	25-150				
Surrogate: M6PFDA	3.36		"	4.64		72.4	25-150				
Surrogate: M7PFUdA	3.27		"	4.64		70.4	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.05		"	4.64		65.7	25-150				
Surrogate: M2PFTeDA	2.78		"	4.64		59.9	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	3.52		"	4.64		75.8	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.19		"	4.44		71.8	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	3.34		"	4.64		72.0	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	2.71		"	4.64		58.4	10-150				
Surrogate: d3-N-MeFOSAA	3.58		"	4.64		77.1	25-150				
Surrogate: d5-N-EtFOSAA	3.78		"	4.64		81.5	25-150				
Surrogate: M2-6:2 FTS	3.66		"	4.41		83.0	25-200				
Surrogate: M2-8:2 FTS	5.11		"	4.45		115	25-200				
Surrogate: M9PFNA	3.95		"	4.64		85.0	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BD21377 - SPE PFAS Extraction-Soil-EPA 537m

LCS (BD21377-BS1)

Prepared: 04/22/2022 Analyzed: 04/29/2022

1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	5.13	0.242	ug/kg wet	4.65		110	50-200				
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	3.90	0.242	"	4.61		84.7	50-200				
N-EtFOSAA	4.84	0.242	"	4.85		99.9	50-130				
N-MeFOSAA	4.84	0.242	"	4.85		99.9	50-130				
Perfluoro-1-decanesulfonic acid (PFDS)	4.80	0.242	"	4.68		103	50-130				
Perfluoro-1-heptanesulfonic acid (PFHpS)	5.35	0.242	"	4.63		116	50-130				
Perfluoro-1-octanesulfonamide (FOSA)	5.70	0.242	"	4.85		118	50-130				
Perfluorobutanesulfonic acid (PFBS)	4.58	0.242	"	4.29		107	50-130				
Perfluorodecanoic acid (PFDA)	5.50	0.242	"	4.85		113	50-130				
Perfluorododecanoic acid (PFDoA)	5.17	0.242	"	4.85		107	50-130				
Perfluoroheptanoic acid (PFHpA)	4.70	0.242	"	4.85		97.0	50-130				
Perfluorohexanesulfonic acid (PFHxS)	5.87	0.242	"	4.41		133	50-130	High Bias			
Perfluorohexanoic acid (PFHxA)	5.40	0.242	"	4.85		111	50-130				
Perfluoro-n-butanoic acid (PFBA)	5.45	0.242	"	4.85		112	50-130				
Perfluorononanoic acid (PFNA)	5.74	0.242	"	4.85		118	50-130				
Perfluorooctanesulfonic acid (PFOS)	4.91	0.242	"	4.48		109	50-130				
Perfluorooctanoic acid (PFOA)	5.62	0.242	"	4.85		116	50-130				
Perfluoropentanoic acid (PFPeA)	5.65	0.242	"	4.85		117	50-130				
Perfluorotetradecanoic acid (PFTA)	5.81	0.242	"	4.85		120	50-130				
Perfluorotridecanoic acid (PFTrDA)	5.22	0.242	"	4.85		108	50-130				
Perfluoroundecanoic acid (PFUnA)	5.99	0.242	"	4.85		124	50-130				
Surrogate: M3PFBS	3.53		"	4.50		78.5	25-150				
Surrogate: M5PFHxA	3.59		"	4.85		74.0	25-150				
Surrogate: M4PFHpA	4.52		"	4.85		93.3	25-150				
Surrogate: M3PFHxS	3.64		"	4.59		79.5	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	3.94		"	4.85		81.3	25-150				
Surrogate: M6PFDA	3.67		"	4.85		75.6	25-150				
Surrogate: M7PFUdA	3.28		"	4.85		67.7	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.45		"	4.85		71.1	25-150				
Surrogate: M2PFTeDA	2.90		"	4.85		59.8	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	3.78		"	4.85		78.1	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.60		"	4.64		77.6	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	3.57		"	4.85		73.5	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	3.22		"	4.85		66.4	10-150				
Surrogate: d3-N-MeFOSAA	3.61		"	4.85		74.5	25-150				
Surrogate: d5-N-EtFOSAA	4.23		"	4.85		87.2	25-150				
Surrogate: M2-6:2 FTS	4.53		"	4.60		98.4	25-200				
Surrogate: M2-8:2 FTS	4.81		"	4.64		104	25-200				
Surrogate: M9PFNA	3.74		"	4.85		77.1	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BD21377 - SPE PFAS Extraction-Soil-EPA 537m

Matrix Spike (BD21377-MS1)	*Source sample: 22D1076-02 (Matrix Spike)						Prepared: 04/22/2022 Analyzed: 04/29/2022	
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	6.11	0.279	ug/kg dry	5.36	ND	114	25-200	
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	5.01	0.279	"	5.31	ND	94.4	25-200	
N-EtFOSAA	6.17	0.279	"	5.59	ND	111	25-150	
N-MeFOSAA	6.92	0.279	"	5.59	ND	124	25-150	
Perfluoro-1-decanesulfonic acid (PFDS)	5.51	0.279	"	5.39	ND	102	25-150	
Perfluoro-1-heptanesulfonic acid (PFHpS)	6.92	0.279	"	5.33	ND	130	25-150	
Perfluoro-1-octanesulfonamide (FOSA)	6.74	0.279	"	5.59	ND	121	25-150	
Perfluorobutanesulfonic acid (PFBS)	5.22	0.279	"	4.94	ND	106	25-150	
Perfluorodecanoic acid (PFDA)	5.69	0.279	"	5.59	ND	102	25-150	
Perfluorododecanoic acid (PFDoA)	6.03	0.279	"	5.59	ND	108	25-150	
Perfluoroheptanoic acid (PFHpA)	5.68	0.279	"	5.59	ND	102	25-150	
Perfluorohexanesulfonic acid (PFHxS)	6.06	0.279	"	5.08	ND	119	25-150	
Perfluorohexanoic acid (PFHxA)	6.21	0.279	"	5.59	ND	111	25-150	
Perfluoro-n-butanoic acid (PFBA)	6.45	0.279	"	5.59	0.400	108	25-150	
Perfluorononanoic acid (PFNA)	6.11	0.279	"	5.59	ND	109	25-150	
Perfluorooctanesulfonic acid (PFOS)	6.64	0.279	"	5.17	0.526	118	25-150	
Perfluorooctanoic acid (PFOA)	6.64	0.279	"	5.59	ND	119	25-150	
Perfluoropentanoic acid (PFPeA)	6.46	0.279	"	5.59	ND	116	25-150	
Perfluorotetradecanoic acid (PFTA)	6.46	0.279	"	5.59	ND	116	25-150	
Perfluorotridecanoic acid (PFTrDA)	6.13	0.279	"	5.59	ND	110	25-150	
Perfluoroundecanoic acid (PFUnA)	6.33	0.279	"	5.59	ND	113	25-150	
Surrogate: M3PFBS	4.06		"	5.19		78.3	25-150	
Surrogate: M5PFHxA	4.23		"	5.59		75.7	25-150	
Surrogate: M4PFHpA	5.09		"	5.59		91.1	25-150	
Surrogate: M3PFHxS	4.57		"	5.28		86.5	25-150	
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	4.52		"	5.59		81.0	25-150	
Surrogate: M6PFDA	4.37		"	5.59		78.2	25-150	
Surrogate: M7PFUdA	3.72		"	5.59		66.7	25-150	
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.47		"	5.59		62.2	25-150	
Surrogate: M2PFTeDA	2.45		"	5.59		43.9	10-150	
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	4.38		"	5.59		78.4	25-150	
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.77		"	5.34		70.5	25-150	
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	4.14		"	5.59		74.1	25-150	
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	3.32		"	5.59		59.5	10-150	
Surrogate: d3-N-MeFOSAA	3.80		"	5.59		68.1	25-150	
Surrogate: d5-N-EtFOSAA	4.71		"	5.59		84.4	25-150	
Surrogate: M2-6:2 FTS	6.77		"	5.30		128	25-200	
Surrogate: M2-8:2 FTS	7.13		"	5.35		133	25-200	
Surrogate: M9PFNA	4.43		"	5.59		79.3	25-150	



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BD21377 - SPE PFAS Extraction-Soil-EPA 537m											
Matrix Spike Dup (BD21377-MSD1)	*Source sample: 22D1076-02 (Matrix Spike Dup)						Prepared: 04/22/2022 Analyzed: 04/29/2022				
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	5.49	0.263	ug/kg dry	5.05	ND	109	25-200		10.8	35	
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	4.62	0.263	"	5.00	ND	92.6	25-200		8.00	35	
N-EtFOSAA	5.95	0.263	"	5.26	ND	113	25-150		3.76	35	
N-MeFOSAA	5.61	0.263	"	5.26	ND	107	25-150		20.9	35	
Perfluoro-1-decanesulfonic acid (PFDS)	5.60	0.263	"	5.07	ND	110	25-150		1.65	35	
Perfluoro-1-heptanesulfonic acid (PFHpS)	7.84	0.263	"	5.02	ND	156	25-150	High Bias	12.4	35	
Perfluoro-1-octanesulfonamide (FOSA)	6.04	0.263	"	5.26	ND	115	25-150		11.0	35	
Perfluorobutanesulfonic acid (PFBS)	5.12	0.263	"	4.65	ND	110	25-150		2.01	35	
Perfluorodecanoic acid (PFDA)	5.95	0.263	"	5.26	ND	113	25-150		4.40	35	
Perfluorododecanoic acid (PFDoA)	5.71	0.263	"	5.26	ND	109	25-150		5.52	35	
Perfluoroheptanoic acid (PFHpA)	5.56	0.263	"	5.26	ND	106	25-150		2.28	35	
Perfluorohexanesulfonic acid (PFHxS)	5.98	0.263	"	4.79	ND	125	25-150		1.22	35	
Perfluorohexanoic acid (PFHxA)	5.97	0.263	"	5.26	ND	113	25-150		4.01	35	
Perfluoro-n-butanoic acid (PFBA)	6.04	0.263	"	5.26	0.400	107	25-150		6.45	35	
Perfluorononanoic acid (PFNA)	6.23	0.263	"	5.26	ND	118	25-150		1.94	35	
Perfluorooctanesulfonic acid (PFOS)	6.87	0.263	"	4.86	0.526	130	25-150		3.32	35	
Perfluorooctanoic acid (PFOA)	6.50	0.263	"	5.26	ND	124	25-150		2.14	35	
Perfluoropentanoic acid (PFPeA)	6.02	0.263	"	5.26	ND	115	25-150		6.93	35	
Perfluorotetradecanoic acid (PFTA)	6.00	0.263	"	5.26	ND	114	25-150		7.24	35	
Perfluorotridecanoic acid (PFTrDA)	6.56	0.263	"	5.26	ND	125	25-150		6.69	35	
Perfluoroundecanoic acid (PFUnA)	6.26	0.263	"	5.26	ND	119	25-150		1.01	35	
Surrogate: M3PFBS	3.84		"	4.89		78.6	25-150				
Surrogate: M5PFHxA	4.01		"	5.26		76.3	25-150				
Surrogate: M4PFHpA	4.66		"	5.26		88.6	25-150				
Surrogate: M3PFHxS	4.17		"	4.97		83.8	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	4.19		"	5.26		79.7	25-150				
Surrogate: M6PFDA	3.94		"	5.26		74.9	25-150				
Surrogate: M7PFUdA	3.54		"	5.26		67.2	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.40		"	5.26		64.7	25-150				
Surrogate: M2PFTeDA	2.71		"	5.26		51.5	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	4.13		"	5.26		78.6	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.18		"	5.03		63.3	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	3.93		"	5.26		74.7	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	3.18		"	5.26		60.6	10-150				
Surrogate: d3-N-MeFOSAA	3.98		"	5.26		75.8	25-150				
Surrogate: d5-N-EtFOSAA	4.58		"	5.26		87.1	25-150				
Surrogate: M2-6:2 FTS	6.85		"	4.99		137	25-200				
Surrogate: M2-8:2 FTS	7.82		"	5.04		155	25-200				
Surrogate: M9PFNA	3.97		"	5.26		75.5	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BE20631 - EPA 3535A/1312-modified-PFAS

Blank (BE20631-BLK1)

Prepared & Analyzed: 05/11/2022

Perfluorobutanesulfonic acid (PFBS)	ND	2.00	ng/L								
Perfluorohexanoic acid (PFHxA)	ND	2.00	"								
Perfluoroheptanoic acid (PFHpA)	ND	2.00	"								
Perfluorohexanesulfonic acid (PFHxS)	ND	2.00	"								
Perfluorooctanoic acid (PFOA)	ND	2.00	"								
Perfluorooctanesulfonic acid (PFOS)	ND	2.00	"								
Perfluorononanoic acid (PFNA)	ND	2.00	"								
Perfluorodecanoic acid (PFDA)	ND	2.00	"								
Perfluoroundecanoic acid (PFUnA)	ND	2.00	"								
Perfluorododecanoic acid (PFDoA)	ND	2.00	"								
Perfluorotridecanoic acid (PFTriDA)	ND	2.00	"								
Perfluorotetradecanoic acid (PFTA)	ND	2.00	"								
N-MeFOSAA	ND	2.00	"								
N-EtFOSAA	ND	2.00	"								
Perfluoropentanoic acid (PFPeA)	ND	2.00	"								
Perfluoro-1-octanesulfonamide (FOSA)	ND	2.00	"								
Perfluoro-1-heptanesulfonic acid (PFHpS)	ND	2.00	"								
Perfluoro-1-decanesulfonic acid (PFDS)	ND	2.00	"								
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND	5.00	"								
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND	2.00	"								
Perfluoro-n-butanoic acid (PFBA)	ND	2.00	"								
Surrogate: M3PFBS	92.2		"	74.3		124	25-150				
Surrogate: M5PFHxA	105		"	80.0		131	25-150				
Surrogate: M4PFHpA	122		"	80.0		152	25-150				
Surrogate: M3PFHxS	96.2		"	75.7		127	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	106		"	80.0		132	25-150				
Surrogate: M6PFDA	106		"	80.0		132	25-150				
Surrogate: M7PFUdA	99.0		"	80.0		124	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	87.1		"	80.0		109	25-150				
Surrogate: M2PFTeDA	71.4		"	80.0		89.3	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	107		"	80.0		134	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	98.8		"	76.6		129	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	98.2		"	80.0		123	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	63.3		"	80.0		79.1	10-150				
Surrogate: d3-N-MeFOSAA	83.8		"	80.0		105	25-150				
Surrogate: d5-N-EtFOSAA	91.6		"	80.0		115	25-150				
Surrogate: M2-6:2 FTS	81.4		"	75.9		107	25-150				
Surrogate: M2-8:2 FTS	101		"	76.6		132	25-150				
Surrogate: M9PFNA	106		"	80.0		133	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BE20631 - EPA 3535A/1312-modified-PFAS

Blank (BE20631-BLK2)

Prepared & Analyzed: 05/11/2022

Perfluorobutanesulfonic acid (PFBS)	ND	2.00	ng/L								
Perfluorohexanoic acid (PFHxA)	ND	2.00	"								
Perfluoroheptanoic acid (PFHpA)	ND	2.00	"								
Perfluorohexanesulfonic acid (PFHxS)	ND	2.00	"								
Perfluorooctanoic acid (PFOA)	ND	2.00	"								
Perfluorooctanesulfonic acid (PFOS)	ND	2.00	"								
Perfluorononanoic acid (PFNA)	ND	2.00	"								
Perfluorodecanoic acid (PFDA)	ND	2.00	"								
Perfluoroundecanoic acid (PFUnA)	ND	2.00	"								
Perfluorododecanoic acid (PFDoA)	ND	2.00	"								
Perfluorotridecanoic acid (PFTriDA)	ND	2.00	"								
Perfluorotetradecanoic acid (PFTA)	ND	2.00	"								
N-MeFOSAA	ND	2.00	"								
N-EtFOSAA	ND	2.00	"								
Perfluoropentanoic acid (PFPeA)	ND	2.00	"								
Perfluoro-1-octanesulfonamide (FOSA)	ND	2.00	"								
Perfluoro-1-heptanesulfonic acid (PFHpS)	ND	2.00	"								
Perfluoro-1-decanesulfonic acid (PFDS)	ND	2.00	"								
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND	5.00	"								
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND	2.00	"								
Perfluoro-n-butanoic acid (PFBA)	ND	2.00	"								
Surrogate: M3PFBS	87.3		"	74.3		118	25-150				
Surrogate: M5PFHxA	83.6		"	80.0		105	25-150				
Surrogate: M4PFHpA	100		"	80.0		125	25-150				
Surrogate: M3PFHxS	85.8		"	75.7		113	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	81.8		"	80.0		102	25-150				
Surrogate: M6PFDA	86.8		"	80.0		108	25-150				
Surrogate: M7PFUdA	84.2		"	80.0		105	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	80.5		"	80.0		101	25-150				
Surrogate: M2PFTeDA	69.6		"	80.0		87.1	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	86.8		"	80.0		108	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	85.0		"	76.6		111	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	80.6		"	80.0		101	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	59.8		"	80.0		74.8	10-150				
Surrogate: d3-N-MeFOSAA	78.3		"	80.0		97.8	25-150				
Surrogate: d5-N-EtFOSAA	74.8		"	80.0		93.5	25-150				
Surrogate: M2-6:2 FTS	79.9		"	75.9		105	25-150				
Surrogate: M2-8:2 FTS	76.8		"	76.6		100	25-150				
Surrogate: M9PFNA	88.7		"	80.0		111	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BE20631 - EPA 3535A/1312-modified-PFAS

LCS (BE20631-BS1)

Prepared & Analyzed: 05/11/2022

Perfluorobutanesulfonic acid (PFBS)	81.4	2.00	ng/L	70.8		115	50-130				
Perfluorohexanoic acid (PFHxA)	85.6	2.00	"	80.0		107	50-130				
Perfluoroheptanoic acid (PFHpA)	73.4	2.00	"	80.0		91.8	50-130				
Perfluorohexanesulfonic acid (PFHxS)	102	2.00	"	72.8		141	50-130	High Bias			
Perfluorooctanoic acid (PFOA)	92.2	2.00	"	80.0		115	50-130				
Perfluorooctanesulfonic acid (PFOS)	71.3	2.00	"	74.0		96.3	50-130				
Perfluorononanoic acid (PFNA)	86.1	2.00	"	80.0		108	50-130				
Perfluorodecanoic acid (PFDA)	82.9	2.00	"	80.0		104	50-130				
Perfluoroundecanoic acid (PFUnA)	77.8	2.00	"	80.0		97.3	50-130				
Perfluorododecanoic acid (PFDoA)	82.2	2.00	"	80.0		103	50-130				
Perfluorotridecanoic acid (PFTriDA)	81.4	2.00	"	80.0		102	50-130				
Perfluorotetradecanoic acid (PFTA)	94.7	2.00	"	80.0		118	50-130				
N-MeFOSAA	79.8	2.00	"	80.0		99.8	50-130				
N-EtFOSAA	74.4	2.00	"	80.0		93.0	50-130				
Perfluoropentanoic acid (PFPeA)	84.4	2.00	"	80.0		106	50-130				
Perfluoro-1-octanesulfonamide (FOSA)	94.0	2.00	"	80.0		118	50-130				
Perfluoro-1-heptanesulfonic acid (PFHpS)	73.1	2.00	"	76.4		95.6	50-130				
Perfluoro-1-decanesulfonic acid (PFDS)	67.9	2.00	"	77.2		88.0	50-130				
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	103	5.00	"	76.0		136	50-130	High Bias			
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	86.1	2.00	"	76.8		112	50-130				
Perfluoro-n-butanoic acid (PFBA)	85.8	2.00	"	80.0		107	50-130				
Surrogate: M3PFBS	79.0		"	74.3		106	25-150				
Surrogate: M5PFHxA	88.2		"	80.0		110	25-150				
Surrogate: M4PFHpA	102		"	80.0		128	25-150				
Surrogate: M3PFHxS	80.2		"	75.7		106	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	85.2		"	80.0		107	25-150				
Surrogate: M6PFDA	86.0		"	80.0		108	25-150				
Surrogate: M7PFUdA	89.1		"	80.0		111	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	82.6		"	80.0		103	25-150				
Surrogate: M2PFTeDA	63.8		"	80.0		79.7	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	93.9		"	80.0		117	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	95.5		"	76.6		125	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	89.1		"	80.0		111	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	58.6		"	80.0		73.2	10-150				
Surrogate: d3-N-MeFOSAA	79.6		"	80.0		99.5	25-150				
Surrogate: d5-N-EtFOSAA	75.4		"	80.0		94.2	25-150				
Surrogate: M2-6:2 FTS	69.1		"	75.9		91.0	25-150				
Surrogate: M2-8:2 FTS	74.3		"	76.6		96.9	25-150				
Surrogate: M9PFNA	89.5		"	80.0		112	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BE20631 - EPA 3535A/1312-modified-PFAS											
LCS Dup (BE20631-BSD1)											
Prepared & Analyzed: 05/11/2022											
Perfluorobutanesulfonic acid (PFBS)	69.4	2.00	ng/L	70.8		98.0	50-130		15.9	30	
Perfluorohexanoic acid (PFHxA)	77.5	2.00	"	80.0		96.9	50-130		9.97	30	
Perfluoroheptanoic acid (PFHpA)	71.0	2.00	"	80.0		88.8	50-130		3.32	30	
Perfluorohexanesulfonic acid (PFHxS)	94.4	2.00	"	72.8		130	50-130		8.12	30	
Perfluorooctanoic acid (PFOA)	85.2	2.00	"	80.0		106	50-130		7.96	30	
Perfluorooctanesulfonic acid (PFOS)	67.0	2.00	"	74.0		90.6	50-130		6.14	30	
Perfluorononanoic acid (PFNA)	83.7	2.00	"	80.0		105	50-130		2.81	30	
Perfluorodecanoic acid (PFDA)	78.9	2.00	"	80.0		98.6	50-130		4.88	30	
Perfluoroundecanoic acid (PFUnA)	78.4	2.00	"	80.0		98.1	50-130		0.814	30	
Perfluorododecanoic acid (PFDoA)	80.5	2.00	"	80.0		101	50-130		2.09	30	
Perfluorotridecanoic acid (PFTriDA)	78.3	2.00	"	80.0		97.8	50-130		3.88	30	
Perfluorotetradecanoic acid (PFTA)	84.6	2.00	"	80.0		106	50-130		11.3	30	
N-MeFOSAA	77.3	2.00	"	80.0		96.6	50-130		3.22	30	
N-EtFOSAA	78.5	2.00	"	80.0		98.2	50-130		5.42	30	
Perfluoropentanoic acid (PFPeA)	78.9	2.00	"	80.0		98.6	50-130		6.77	30	
Perfluoro-1-octanesulfonamide (FOSA)	89.8	2.00	"	80.0		112	50-130		4.63	30	
Perfluoro-1-heptanesulfonic acid (PFHpS)	72.1	2.00	"	76.4		94.4	50-130		1.26	30	
Perfluoro-1-decanesulfonic acid (PFDS)	63.5	2.00	"	77.2		82.2	50-130		6.73	30	
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	78.4	5.00	"	76.0		103	50-130		27.5	30	
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	66.9	2.00	"	76.8		87.2	50-130		25.0	30	
Perfluoro-n-butanoic acid (PFBA)	80.5	2.00	"	80.0		101	50-130		6.33	30	
Surrogate: M3PFBS	91.3		"	74.3		123	25-150				
Surrogate: M5PFHxA	95.2		"	80.0		119	25-150				
Surrogate: M4PFHpA	105		"	80.0		131	25-150				
Surrogate: M3PFHxS	87.4		"	75.7		115	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	90.7		"	80.0		113	25-150				
Surrogate: M6PFDA	88.8		"	80.0		111	25-150				
Surrogate: M7PFUdA	87.1		"	80.0		109	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	80.3		"	80.0		100	25-150				
Surrogate: M2PFTeDA	66.8		"	80.0		83.5	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	99.8		"	80.0		125	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	98.6		"	76.6		129	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	94.8		"	80.0		119	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	50.7		"	80.0		63.4	10-150				
Surrogate: d3-N-MeFOSAA	76.4		"	80.0		95.5	25-150				
Surrogate: d5-N-EtFOSAA	70.7		"	80.0		88.4	25-150				
Surrogate: M2-6:2 FTS	81.3		"	75.9		107	25-150				
Surrogate: M2-8:2 FTS	86.8		"	76.6		113	25-150				
Surrogate: M9PFNA	87.6		"	80.0		109	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BE20631 - EPA 3535A/1312-modified-PFAS											
Duplicate (BE20631-DUP1)	*Source sample: 22D0978-01 (P1 (0-4))						Prepared & Analyzed: 05/11/2022				
Perfluorobutanesulfonic acid (PFBS)	0.568	2.00	ng/L		ND					30	
Perfluorohexanoic acid (PFHxA)	2.62	2.00	"		2.53				3.78	30	
Perfluoroheptanoic acid (PFHpA)	1.70	2.00	"		1.83				7.46	30	
Perfluorohexanesulfonic acid (PFHxS)	2.86	2.00	"		3.43				18.2	30	
Perfluorooctanoic acid (PFOA)	10.1	2.00	"		9.13				10.1	30	
Perfluorooctanesulfonic acid (PFOS)	3.20	2.00	"		2.09				41.9	30	Non-dir.
Perfluorononanoic acid (PFNA)	2.10	2.00	"		1.82				14.1	30	
Perfluorodecanoic acid (PFDA)	ND	2.00	"		ND					30	
Perfluoroundecanoic acid (PFUnA)	ND	2.00	"		ND					30	
Perfluorododecanoic acid (PFDoA)	ND	2.00	"		ND					30	
Perfluorotridecanoic acid (PFTeDA)	ND	2.00	"		ND					30	
Perfluorotetradecanoic acid (PFTA)	ND	2.00	"		ND					30	
N-MeFOSAA	ND	2.00	"		ND					30	
N-EtFOSAA	0.867	2.00	"		1.20				32.4	30	Non-dir.
Perfluoropentanoic acid (PFPeA)	2.96	2.00	"		2.64				11.5	30	
Perfluoro-1-octanesulfonamide (FOSA)	ND	2.00	"		ND					30	
Perfluoro-1-heptanesulfonic acid (PFHpS)	ND	2.00	"		ND					30	
Perfluoro-1-decanesulfonic acid (PFDS)	ND	2.00	"		ND					30	
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND	5.00	"		ND					30	
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND	2.00	"		ND					30	
Perfluoro-n-butanoic acid (PFBA)	2.99	2.00	"		2.85				4.76	30	
Surrogate: M3PFBS	86.3		"	74.3		116	25-150				
Surrogate: M5PFHxA	85.7		"	80.0		107	25-150				
Surrogate: M4PFHpA	105		"	80.0		132	25-150				
Surrogate: M3PFHxS	88.6		"	75.7		117	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	86.9		"	80.0		109	25-150				
Surrogate: M6PFDA	77.6		"	80.0		97.0	25-150				
Surrogate: M7PFUdA	64.2		"	80.0		80.3	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	69.7		"	80.0		87.2	25-150				
Surrogate: M2PFTeDA	66.7		"	80.0		83.4	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	97.7		"	80.0		122	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	97.0		"	76.6		127	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	79.4		"	80.0		99.2	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	20.1		"	80.0		25.2	10-150				
Surrogate: d3-N-MeFOSAA	36.0		"	80.0		45.0	25-150				
Surrogate: d5-N-EtFOSAA	67.1		"	80.0		83.8	25-150				
Surrogate: M2-6:2 FTS	83.4		"	75.9		110	25-150				
Surrogate: M2-8:2 FTS	157		"	76.6		205	25-150				
Surrogate: M9PFNA	90.8		"	80.0		114	25-150				



Miscellaneous Physical Parameters - Quality Control Data
York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BD21403 - % Solids Prep

Duplicate (BD21403-DUP1)	*Source sample: 22D0884-01 (Duplicate)						Prepared & Analyzed: 04/22/2022					
% Solids	93.4	0.100	%		93.6				0.217	20		

Batch BD21612 - % Solids Prep

Duplicate (BD21612-DUP1)	*Source sample: 22D1244-05 (Duplicate)						Prepared & Analyzed: 04/27/2022					
% Solids	85.8	0.100	%		85.8				0.00804	20		



Leachate Preparations - Quality Control Data
York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BE20486 - EPA SW 846-1312 SPLP Extraction for PFAS

Blank (BE20486-BLK1)

Prepared: 05/09/2022 Analyzed: 05/10/2022

SPLP Extraction	Completed	1.00	N/A								
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Sample and Data Qualifiers Relating to This Work Order

QR-02	The RPD result exceeded the QC control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
PFSu-H	The isotopically labeled surrogate recovered above lab control limits due to a matrix effect. Isotope Dilution was applied.
PF-LCS-H	The LCS recovery was slightly above acceptable limits for the qualified compound. However, sample results are not biased high because results are corrected for isotope recovery.
PF-CCV-H	The CCV recovery was slightly above acceptable limits for the qualified compound. However, sample results are not biased high because results are corrected for isotope recovery.
HT-04	NON-COMPLIANT- Client requested analysis be conducted outside of holding times.
EXT-Temp	Extraction temperature slightly exceeded acceptance range.
EXT-COMP	Completed

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.



If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.

Revision Description: This report has been revised to report SPLP activations.



Field Chain-of-Custody Record

York Analytical Laboratories, Inc. (YORK)'s Standard Terms & Conditions are listed on the back side of this document. This document serves as your written authorization for YORK to proceed with the analyses requested below. Your signature binds you to YORK's Standard Terms & Conditions.

120 Research Drive Stratford, CT 06615

132-02 89th Ave Queens, NY 11418

clientservices@yorklab.com www.yorklab.com

800-306-YORK 800-306-9675

Page 1 of 1

YORK Project No. 2210978

YOUR Information		Report To:		Invoice To:		YOUR Project Number		Turn-Around Time	
Company: WSP	Address: 500 SUMMIT LAKE DR VALHALLA, NY	Company: SAME	Address: SAME	Company: SAME	Address: SAME	31402220.002	RUSH - Next Day	RUSH - Next Day	
Phone: 914 561 2951	Contact: JOHN. BENVENAGRO WSP.COM	Phone: SAME	Contact: SAME	Phone: SAME	Contact: SAME	YOUR Project Name: WESTCHESTER COUNTY AIRPORT	RUSH - Two Day	RUSH - Three Day	
E-mail:		E-mail:		E-mail:		YOUR PO#: 31402220.002	RUSH - Four Day	Standard (5-7 Day)	X

Please print clearly and legibly. All information must be complete. Samples will not be logged in and the turn-around-time clock will not begin until any questions by YORK are resolved.

MICHAEL G DEFELICE
Michael G Defelice

Samples Collected by: (print AND sign your name)

Sample Identification	Matrix Codes	Samples From		Report / EDD Type (circle selections)	YORK Reg. Comp.
		New York	Other:		
P1 (0-4)	S	New York	Other:	CT RCP	2-A-4-5-1c, VNR
P2 (0-4)	S	New Jersey	Other:	CT RCP DOA/DUE EQUIS (Standard)	
P3 (0-4)	S	Connecticut	Other:	NY ASP A Package	
P4 (0-4)	S	Pennsylvania	Other:	NY ASP B Package	
				NJDEP Reduced Deliverables	
				NJDEP SRP HazSite	
				NJDQKP	
				Other:	
				Analysis Requested	
				TOTAL PFAS & SPLP PFAS*	
				TOTAL PFAS	

Comments: * PLEASE RUN SPLP IF PROA OR PFOS IS > 1 ppb

NOTE!

Samples iced/chilled at time of lab pickup? circle Yes or No		Date/Time	
1. Samples Relinquished by / Company	Chie York 4-20-22	8:50	4/20/22
2. Samples Relinquished by / Company	Chie York 4-20-22	15:21	4/20/22
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100. Samples Relinquished by / Company			



Technical Report

prepared for:

WSP USA, Inc. (White Plains, NY)
500 Summit Lake Drive, Suite 450
Valhalla NY, 10595
Attention: John Benvegna

Report Date: 05/03/2022
Client Project ID: 31402220.002 Westchester County Airport (WCA)
York Project (SDG) No.: 22D1041

CT Cert. No. PH-0723

New Jersey Cert. No. CT005 and NY037



New York Cert. Nos. 10854 and 12058

PA Cert. No. 68-04440

120 RESEARCH DRIVE
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STRATFORD, CT 06615
(203) 325-1371

132-02 89th AVENUE
FAX (203) 357-0166

RICHMOND HILL, NY 11418
ClientServices@yorklab.com

Report Date: 05/03/2022
Client Project ID: 31402220.002 Westchester County Airport (WCA)
York Project (SDG) No.: 22D1041

WSP USA, Inc. (White Plains, NY)
500 Summit Lake Drive, Suite 450
Valhalla NY, 10595
Attention: John Benvegna

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on April 21, 2022 and listed below. The project was identified as your project: **31402220.002 Westchester County Airport (WCA)**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

<u>York Sample ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>
22D1041-01	P5 (0-4)	Soil	04/20/2022	04/21/2022

General Notes for York Project (SDG) No.: 22D1041

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By: 

Date: 05/03/2022

Cassie L. Mosher
Laboratory Manager





Sample Information

Client Sample ID: P5 (0-4)

York Sample ID: 22D1041-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22D1041	31402220.002 Westchester County Airport (WCA)	Soil	April 20, 2022 9:00 am	04/21/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
2991-50-6	* N-EtFOSAA	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
2355-31-9	* N-MeFOSAA	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	1.11		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
375-95-1	* Perfluorononanoic acid (PFNA)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
72629-94-8	* Perfluorotridecanoic acid (PFTTrDA)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ug/kg dry	0.284	1	EPA 537m Certifications:	04/25/2022 11:52	05/02/2022 22:59	WL

Surrogate Recoveries	Result	Acceptance Range
Surrogate: M3PFBS	74.3 %	25-150



Sample Information

Client Sample ID: P5 (0-4)

York Sample ID: 22D1041-01

<u>York Project (SDG) No.</u> 22D1041	<u>Client Project ID</u> 31402220.002 Westchester County Airport (WCA)	<u>Matrix</u> Soil	<u>Collection Date/Time</u> April 20, 2022 9:00 am	<u>Date Received</u> 04/21/2022
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PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE PFAS Extraction-Soil-EPA 537m

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: M5PFHxA	71.2 %			25-150					
	Surrogate: M4PFHpA	92.6 %			25-150					
	Surrogate: M3PFHxS	80.5 %			25-150					
	Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	71.9 %			25-150					
	Surrogate: M6PFDA	67.8 %			25-150					
	Surrogate: M7PFUdA	57.7 %			25-150					
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	58.4 %			25-150					
	Surrogate: M2PFTeDA	55.3 %			10-150					
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	76.4 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	73.0 %			25-150					
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	69.4 %			25-150					
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	56.3 %			10-150					
	Surrogate: d3-N-MeFOSAA	74.3 %			25-150					
	Surrogate: d5-N-EtFOSAA	92.8 %			25-150					
	Surrogate: M2-6:2 FTS	128 %			25-200					
	Surrogate: M2-8:2 FTS	136 %			25-200					
	Surrogate: M9PFNA	72.5 %			25-150					

Total Solids

Log-in Notes:

Sample Notes:

Sample Prepared by Method: % Solids Prep

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
solids	* % Solids	86.8		%	0.100	1	SM 2540G Certifications: CTDOH	04/28/2022 09:46	04/28/2022 14:21	VR



Analytical Batch Summary

Batch ID: BD21465 **Preparation Method:** SPE PFAS Extraction-Soil-EPA 537m **Prepared By:** WEL

YORK Sample ID	Client Sample ID	Preparation Date
22D1041-01	P5 (0-4)	04/25/22
BD21465-BLK1	Blank	04/25/22
BD21465-BS1	LCS	04/25/22
BD21465-MS1	Matrix Spike	04/25/22
BD21465-MSD1	Matrix Spike Dup	04/25/22

Batch ID: BD21692 **Preparation Method:** % Solids Prep **Prepared By:** VR

YORK Sample ID	Client Sample ID	Preparation Date
22D1041-01	P5 (0-4)	04/28/22
BD21692-DUP1	Duplicate	04/28/22



PFAS Target compounds by LC/MS-MS - Quality Control Data
York Analytical Laboratories, Inc.

Analyte	Result	Reporting	Units	Spike Level	Source*	%REC	%REC	Flag	RPD	RPD	Limit	Flag
		Limit			Result	Limits	Limit					

Batch BD21465 - SPE PFAS Extraction-Soil-EPA 537m

Blank (BD21465-BLK1)

Prepared: 04/25/2022 Analyzed: 05/02/2022

1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND	0.249	ug/kg wet									
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND	0.249	"									
N-EtFOSAA	ND	0.249	"									
N-MeFOSAA	ND	0.249	"									
Perfluoro-1-decanesulfonic acid (PFDS)	ND	0.249	"									
Perfluoro-1-heptanesulfonic acid (PFHpS)	ND	0.249	"									
Perfluoro-1-octanesulfonamide (FOSA)	ND	0.249	"									
Perfluorobutanesulfonic acid (PFBS)	ND	0.249	"									
Perfluorodecanoic acid (PFDA)	ND	0.249	"									
Perfluorododecanoic acid (PFDoA)	ND	0.249	"									
Perfluoroheptanoic acid (PFHpA)	ND	0.249	"									
Perfluorohexanesulfonic acid (PFHxS)	ND	0.249	"									
Perfluorohexanoic acid (PFHxA)	ND	0.249	"									
Perfluoro-n-butanoic acid (PFBA)	ND	0.249	"									
Perfluorononanoic acid (PFNA)	ND	0.249	"									
Perfluorooctanesulfonic acid (PFOS)	ND	0.249	"									
Perfluorooctanoic acid (PFOA)	ND	0.249	"									
Perfluoropentanoic acid (PFPeA)	ND	0.249	"									
Perfluorotetradecanoic acid (PFTA)	ND	0.249	"									
Perfluorotridecanoic acid (PFTTrDA)	ND	0.249	"									
Perfluoroundecanoic acid (PFUnA)	ND	0.249	"									
Surrogate: M3PFBS	3.63		"	4.62		78.6	25-150					
Surrogate: M5PFHxA	3.82		"	4.97		76.8	25-150					
Surrogate: M4PFHpA	4.79		"	4.97		96.3	25-150					
Surrogate: M3PFHxS	3.92		"	4.70		83.3	25-150					
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	3.96		"	4.97		79.6	25-150					
Surrogate: M6PFDA	4.05		"	4.97		81.4	25-150					
Surrogate: M7PFUdA	3.70		"	4.97		74.4	25-150					
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.47		"	4.97		69.8	25-150					
Surrogate: M2PFTeDA	3.30		"	4.97		66.4	10-150					
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	4.00		"	4.97		80.6	25-150					
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.87		"	4.76		81.4	25-150					
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	3.69		"	4.97		74.2	25-150					
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	3.28		"	4.97		66.0	10-150					
Surrogate: d3-N-MeFOSAA	3.89		"	4.97		78.2	25-150					
Surrogate: d5-N-EtFOSAA	4.56		"	4.97		91.7	25-150					
Surrogate: M2-6:2 FTS	4.28		"	4.72		90.8	25-200					
Surrogate: M2-8:2 FTS	5.70		"	4.76		120	25-200					
Surrogate: M9PFNA	4.09		"	4.97		82.3	25-150					



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BD21465 - SPE PFAS Extraction-Soil-EPA 537m

LCS (BD21465-BS1)

Prepared: 04/25/2022 Analyzed: 05/02/2022

1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	4.82	0.239	ug/kg wet	4.60		105	50-200				
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	4.18	0.239	"	4.55		92.0	50-200				
N-EtFOSAA	4.76	0.239	"	4.79		99.4	50-130				
N-MeFOSAA	4.78	0.239	"	4.79		99.9	50-130				
Perfluoro-1-decanesulfonic acid (PFDS)	3.83	0.239	"	4.62		82.9	50-130				
Perfluoro-1-heptanesulfonic acid (PFHpS)	4.80	0.239	"	4.57		105	50-130				
Perfluoro-1-octanesulfonamide (FOSA)	4.61	0.239	"	4.79		96.3	50-130				
Perfluorobutanesulfonic acid (PFBS)	4.15	0.239	"	4.24		98.1	50-130				
Perfluorodecanoic acid (PFDA)	5.00	0.239	"	4.79		104	50-130				
Perfluorododecanoic acid (PFDoA)	4.66	0.239	"	4.79		97.3	50-130				
Perfluoroheptanoic acid (PFHpA)	3.92	0.239	"	4.79		81.8	50-130				
Perfluorohexanesulfonic acid (PFHxS)	5.07	0.239	"	4.36		116	50-130				
Perfluorohexanoic acid (PFHxA)	4.83	0.239	"	4.79		101	50-130				
Perfluoro-n-butanoic acid (PFBA)	4.90	0.239	"	4.79		102	50-130				
Perfluorononanoic acid (PFNA)	4.83	0.239	"	4.79		101	50-130				
Perfluorooctanesulfonic acid (PFOS)	4.32	0.239	"	4.43		97.5	50-130				
Perfluorooctanoic acid (PFOA)	5.17	0.239	"	4.79		108	50-130				
Perfluoropentanoic acid (PFPeA)	4.96	0.239	"	4.79		104	50-130				
Perfluorotetradecanoic acid (PFTA)	5.00	0.239	"	4.79		104	50-130				
Perfluorotridecanoic acid (PFTrDA)	3.94	0.239	"	4.79		82.2	50-130				
Perfluoroundecanoic acid (PFUnA)	4.77	0.239	"	4.79		99.7	50-130				
Surrogate: M3PFBS	3.35		"	4.45		75.4	25-150				
Surrogate: M5PFHxA	3.56		"	4.79		74.5	25-150				
Surrogate: M4PFHpA	4.58		"	4.79		95.7	25-150				
Surrogate: M3PFHxS	3.47		"	4.53		76.5	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	3.63		"	4.79		75.9	25-150				
Surrogate: M6PFDA	3.33		"	4.79		69.6	25-150				
Surrogate: M7PFUdA	3.46		"	4.79		72.4	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.28		"	4.79		68.6	25-150				
Surrogate: M2PFTeDA	3.04		"	4.79		63.5	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	3.63		"	4.79		75.9	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.58		"	4.58		78.2	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	3.48		"	4.79		72.7	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	3.11		"	4.79		65.0	10-150				
Surrogate: d3-N-MeFOSAA	3.49		"	4.79		73.0	25-150				
Surrogate: d5-N-EtFOSAA	3.48		"	4.79		72.6	25-150				
Surrogate: M2-6:2 FTS	3.53		"	4.54		77.7	25-200				
Surrogate: M2-8:2 FTS	3.73		"	4.59		81.4	25-200				
Surrogate: M9PFNA	3.87		"	4.79		80.8	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BD21465 - SPE PFAS Extraction-Soil-EPA 537m

Matrix Spike (BD21465-MS1)	*Source sample: 22D1042-01 (Matrix Spike)							Prepared: 04/25/2022 Analyzed: 05/02/2022		
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	5.84	0.284	ug/kg dry	5.44	ND	107	25-200			
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	4.66	0.284	"	5.39	ND	86.5	25-200			
N-EtFOSAA	5.06	0.284	"	5.67	ND	89.3	25-150			
N-MeFOSAA	5.80	0.284	"	5.67	ND	102	25-150			
Perfluoro-1-decanesulfonic acid (PFDS)	4.87	0.284	"	5.47	ND	88.9	25-150			
Perfluoro-1-heptanesulfonic acid (PFHpS)	5.54	0.284	"	5.42	ND	102	25-150			
Perfluoro-1-octanesulfonamide (FOSA)	5.60	0.284	"	5.67	ND	98.7	25-150			
Perfluorobutanesulfonic acid (PFBS)	4.85	0.284	"	5.02	ND	96.6	25-150			
Perfluorodecanoic acid (PFDA)	5.19	0.284	"	5.67	ND	91.5	25-150			
Perfluorododecanoic acid (PFDoA)	5.04	0.284	"	5.67	ND	88.8	25-150			
Perfluoroheptanoic acid (PFHpA)	4.89	0.284	"	5.67	ND	86.3	25-150			
Perfluorohexanesulfonic acid (PFHxS)	5.52	0.284	"	5.16	0.327	101	25-150			
Perfluorohexanoic acid (PFHxA)	5.55	0.284	"	5.67	0.295	92.7	25-150			
Perfluoro-n-butanoic acid (PFBA)	5.92	0.284	"	5.67	0.470	96.0	25-150			
Perfluorononanoic acid (PFNA)	5.73	0.284	"	5.67	ND	101	25-150			
Perfluorooctanesulfonic acid (PFOS)	4.97	0.284	"	5.25	0.668	82.1	25-150			
Perfluorooctanoic acid (PFOA)	6.46	0.284	"	5.67	1.27	91.5	25-150			
Perfluoropentanoic acid (PFPeA)	5.74	0.284	"	5.67	ND	101	25-150			
Perfluorotetradecanoic acid (PFTA)	5.46	0.284	"	5.67	ND	96.2	25-150			
Perfluorotridecanoic acid (PFTrDA)	4.90	0.284	"	5.67	0.366	79.9	25-150			
Perfluoroundecanoic acid (PFUnA)	5.44	0.284	"	5.67	ND	95.9	25-150			
Surrogate: M3PFBS	4.02		"	5.27		76.2	25-150			
Surrogate: M5PFHxA	4.05		"	5.67		71.4	25-150			
Surrogate: M4PFHpA	4.49		"	5.67		79.1	25-150			
Surrogate: M3PFHxS	3.88		"	5.37		72.4	25-150			
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	3.74		"	5.67		66.0	25-150			
Surrogate: M6PFDA	3.58		"	5.67		63.2	25-150			
Surrogate: M7PFUdA	3.42		"	5.67		60.3	25-150			
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.67		"	5.67		64.6	25-150			
Surrogate: M2PFTeDA	2.99		"	5.67		52.8	10-150			
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	3.99		"	5.67		70.3	25-150			
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.71		"	5.43		68.4	25-150			
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	3.90		"	5.67		68.8	25-150			
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	3.12		"	5.67		55.0	10-150			
Surrogate: d3-N-MeFOSAA	3.96		"	5.67		69.9	25-150			
Surrogate: d5-N-EtFOSAA	4.75		"	5.67		83.8	25-150			
Surrogate: M2-6:2 FTS	8.91		"	5.38		165	25-200			
Surrogate: M2-8:2 FTS	7.98		"	5.43		147	25-200			
Surrogate: M9PFNA	3.25		"	5.67		57.4	25-150			



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BD21465 - SPE PFAS Extraction-Soil-EPA 537m											
Matrix Spike Dup (BD21465-MSD1)	*Source sample: 22D1042-01 (Matrix Spike Dup)						Prepared: 04/25/2022 Analyzed: 05/02/2022				
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	6.05	0.295	ug/kg dry	5.66	ND	107	25-200		3.62	35	
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	4.78	0.295	"	5.61	ND	85.3	25-200		2.60	35	
N-EtFOSAA	5.28	0.295	"	5.90	ND	89.5	25-150		4.22	35	
N-MeFOSAA	5.26	0.295	"	5.90	ND	89.2	25-150		9.66	35	
Perfluoro-1-decanesulfonic acid (PFDS)	6.56	0.295	"	5.69	ND	115	25-150		29.6	35	
Perfluoro-1-heptanesulfonic acid (PFHpS)	7.13	0.295	"	5.63	ND	126	25-150		25.1	35	
Perfluoro-1-octanesulfonamide (FOSA)	6.64	0.295	"	5.90	ND	113	25-150		17.0	35	
Perfluorobutanesulfonic acid (PFBS)	5.20	0.295	"	5.22	ND	99.6	25-150		7.09	35	
Perfluorodecanoic acid (PFDA)	5.36	0.295	"	5.90	ND	90.9	25-150		3.31	35	
Perfluorododecanoic acid (PFDoA)	4.77	0.295	"	5.90	ND	80.8	25-150		5.49	35	
Perfluoroheptanoic acid (PFHpA)	4.95	0.295	"	5.90	ND	84.0	25-150		1.27	35	
Perfluorohexanesulfonic acid (PFHxS)	6.57	0.295	"	5.37	0.327	116	25-150		17.3	35	
Perfluorohexanoic acid (PFHxA)	5.87	0.295	"	5.90	ND	99.5	25-150		5.56	35	
Perfluoro-n-butanoic acid (PFBA)	6.19	0.295	"	5.90	0.470	96.9	25-150		4.49	35	
Perfluorononanoic acid (PFNA)	5.63	0.295	"	5.90	ND	95.4	25-150		1.79	35	
Perfluorooctanesulfonic acid (PFOS)	6.59	0.295	"	5.46	0.668	109	25-150		28.0	35	
Perfluorooctanoic acid (PFOA)	7.20	0.295	"	5.90	1.27	100	25-150		10.8	35	
Perfluoropentanoic acid (PFPeA)	6.01	0.295	"	5.90	ND	102	25-150		4.65	35	
Perfluorotetradecanoic acid (PFTA)	5.75	0.295	"	5.90	ND	97.4	25-150		5.19	35	
Perfluorotridecanoic acid (PFTrDA)	4.52	0.295	"	5.90	0.366	70.4	25-150		8.05	35	
Perfluoroundecanoic acid (PFUnA)	6.02	0.295	"	5.90	ND	102	25-150		10.2	35	
Surrogate: M3PFBS	4.13		"	5.48		75.4	25-150				
Surrogate: M5PFHxA	4.29		"	5.90		72.7	25-150				
Surrogate: M4PFHpA	4.99		"	5.90		84.6	25-150				
Surrogate: M3PFHxS	4.30		"	5.58		77.0	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	3.94		"	5.90		66.8	25-150				
Surrogate: M6PFDA	3.76		"	5.90		63.7	25-150				
Surrogate: M7PFUdA	3.66		"	5.90		62.0	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	3.83		"	5.90		64.9	25-150				
Surrogate: M2PFTeDA	2.63		"	5.90		44.6	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	4.29		"	5.90		72.7	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	3.05		"	5.65		54.0	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	4.18		"	5.90		70.8	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	2.83		"	5.90		47.9	10-150				
Surrogate: d3-N-MeFOSAA	4.63		"	5.90		78.5	25-150				
Surrogate: d5-N-EtFOSAA	5.21		"	5.90		88.4	25-150				
Surrogate: M2-6:2 FTS	9.60		"	5.60		172	25-200				
Surrogate: M2-8:2 FTS	8.15		"	5.65		144	25-200				
Surrogate: M9PFNA	3.57		"	5.90		60.5	25-150				



Miscellaneous Physical Parameters - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BD21692 - % Solids Prep

Duplicate (BD21692-DUP1)	*Source sample: 22D1280-01 (Duplicate)						Prepared & Analyzed: 04/28/2022					
% Solids	85.6	0.100	%		85.5				0.118	20		



Sample and Data Qualifiers Relating to This Work Order

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.



Technical Report

prepared for:

WSP USA, Inc. (White Plains, NY)
500 Summit Lake Drive, Suite 450
Valhalla NY, 10595
Attention: John Benvegna

Report Date: 05/04/2022

Client Project ID: 31402220.002 Westchester Co. Airport (WCA)
York Project (SDG) No.: 22D1116

CT Cert. No. PH-0723

New Jersey Cert. No. CT005 and NY037



New York Cert. Nos. 10854 and 12058

PA Cert. No. 68-04440

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RICHMOND HILL, NY 11418
ClientServices@yorklab.com

Report Date: 05/04/2022
Client Project ID: 31402220.002 Westchester Co. Airport (WCA)
York Project (SDG) No.: 22D1116

WSP USA, Inc. (White Plains, NY)
500 Summit Lake Drive, Suite 450
Valhalla NY, 10595
Attention: John Benvegna

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on April 22, 2022 and listed below. The project was identified as your project: **31402220.002 Westchester Co. Airport (WCA)**.

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables.

All samples were received in proper condition meeting the customary acceptance requirements for environmental samples except those indicated under the Sample and Analysis Qualifiers section of this report.

All analyses met the method and laboratory standard operating procedure requirements except as indicated by any data flags, the meaning of which are explained in the Sample and Data Qualifiers Relating to This Work Order section of this report and case narrative if applicable.

The results of the analyses, which are all reported on dry weight basis (soils) unless otherwise noted, are detailed in the following pages.

Please contact Client Services at 203.325.1371 with any questions regarding this report.

<u>York Sample ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>
22D1116-01	P1 GW	Water	04/21/2022	04/22/2022
22D1116-02	P2 GW	Water	04/21/2022	04/22/2022
22D1116-03	P3 GW	Water	04/21/2022	04/22/2022
22D1116-04	P4 GW	Water	04/21/2022	04/22/2022
22D1116-05	P5 GW	Water	04/21/2022	04/22/2022

General Notes for York Project (SDG) No.: 22D1116

1. The RLs and MDLs (Reporting Limit and Method Detection Limit respectively) reported are adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference. The RL(REPORTING LIMIT) is based upon the lowest standard utilized for the calibration where applicable.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All analyses conducted met method or Laboratory SOP requirements. See the Sample and Data Qualifiers Section for further information.
6. It is noted that no analyses reported herein were subcontracted to another laboratory, unless noted in the report.
7. This report reflects results that relate only to the samples submitted on the attached chain-of-custody form(s) received by York.
8. Analyses conducted at York Analytical Laboratories, Inc. Stratford, CT are indicated by NY Cert. No. 10854; those conducted at York Analytical Laboratories, Inc., Richmond Hill, NY are indicated by NY Cert. No. 12058.

Approved By: 

Date: 05/04/2022

Cassie L. Mosher
Laboratory Manager





Sample Information

Client Sample ID: P1 GW

York Sample ID: 22D1116-01

York Project (SDG) No.	Client Project ID	Matrix	Collection Date/Time	Date Received
22D1116	31402220.002 Westchester Co. Airport (WCA)	Water	April 21, 2022 9:00 am	04/22/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ng/L	5.43	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
2991-50-6	* N-EtFOSAA	ND		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
2355-31-9	* N-MeFOSAA	ND		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	2.81		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	6.65		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	25.5		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	83.0		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	56.4		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	40.8		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
375-95-1	* Perfluorononanoic acid (PFNA)	43.9		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	75.6		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	152		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	81.2		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
72629-94-8	* Perfluorotridecanoic acid (PFTrDA)	ND		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ng/L	2.17	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:20	WL



Sample Information

Client Sample ID: P1 GW

York Sample ID: 22D1116-01

<u>York Project (SDG) No.</u> 22D1116	<u>Client Project ID</u> 31402220.002 Westchester Co. Airport (WCA)	<u>Matrix</u> Water	<u>Collection Date/Time</u> April 21, 2022 9:00 am	<u>Date Received</u> 04/22/2022
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PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
Surrogate Recoveries		Result		Acceptance Range						
	Surrogate: M3PFBS	81.5 %								
	Surrogate: M5PFHxA	74.7 %								
	Surrogate: M4PFHpA	101 %								
	Surrogate: M3PFHxS	94.6 %								
	Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	78.1 %								
	Surrogate: M6PFDA	90.8 %								
	Surrogate: M7PFUdA	88.8 %								
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	75.7 %								
	Surrogate: M2PFTeDA	82.8 %								
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	49.7 %								
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	88.3 %								
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	66.2 %								
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	31.3 %								
	Surrogate: d3-N-MeFOSAA	91.4 %								
	Surrogate: d5-N-EtFOSAA	98.8 %								
	Surrogate: M2-6:2 FTS	114 %								
	Surrogate: M2-8:2 FTS	182 %								
	Surrogate: M9PFNA	86.0 %								

Sample Information

Client Sample ID: P2 GW

York Sample ID: 22D1116-02

<u>York Project (SDG) No.</u> 22D1116	<u>Client Project ID</u> 31402220.002 Westchester Co. Airport (WCA)	<u>Matrix</u> Water	<u>Collection Date/Time</u> April 21, 2022 9:20 am	<u>Date Received</u> 04/22/2022
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PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	15.3		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	96.2		ng/L	48.1	10	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 19:48	WL



Sample Information

Client Sample ID: P2 GW

York Sample ID: 22D1116-02

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D1116

31402220.002 Westchester Co. Airport (WCA)

Water

April 21, 2022 9:20 am

04/22/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
2991-50-6	* N-EtFOSAA	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
2355-31-9	* N-MeFOSAA	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	10.7		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	27.7		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	46.2		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	360		ng/L	19.2	10	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 19:48	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	107		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	86.3		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
375-95-1	* Perfluorononanoic acid (PFNA)	11.6		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	490		ng/L	19.2	10	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 19:48	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	88.9		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	155		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
72629-94-8	* Perfluorotridecanoic acid (PFTrDA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:33	WL

Surrogate Recoveries	Result	Acceptance Range
Surrogate: M3PFBS	79.6 %	25-150
Surrogate: M3PFBS	80.0 %	25-150
Surrogate: M5PFHxA	74.5 %	25-150
Surrogate: M5PFHxA	81.7 %	25-150
Surrogate: M4PFHpA	105 %	25-150



Sample Information

Client Sample ID: P2 GW

York Sample ID: 22D1116-02

York Project (SDG) No.

Client Project ID

Matrix

Collection Date/Time

Date Received

22D1116

31402220.002 Westchester Co. Airport (WCA)

Water

April 21, 2022 9:20 am

04/22/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: M4PFHpA	84.5 %								
	Surrogate: M3PFHxS	87.9 %								
	Surrogate: M3PFHxS	96.7 %								
	Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	84.0 %								
	Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	82.0 %								
	Surrogate: M6PFDA	89.0 %								
	Surrogate: M6PFDA	97.9 %								
	Surrogate: M7PFUdA	80.2 %								
	Surrogate: M7PFUdA	92.4 %								
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	78.2 %								
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	84.5 %								
	Surrogate: M2PFTeDA	74.0 %								
	Surrogate: M2PFTeDA	92.3 %								
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	68.2 %								
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	11.4 %	PFSu-L							
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	95.4 %								
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	85.7 %								
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	42.8 %								
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	49.4 %								
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	32.6 %								
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	35.4 %								
	Surrogate: d3-N-MeFOSAA	91.2 %								
	Surrogate: d3-N-MeFOSAA	102 %								
	Surrogate: d5-N-EtFOSAA	92.8 %								
	Surrogate: d5-N-EtFOSAA	110 %								
	Surrogate: M2-6:2 FTS	115 %								
	Surrogate: M2-6:2 FTS	220 %	PFSu-H							
	Surrogate: M2-8:2 FTS	91.5 %								
	Surrogate: M2-8:2 FTS	221 %	PFSu-H							
	Surrogate: M9PFNA	81.1 %								
	Surrogate: M9PFNA	84.3 %								



Sample Information

Client Sample ID: P2 GW

York Sample ID: 22D1116-02

<u>York Project (SDG) No.</u> 22D1116	<u>Client Project ID</u> 31402220.002 Westchester Co. Airport (WCA)	<u>Matrix</u> Water	<u>Collection Date/Time</u> April 21, 2022 9:20 am	<u>Date Received</u> 04/22/2022
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Sample Information

Client Sample ID: P3 GW

York Sample ID: 22D1116-03

<u>York Project (SDG) No.</u> 22D1116	<u>Client Project ID</u> 31402220.002 Westchester Co. Airport (WCA)	<u>Matrix</u> Water	<u>Collection Date/Time</u> April 21, 2022 9:35 am	<u>Date Received</u> 04/22/2022
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PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE EXT-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ng/L	4.63	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
2991-50-6	* N-EtFOSAA	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
2355-31-9	* N-MeFOSAA	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	5.94		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	5.65		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	16.6		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	9.20		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	9.94		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
375-95-1	* Perfluorononanoic acid (PFNA)	7.81		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	19.0		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	25.0		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	12.5		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL



Sample Information

Client Sample ID: P3 GW					York Sample ID: 22D1116-03
<u>York Project (SDG) No.</u>	<u>Client Project ID</u>	<u>Matrix</u>	<u>Collection Date/Time</u>	<u>Date Received</u>	
22D1116	31402220.002 Westchester Co. Airport (WCA)	Water	April 21, 2022 9:35 am	04/22/2022	

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
72629-94-8	* Perfluorotridecanoic acid (PFTTrDA)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	2.48		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:46	WL
Surrogate Recoveries		Result			Acceptance Range					
Surrogate: M3PFBS		80.2 %			25-150					
Surrogate: M5PFHxA		77.5 %			25-150					
Surrogate: M4PFHpA		107 %			25-150					
Surrogate: M3PFHxS		101 %			25-150					
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)		83.3 %			25-150					
Surrogate: M6PFDA		94.4 %			25-150					
Surrogate: M7PFUdA		88.9 %			25-150					
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)		82.5 %			25-150					
Surrogate: M2PFTeDA		83.1 %			10-150					
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)		50.0 %			25-150					
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)		87.4 %			25-150					
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)		67.9 %			25-150					
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)		30.7 %			10-150					
Surrogate: d3-N-MeFOSAA		83.6 %			25-150					
Surrogate: d5-N-EtFOSAA		90.9 %			25-150					
Surrogate: M2-6:2 FTS		82.2 %			25-200					
Surrogate: M2-8:2 FTS		123 %			25-200					
Surrogate: M9PFNA		83.2 %			25-150					

Sample Information

Client Sample ID: P4 GW					York Sample ID: 22D1116-04
<u>York Project (SDG) No.</u>	<u>Client Project ID</u>	<u>Matrix</u>	<u>Collection Date/Time</u>	<u>Date Received</u>	
22D1116	31402220.002 Westchester Co. Airport (WCA)	Water	April 21, 2022 10:00 am	04/22/2022	

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:



Sample Information

Client Sample ID: P4 GW

York Sample ID: 22D1116-04

<u>York Project (SDG) No.</u> 22D1116	<u>Client Project ID</u> 31402220.002 Westchester Co. Airport (WCA)	<u>Matrix</u> Water	<u>Collection Date/Time</u> April 21, 2022 10:00 am	<u>Date Received</u> 04/22/2022
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Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	14.2		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	5.14		ng/L	4.63	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
2991-50-6	* N-EtFOSAA	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
2355-31-9	* N-MeFOSAA	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	3.78		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	8.81		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	43.9		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	20.5		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	15.6		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
375-95-1	* Perfluorononanoic acid (PFNA)	3.95		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	220		ng/L	9.26	5	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 20:00	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	9.34		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	43.0		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
72629-94-8	* Perfluorotridecanoic acid (PFTTrDA)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ng/L	1.85	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 16:59	WL

Surrogate Recoveries	Result	Acceptance Range
Surrogate: M3PFBS	49.1 %	25-150
Surrogate: M3PFBS	102 %	25-150
Surrogate: MSPFHxA	69.3 %	25-150



Sample Information

Client Sample ID: P4 GW

York Sample ID: 22D1116-04

<u>York Project (SDG) No.</u>	<u>Client Project ID</u>	<u>Matrix</u>	<u>Collection Date/Time</u>	<u>Date Received</u>
22D1116	31402220.002 Westchester Co. Airport (WCA)	Water	April 21, 2022 10:00 am	04/22/2022

PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: M5PFHxA	92.5 %				25-150				
	Surrogate: M4PFHpA	101 %				25-150				
	Surrogate: M4PFHpA	93.6 %				25-150				
	Surrogate: M3PFHxS	102 %				25-150				
	Surrogate: M3PFHxS	110 %				25-150				
	Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	81.3 %				25-150				
	Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	86.2 %				25-150				
	Surrogate: M6PFDA	85.1 %				25-150				
	Surrogate: M6PFDA	108 %				25-150				
	Surrogate: M7PFUdA	86.1 %				25-150				
	Surrogate: M7PFUdA	88.8 %				25-150				
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	82.9 %				25-150				
	Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	103 %				25-150				
	Surrogate: M2PFTeDA	61.7 %				10-150				
	Surrogate: M2PFTeDA	92.5 %				10-150				
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	35.4 %				25-150				
	Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	13.3 %	PFSu-L			25-150				
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	87.5 %				25-150				
	Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	112 %				25-150				
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	55.0 %				25-150				
	Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	59.8 %				25-150				
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	50.5 %				10-150				
	Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	53.8 %				10-150				
	Surrogate: d3-N-MeFOSAA	90.9 %				25-150				
	Surrogate: d3-N-MeFOSAA	111 %				25-150				
	Surrogate: d5-N-EtFOSAA	104 %				25-150				
	Surrogate: d5-N-EtFOSAA	129 %				25-150				
	Surrogate: M2-6:2 FTS	122 %				25-200				
	Surrogate: M2-6:2 FTS	232 %	PFSu-H			25-200				
	Surrogate: M2-8:2 FTS	120 %				25-200				
	Surrogate: M2-8:2 FTS	241 %	PFSu-H			25-200				



Sample Information

Client Sample ID: P4 GW

York Sample ID: 22D1116-04

<u>York Project (SDG) No.</u> 22D1116	<u>Client Project ID</u> 31402220.002 Westchester Co. Airport (WCA)	<u>Matrix</u> Water	<u>Collection Date/Time</u> April 21, 2022 10:00 am	<u>Date Received</u> 04/22/2022
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PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
	Surrogate: M9PFNA	97.6 %			25-150					
	Surrogate: M9PFNA	95.6 %			25-150					

Sample Information

Client Sample ID: P5 GW

York Sample ID: 22D1116-05

<u>York Project (SDG) No.</u> 22D1116	<u>Client Project ID</u> 31402220.002 Westchester Co. Airport (WCA)	<u>Matrix</u> Water	<u>Collection Date/Time</u> April 21, 2022 10:20 am	<u>Date Received</u> 04/22/2022
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PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
39108-34-4	* 1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
27619-97-2	* 1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND		ng/L	4.81	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
2991-50-6	* N-EtFOSAA	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
2355-31-9	* N-MeFOSAA	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
335-77-3	* Perfluoro-1-decanesulfonic acid (PFDS)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
375-92-8	* Perfluoro-1-heptanesulfonic acid (PFHpS)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
754-91-6	* Perfluoro-1-octanesulfonamide (FOSA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
375-73-5	* Perfluorobutanesulfonic acid (PFBS)	4.43		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
335-76-2	* Perfluorodecanoic acid (PFDA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
307-55-1	* Perfluorododecanoic acid (PFDoA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
375-85-9	* Perfluoroheptanoic acid (PFHpA)	4.58		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
355-46-4	* Perfluorohexanesulfonic acid (PFHxS)	5.95		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
307-24-4	* Perfluorohexanoic acid (PFHxA)	6.37		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
375-22-4	* Perfluoro-n-butanoic acid (PFBA)	15.2		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL



Sample Information

Client Sample ID: P5 GW

York Sample ID: 22D1116-05

<u>York Project (SDG) No.</u> 22D1116	<u>Client Project ID</u> 31402220.002 Westchester Co. Airport (WCA)	<u>Matrix</u> Water	<u>Collection Date/Time</u> April 21, 2022 10:20 am	<u>Date Received</u> 04/22/2022
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PFAS, NYSDEC Target List

Log-in Notes:

Sample Notes:

Sample Prepared by Method: SPE Ext-PFAS-EPA 537.1M

CAS No.	Parameter	Result	Flag	Units	Reported to LOQ	Dilution	Reference Method	Date/Time Prepared	Date/Time Analyzed	Analyst
375-95-1	* Perfluorononanoic acid (PFNA)	9.52		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
1763-23-1	* Perfluorooctanesulfonic acid (PFOS)	10.8		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
335-67-1	* Perfluorooctanoic acid (PFOA)	25.2		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
2706-90-3	* Perfluoropentanoic acid (PFPeA)	10.2		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
376-06-7	* Perfluorotetradecanoic acid (PFTA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
72629-94-8	* Perfluorotridecanoic acid (PFTrDA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL
2058-94-8	* Perfluoroundecanoic acid (PFUnA)	ND		ng/L	1.92	1	EPA 537m Certifications:	05/02/2022 13:04	05/03/2022 17:25	WL

Surrogate Recoveries

Result

Acceptance Range

Surrogate: M3PFBS	75.3 %	25-150
Surrogate: M5PFHxA	71.1 %	25-150
Surrogate: M4PFHpA	94.9 %	25-150
Surrogate: M3PFHxS	95.2 %	25-150
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	78.1 %	25-150
Surrogate: M6PFDA	84.0 %	25-150
Surrogate: M7PFUdA	80.6 %	25-150
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	75.1 %	25-150
Surrogate: M2PFTeDA	76.1 %	10-150
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	36.0 %	25-150
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	82.3 %	25-150
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	62.8 %	25-150
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	22.4 %	10-150
Surrogate: d3-N-MeFOSAA	79.0 %	25-150
Surrogate: d5-N-EtFOSAA	87.8 %	25-150
Surrogate: M2-6:2 FTS	100 %	25-200
Surrogate: M2-8:2 FTS	126 %	25-200
Surrogate: M9PFNA	83.9 %	25-150



Analytical Batch Summary

Batch ID: BE20048

Preparation Method: SPE Ext-PFAS-EPA 537.1M

Prepared By: WEL

YORK Sample ID	Client Sample ID	Preparation Date
22D1116-01	P1 GW	05/02/22
22D1116-02	P2 GW	05/02/22
22D1116-02RE1	P2 GW	05/02/22
22D1116-03	P3 GW	05/02/22
22D1116-04	P4 GW	05/02/22
22D1116-04RE1	P4 GW	05/02/22
22D1116-05	P5 GW	05/02/22
BE20048-BLK1	Blank	05/02/22
BE20048-BS1	LCS	05/02/22
BE20048-BSD1	LCS Dup	05/02/22



PFAS Target compounds by LC/MS-MS - Quality Control Data
York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BE20048 - SPE Ext-PFAS-EPA 537.1M

Blank (BE20048-BLK1)

Prepared: 05/02/2022 Analyzed: 05/03/2022

1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	ND	2.00	ng/L								
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	ND	5.00	"								
N-EtFOSAA	ND	2.00	"								
N-MeFOSAA	ND	2.00	"								
Perfluoro-1-decanesulfonic acid (PFDS)	ND	2.00	"								
Perfluoro-1-heptanesulfonic acid (PFHpS)	ND	2.00	"								
Perfluoro-1-octanesulfonamide (FOSA)	ND	2.00	"								
Perfluorobutanesulfonic acid (PFBS)	ND	2.00	"								
Perfluorodecanoic acid (PFDA)	ND	2.00	"								
Perfluorododecanoic acid (PFDoA)	ND	2.00	"								
Perfluoroheptanoic acid (PFHpA)	ND	2.00	"								
Perfluorohexanesulfonic acid (PFHxS)	ND	2.00	"								
Perfluorohexanoic acid (PFHxA)	ND	2.00	"								
Perfluoro-n-butanoic acid (PFBA)	ND	2.00	"								
Perfluorononanoic acid (PFNA)	ND	2.00	"								
Perfluorooctanesulfonic acid (PFOS)	ND	2.00	"								
Perfluorooctanoic acid (PFOA)	ND	2.00	"								
Perfluoropentanoic acid (PFPeA)	ND	2.00	"								
Perfluorotetradecanoic acid (PFTA)	ND	2.00	"								
Perfluorotridecanoic acid (PFTTrDA)	ND	2.00	"								
Perfluoroundecanoic acid (PFUnA)	ND	2.00	"								
Surrogate: M3PFBS	59.5		"	74.3		80.0	25-150				
Surrogate: M5PFHxA	65.2		"	80.0		81.5	25-150				
Surrogate: M4PFHpA	81.1		"	80.0		101	25-150				
Surrogate: M3PFHxS	71.1		"	75.7		93.9	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	63.2		"	80.0		79.0	25-150				
Surrogate: M6PFDA	66.3		"	80.0		82.9	25-150				
Surrogate: M7PFUdA	73.3		"	80.0		91.6	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	66.2		"	80.0		82.7	25-150				
Surrogate: M2PFTeDA	69.8		"	80.0		87.2	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	64.6		"	80.0		80.7	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	62.4		"	76.6		81.5	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	55.7		"	80.0		69.6	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	41.1		"	80.0		51.4	10-150				
Surrogate: d3-N-MeFOSAA	56.1		"	80.0		70.1	25-150				
Surrogate: d5-N-EtFOSAA	80.1		"	80.0		100	25-150				
Surrogate: M2-6:2 FTS	78.4		"	75.9		103	25-200				
Surrogate: M2-8:2 FTS	91.8		"	76.6		120	25-200				
Surrogate: M9PFNA	66.6		"	80.0		83.2	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
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Batch BE20048 - SPE Ext-PFAS-EPA 537.1M

LCS (BE20048-BS1)

Prepared: 05/02/2022 Analyzed: 05/03/2022

1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	82.5	2.00	ng/L	76.8		107	50-175				
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	69.4	5.00	"	76.0		91.3	50-175				
N-EtFOSAA	83.5	2.00	"	80.0		104	50-130				
N-MeFOSAA	88.2	2.00	"	80.0		110	50-130				
Perfluoro-1-decanesulfonic acid (PFDS)	75.9	2.00	"	77.2		98.4	50-130				
Perfluoro-1-heptanesulfonic acid (PFHpS)	76.2	2.00	"	76.4		99.7	50-130				
Perfluoro-1-octanesulfonamide (FOSA)	91.1	2.00	"	80.0		114	50-130				
Perfluorobutanesulfonic acid (PFBS)	75.0	2.00	"	70.8		106	50-130				
Perfluorodecanoic acid (PFDA)	80.5	2.00	"	80.0		101	50-130				
Perfluorododecanoic acid (PFDoA)	80.5	2.00	"	80.0		101	50-130				
Perfluoroheptanoic acid (PFHpA)	67.3	2.00	"	80.0		84.2	50-130				
Perfluorohexanesulfonic acid (PFHxS)	85.8	2.00	"	72.8		118	50-130				
Perfluorohexanoic acid (PFHxA)	83.3	2.00	"	80.0		104	50-130				
Perfluoro-n-butanoic acid (PFBA)	82.2	2.00	"	80.0		103	50-130				
Perfluorononanoic acid (PFNA)	78.6	2.00	"	80.0		98.2	50-130				
Perfluorooctanesulfonic acid (PFOS)	72.4	2.00	"	74.0		97.8	50-130				
Perfluorooctanoic acid (PFOA)	88.2	2.00	"	80.0		110	50-130				
Perfluoropentanoic acid (PFPeA)	93.2	2.00	"	80.0		117	50-130				
Perfluorotetradecanoic acid (PFTA)	68.1	2.00	"	80.0		85.1	50-130				
Perfluorotridecanoic acid (PFTrDA)	84.5	2.00	"	80.0		106	50-130				
Perfluoroundecanoic acid (PFUnA)	80.6	2.00	"	80.0		101	50-130				
Surrogate: M3PFBS	59.7		"	74.3		80.3	25-150				
Surrogate: M5PFHxA	66.3		"	80.0		82.9	25-150				
Surrogate: M4PFHpA	87.1		"	80.0		109	25-150				
Surrogate: M3PFHxS	66.7		"	75.7		88.1	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	70.8		"	80.0		88.5	25-150				
Surrogate: M6PFDA	77.8		"	80.0		97.3	25-150				
Surrogate: M7PFUdA	76.3		"	80.0		95.4	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	72.1		"	80.0		90.1	25-150				
Surrogate: M2PFTeDA	89.4		"	80.0		112	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	70.9		"	80.0		88.6	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	73.5		"	76.6		96.0	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	58.7		"	80.0		73.4	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	51.8		"	80.0		64.8	10-150				
Surrogate: d3-N-MeFOSAA	71.6		"	80.0		89.5	25-150				
Surrogate: d5-N-EtFOSAA	77.7		"	80.0		97.1	25-150				
Surrogate: M2-6:2 FTS	74.6		"	75.9		98.3	25-200				
Surrogate: M2-8:2 FTS	95.2		"	76.6		124	25-200				
Surrogate: M9PFNA	77.3		"	80.0		96.7	25-150				



PFAS Target compounds by LC/MS-MS - Quality Control Data

York Analytical Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source* Result	%REC	%REC Limits	Flag	RPD	RPD Limit	Flag
Batch BE20048 - SPE Ext-PFAS-EPA 537.1M											
LCS Dup (BE20048-BSD1)											
Prepared: 05/02/2022 Analyzed: 05/03/2022											
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	97.2	2.00	ng/L	76.8		127	50-175		16.3	30	
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2 FTS)	71.0	5.00	"	76.0		93.4	50-175		2.27	30	
N-EtFOSAA	73.7	2.00	"	80.0		92.2	50-130		12.4	30	
N-MeFOSAA	86.0	2.00	"	80.0		107	50-130		2.55	30	
Perfluoro-1-decanesulfonic acid (PFDS)	73.9	2.00	"	77.2		95.8	50-130		2.65	30	
Perfluoro-1-heptanesulfonic acid (PFHpS)	75.3	2.00	"	76.4		98.6	50-130		1.12	30	
Perfluoro-1-octanesulfonamide (FOSA)	94.3	2.00	"	80.0		118	50-130		3.49	30	
Perfluorobutanesulfonic acid (PFBS)	70.5	2.00	"	70.8		99.6	50-130		6.23	30	
Perfluorodecanoic acid (PFDA)	73.1	2.00	"	80.0		91.4	50-130		9.68	30	
Perfluorododecanoic acid (PFDoA)	75.8	2.00	"	80.0		94.8	50-130		5.97	30	
Perfluoroheptanoic acid (PFHpA)	66.9	2.00	"	80.0		83.6	50-130		0.668	30	
Perfluorohexanesulfonic acid (PFHxS)	81.1	2.00	"	72.8		111	50-130		5.59	30	
Perfluorohexanoic acid (PFHxA)	78.2	2.00	"	80.0		97.8	50-130		6.24	30	
Perfluoro-n-butanoic acid (PFBA)	78.7	2.00	"	80.0		98.4	50-130		4.27	30	
Perfluorononanoic acid (PFNA)	76.4	2.00	"	80.0		95.5	50-130		2.81	30	
Perfluorooctanesulfonic acid (PFOS)	68.8	2.00	"	74.0		93.0	50-130		5.06	30	
Perfluorooctanoic acid (PFOA)	78.4	2.00	"	80.0		97.9	50-130		11.8	30	
Perfluoropentanoic acid (PFPeA)	89.8	2.00	"	80.0		112	50-130		3.75	30	
Perfluorotetradecanoic acid (PFTA)	74.5	2.00	"	80.0		93.1	50-130		8.97	30	
Perfluorotridecanoic acid (PFTrDA)	92.3	2.00	"	80.0		115	50-130		8.88	30	
Perfluoroundecanoic acid (PFUnA)	83.3	2.00	"	80.0		104	50-130		3.28	30	
Surrogate: M3PFBS	61.2		"	74.3		82.3	25-150				
Surrogate: M5PFHxA	62.8		"	80.0		78.5	25-150				
Surrogate: M4PFHpA	79.8		"	80.0		99.8	25-150				
Surrogate: M3PFHxS	66.4		"	75.7		87.7	25-150				
Surrogate: Perfluoro-n-[13C8]octanoic acid (M8PFOA)	70.5		"	80.0		88.2	25-150				
Surrogate: M6PFDA	75.5		"	80.0		94.4	25-150				
Surrogate: M7PFUdA	71.6		"	80.0		89.5	25-150				
Surrogate: Perfluoro-n-[1,2-13C2]dodecanoic acid (MPFDoA)	68.1		"	80.0		85.2	25-150				
Surrogate: M2PFTeDA	68.1		"	80.0		85.1	10-150				
Surrogate: Perfluoro-n-[13C4]butanoic acid (MPFBA)	68.1		"	80.0		85.1	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonic acid (M8PFOS)	72.6		"	76.6		94.8	25-150				
Surrogate: Perfluoro-n-[13C5]pentanoic acid (M5PFPeA)	56.7		"	80.0		70.9	25-150				
Surrogate: Perfluoro-1-[13C8]octanesulfonamide (M8FOSA)	44.9		"	80.0		56.2	10-150				
Surrogate: d3-N-MeFOSAA	68.2		"	80.0		85.2	25-150				
Surrogate: d5-N-EtFOSAA	78.9		"	80.0		98.7	25-150				
Surrogate: M2-6:2 FTS	65.8		"	75.9		86.6	25-200				
Surrogate: M2-8:2 FTS	81.3		"	76.6		106	25-200				
Surrogate: M9PFNA	74.1		"	80.0		92.6	25-150				





Sample and Data Qualifiers Relating to This Work Order

PFSu-L The isotopically labeled surrogate recovered below lab control limits due to a matrix effect. Isotope Dilution was applied.

PFSu-H The isotopically labeled surrogate recovered above lab control limits due to a matrix effect. Isotope Dilution was applied.

Definitions and Other Explanations

*	Analyte is not certified or the state of the samples origination does not offer certification for the Analyte.
ND	NOT DETECTED - the analyte is not detected at the Reported to level (LOQ/RL or LOD/MDL)
RL	REPORTING LIMIT - the minimum reportable value based upon the lowest point in the analyte calibration curve.
LOQ	LIMIT OF QUANTITATION - the minimum concentration of a target analyte that can be reported within a specified degree of confidence. This is the lowest point in an analyte calibration curve that has been subjected to all steps of the processing/analysis and verified to meet defined criteria. This is based upon NELAC 2009 Standards and applies to all analyses.
LOD	LIMIT OF DETECTION - a verified estimate of the minimum concentration of a substance in a given matrix that an analytical process can reliably detect. This is based upon NELAC 2009 Standards and applies to all analyses conducted under the auspices of EPA SW-846.
MDL	METHOD DETECTION LIMIT - a statistically derived estimate of the minimum amount of a substance an analytical system can reliably detect with a 99% confidence that the concentration of the substance is greater than zero. This is based upon 40 CFR Part 136 Appendix B and applies only to EPA 600 and 200 series methods.
Reported to	This indicates that the data for a particular analysis is reported to either the LOD/MDL, or the LOQ/RL. In cases where the "Reported to" is located above the LOD/MDL, any value between this and the LOQ represents an estimated value which is "J" flagged accordingly. This applies to volatile and semi-volatile target compounds only.
NR	Not reported
RPD	Relative Percent Difference
Wet	The data has been reported on an as-received (wet weight) basis
Low Bias	Low Bias flag indicates that the recovery of the flagged analyte is below the laboratory or regulatory lower control limit. The data user should take note that this analyte may be biased low but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
High Bias	High Bias flag indicates that the recovery of the flagged analyte is above the laboratory or regulatory upper control limit. The data user should take note that this analyte may be biased high but should evaluate multiple lines of evidence including the LCS and site-specific MS/MSD data to draw bias conclusions. In cases where no site-specific MS/MSD was requested, only the LCS data can be used to evaluate such bias.
Non-Dir.	Non-dir. flag (Non-Directional Bias) indicates that the Relative Percent Difference (RPD) (a measure of precision) among the MS and MSD data is outside the laboratory or regulatory control limit. This alerts the data user where the MS and MSD are from site-specific samples that the RPD is high due to either non-homogeneous distribution of target analyte between the MS/MSD or indicates poor reproducibility for other reasons.

If EPA SW-846 method 8270 is included herein it is noted that the target compound N-nitrosodiphenylamine (NDPA) decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine (DPA). These results could actually represent 100% DPA, 100% NDPA or some combination of the two. For this reason, York reports the combined result for n-nitrosodiphenylamine and diphenylamine for either of these compounds as a combined concentration as Diphenylamine.

If Total PCBs are detected and the target aroclors reported are "Not detected", the Total PCB value is reported due to the presence of either or both Aroclors 1262 and 1268 which are non-target aroclors for some regulatory lists.

2-chloroethylvinyl ether readily breaks down under acidic conditions. Samples that are acid preserved, including standards will exhibit breakdown. The data user should take note.

Certification for pH is no longer offered by NYDOH ELAP.

Semi-Volatile and Volatile analyses are reported down to the LOD/MDL, with values between the LOD/MDL and the LOQ being "J" flagged as estimated results.

For analyses by EPA SW-846-8270D, the Limit of Quantitation (LOQ) reported for benzidine is based upon the lowest standard used for calibration and is not a verified LOQ due to this compound's propensity for oxidative losses during extraction/concentration procedures and non-reproducible chromatographic performance.



Field Chain-of-Custody Record

YORK Project No.
22D1116

York Analytical Laboratories, Inc. (YORK)'s Standard Terms & Conditions are listed on the back side of this document.
This document serves as your written authorization for YORK to proceed with the analyses requested below.
Your signature binds you to YORK's Standard Terms & Conditions.

120 Research Drive Stratford, CT 06615 132-02 89th Ave Queens, NY 11418 clientservices@yorklab.com www.yorklab.com 800-306-YORK 800-306-9675

Page 1 of 1

YOUR Information		Report To:	Invoice To:	YOUR Project Number	Turn-Around Time
Company: <u>WSP</u>	Company: <u>← SAME</u>	Company: <u>← SAME</u>	Company: <u>← SAME</u>	<u>31402220,002</u>	RUSH - Next Day
Address: <u>500 SUMMIT LAKE DR. VALHALLA, NY</u>	Address:	Address:	Address:		RUSH - Two Day
Phone: <u>914 561 2951</u>	Phone:	Phone:	Phone:	<u>WESTCHESTER CO. AIRPORT (WCA)</u>	RUSH - Three Day
Contact: <u>JOHN.BENVEGNA@WSP.COM</u>	Contact:	Contact:	Contact:		RUSH - Four Day
E-mail:	E-mail:	E-mail:	E-mail:	<u>YOUR PO#: 31402220,002</u>	Standard (5-7 Day) <input checked="" type="checkbox"/>

Please print clearly and legibly. All information must be complete. Samples will not be logged in and the turn-around-time clock will not begin until any questions by YORK are resolved.

Michael E. De Felice
M. M. K. De Felice

Samples Collected by: (print AND sign your name)

Matrix Codes	Samples From	Report / EDD Type (circle selections)	YORK Reg. Comp.
S - soil / solid	New York <input checked="" type="checkbox"/>	Summary Report CT RCP Standard Excel EDD	Compared to the following Regulation(s): (please fill in)
GW - groundwater	New Jersey	QA Report CT RCP DQA/DUE <u>EQUIS (Standard)</u>	
DW - drinking water	Connecticut	NY ASP A Package NJDEP Reduced <u>NYSDEC EQUIS</u>	
WW - wastewater	Pennsylvania	<u>NY ASP B Package</u> Deliverables NJDEP SRP HazSite	
O - Oil Other	Other:	NJDKQP Other:	

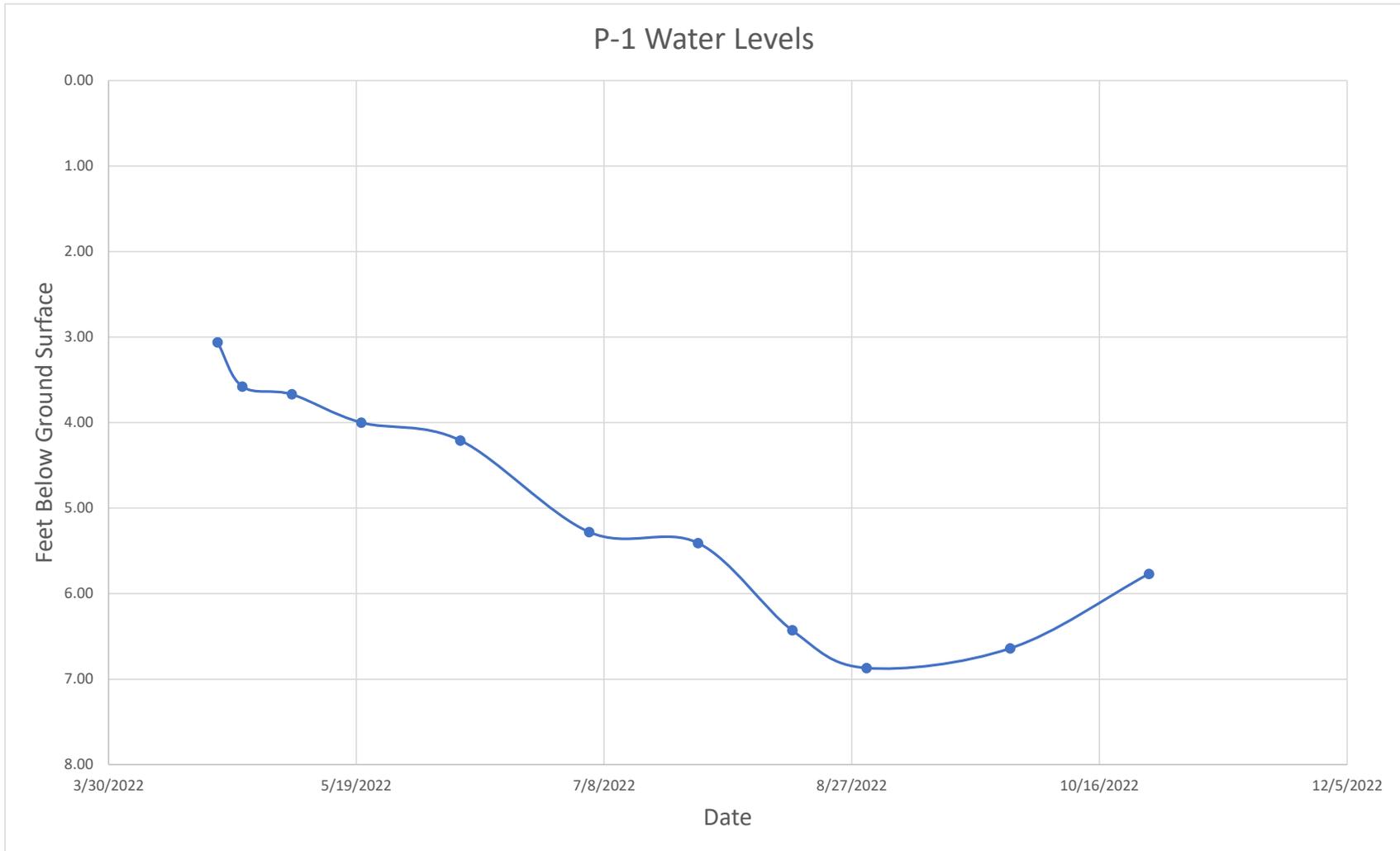
Sample Identification	Sample Matrix	Date/Time Sampled	Analysis Requested	Container Description
<u>P1 GW</u>	<u>GW</u>	<u>4/21/22 0900</u>	<u>TOTAL PFAS</u>	<u>2 UNP. PLAS.</u>
<u>P2 GW</u>	↓	<u>0920</u>	↓	↓
<u>P3 GW</u>	↓	<u>0935</u>	↓	↓
<u>P4 GW</u>	↓	<u>1000</u>	↓	↓
<u>P5 GW</u>	↓	<u>1020</u>	↓	↓

Comments:	Preservation: (check all that apply)	Special Instruction
	HCl ___ MeOH ___ HNO3 ___ H2SO4 ___ NaOH ___ ZnAc ___ Ascorbic Acid ___ Other: ___	Field Filtered Lab to Filter

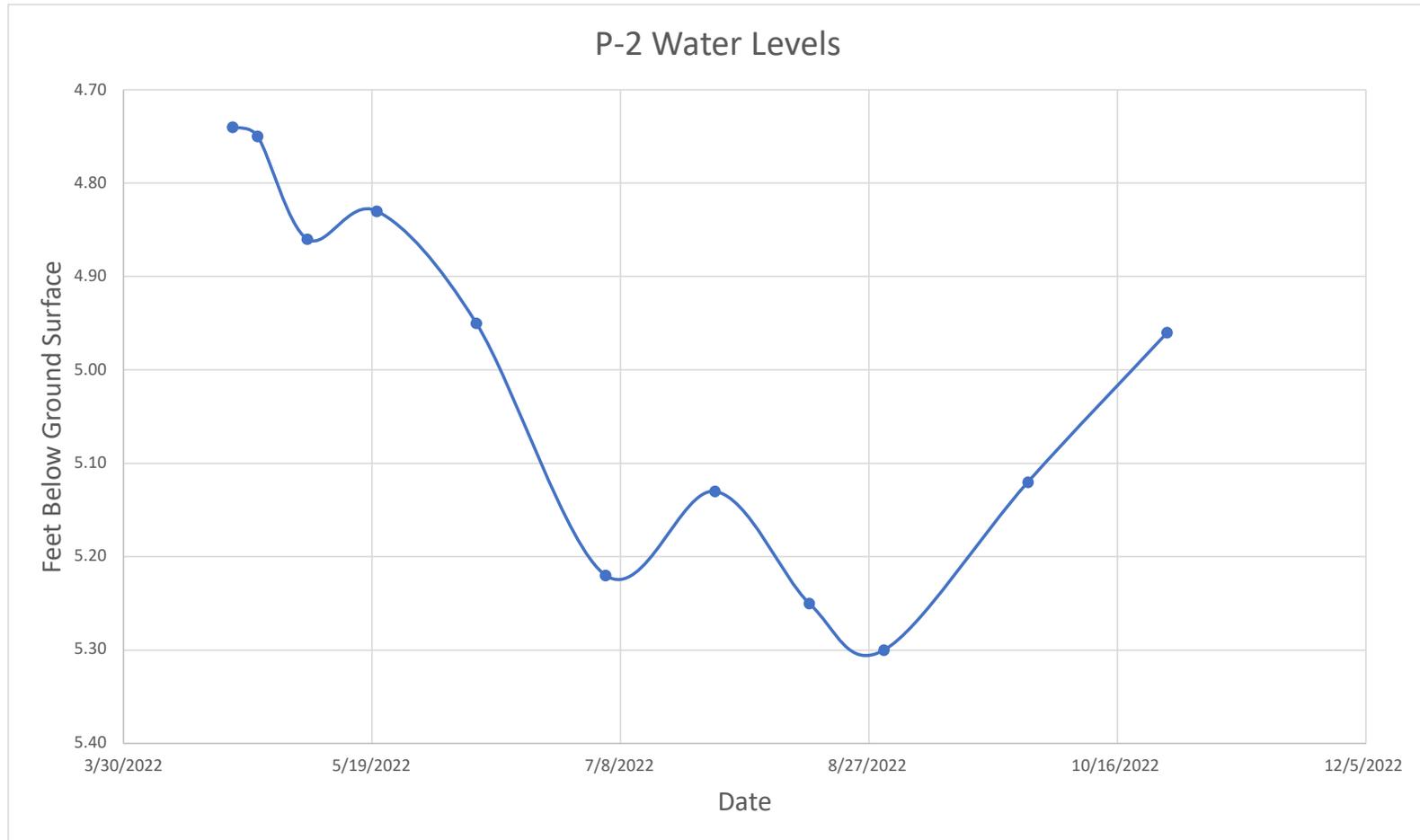
1. Samples Relinquished by / Company <u>Michael E. De Felice WSP</u> Date/Time: <u>4/22/22</u>	2. Samples Received by / Company <u>Chloe York</u> Date/Time: <u>4-22-22 1255</u>	3. Samples Relinquished by / Company	4. Samples Received by / Company
5. Samples Relinquished by / Company	6. Samples Received by / Company	7. Samples Relinquished by / Company	8. Samples Received by / Company
9. Samples Relinquished by / Company		10. Samples Received in LAB by <u>11/11</u> Date/Time: <u>4/22/22 1508</u> Temperature: <u>5.2</u> Degrees C	

APPENDIX C

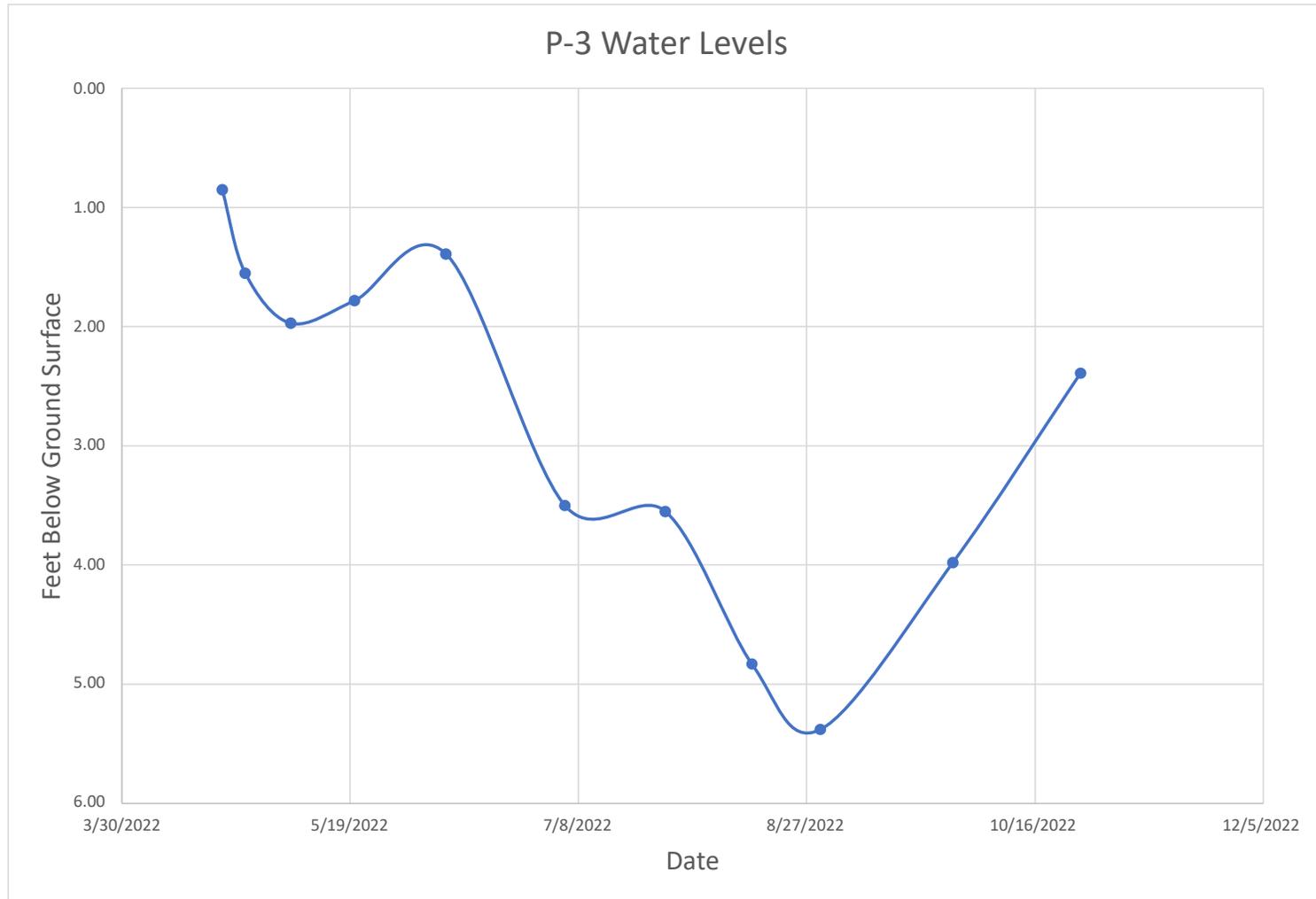
APPENDIX C



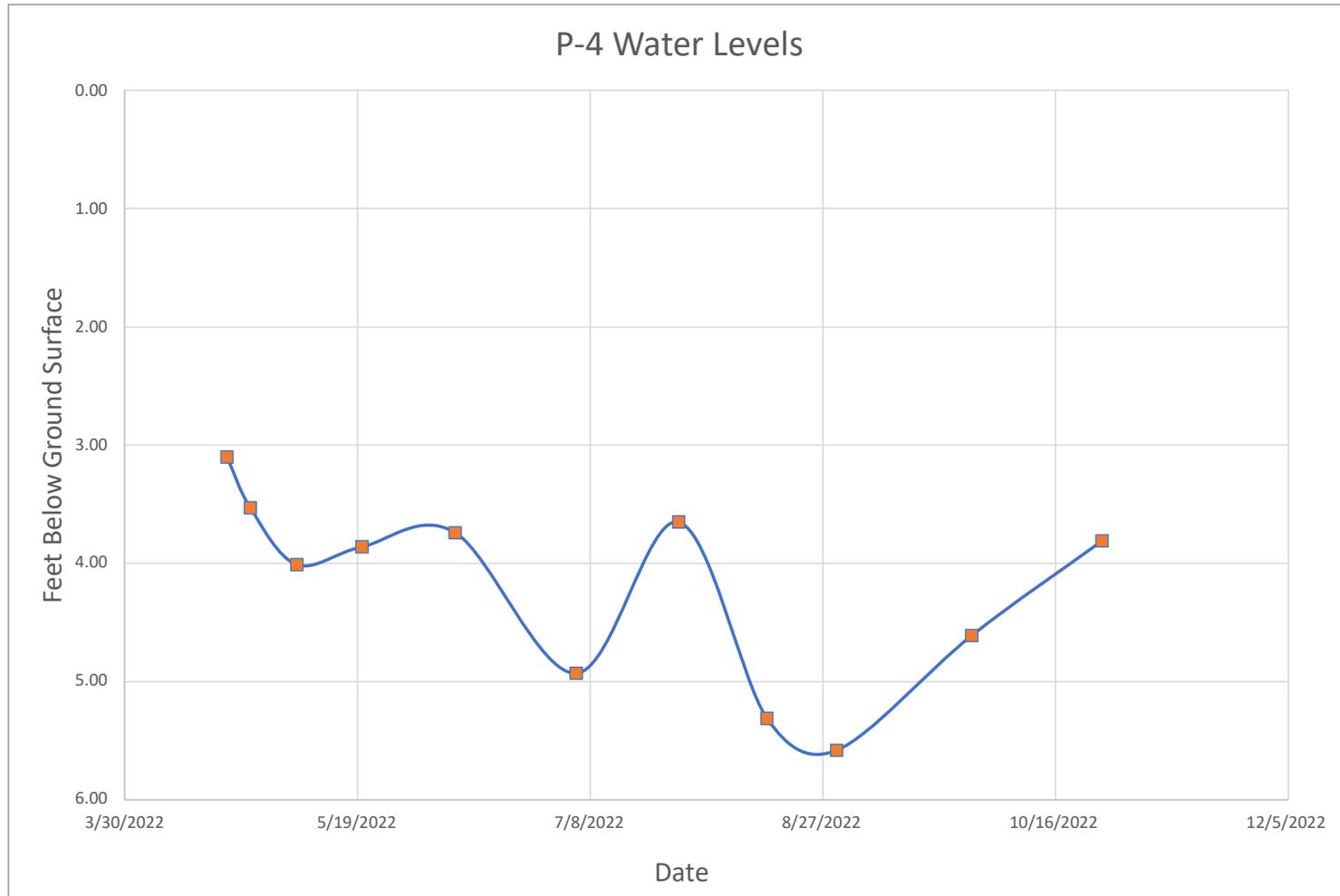
APPENDIX C



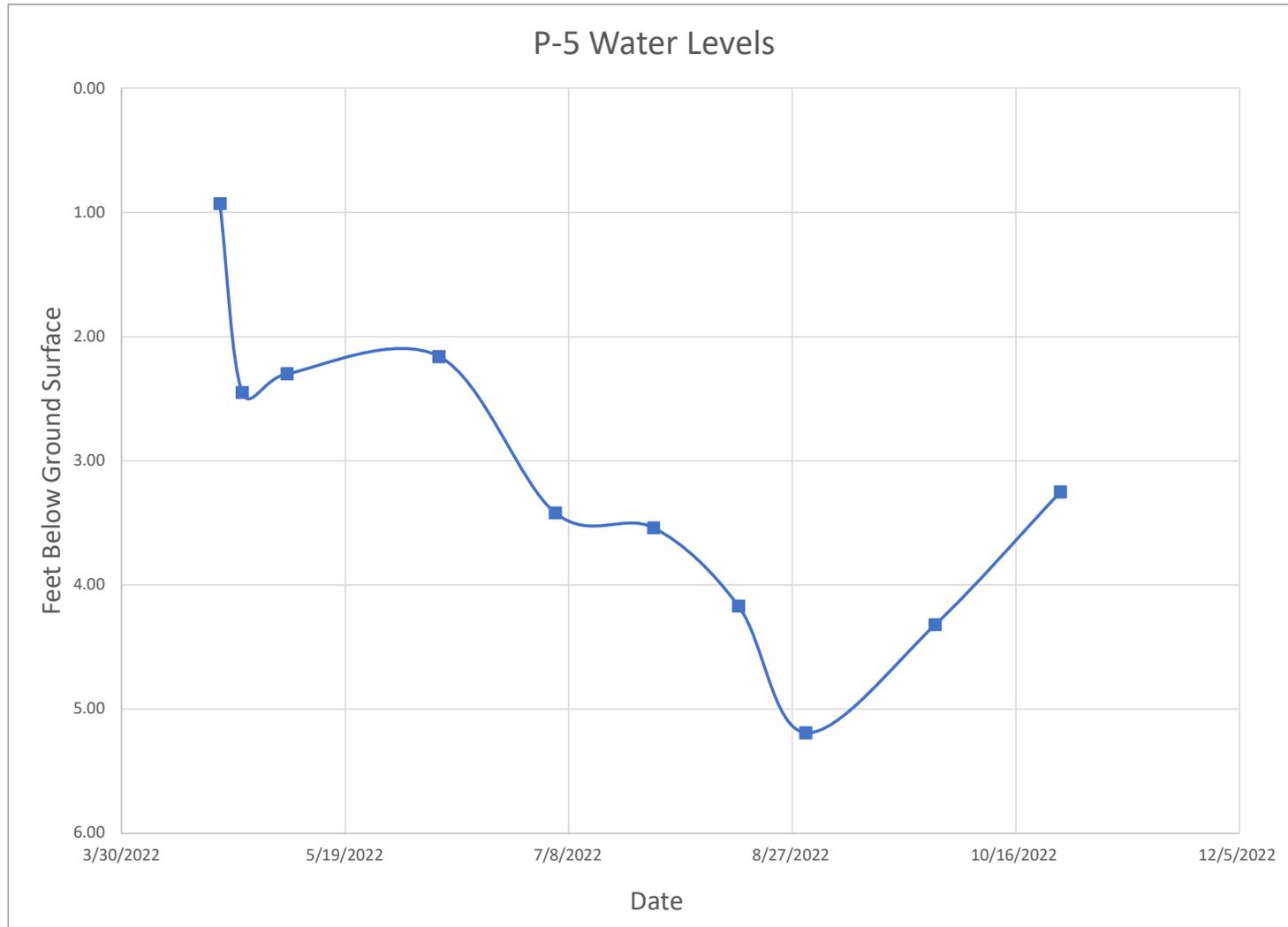
APPENDIX C



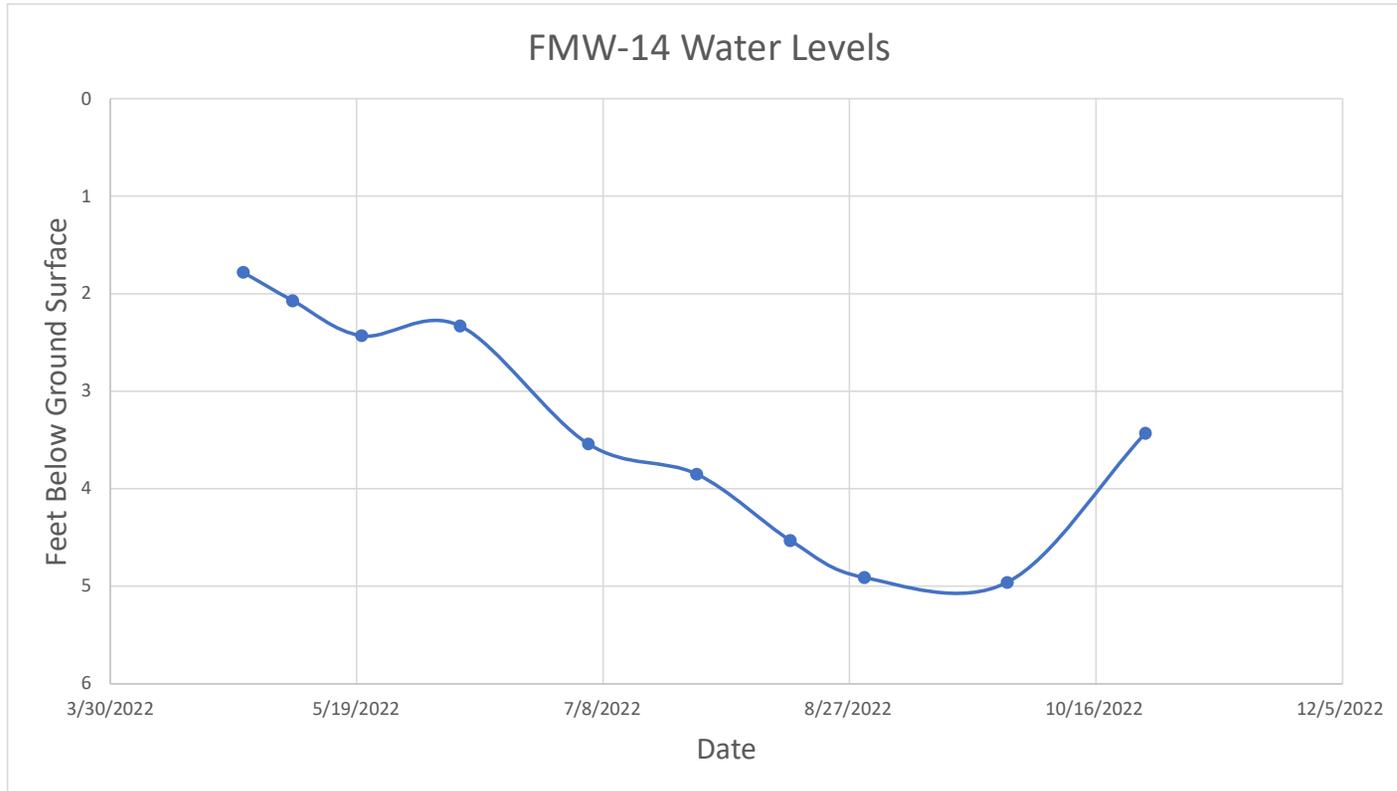
APPENDIX C



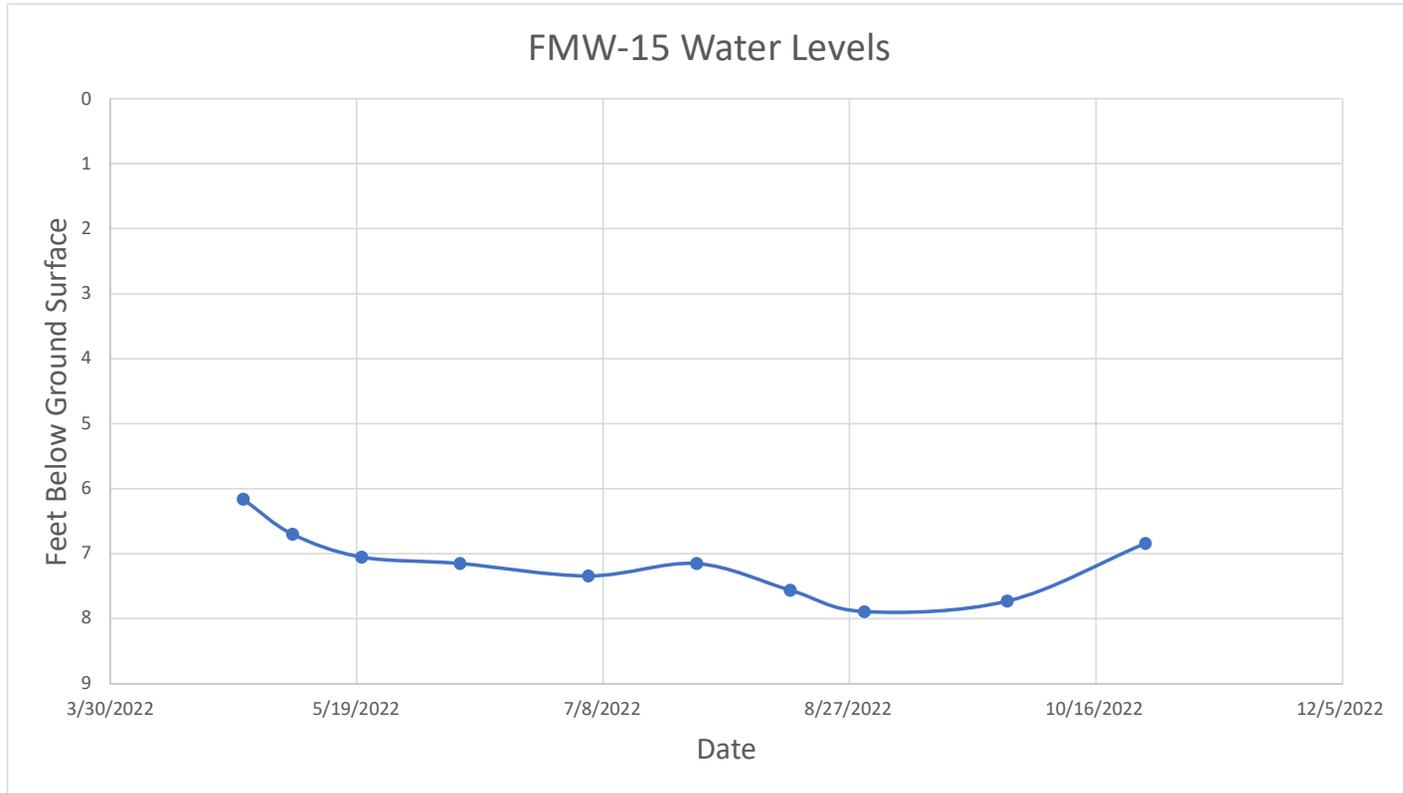
APPENDIX C



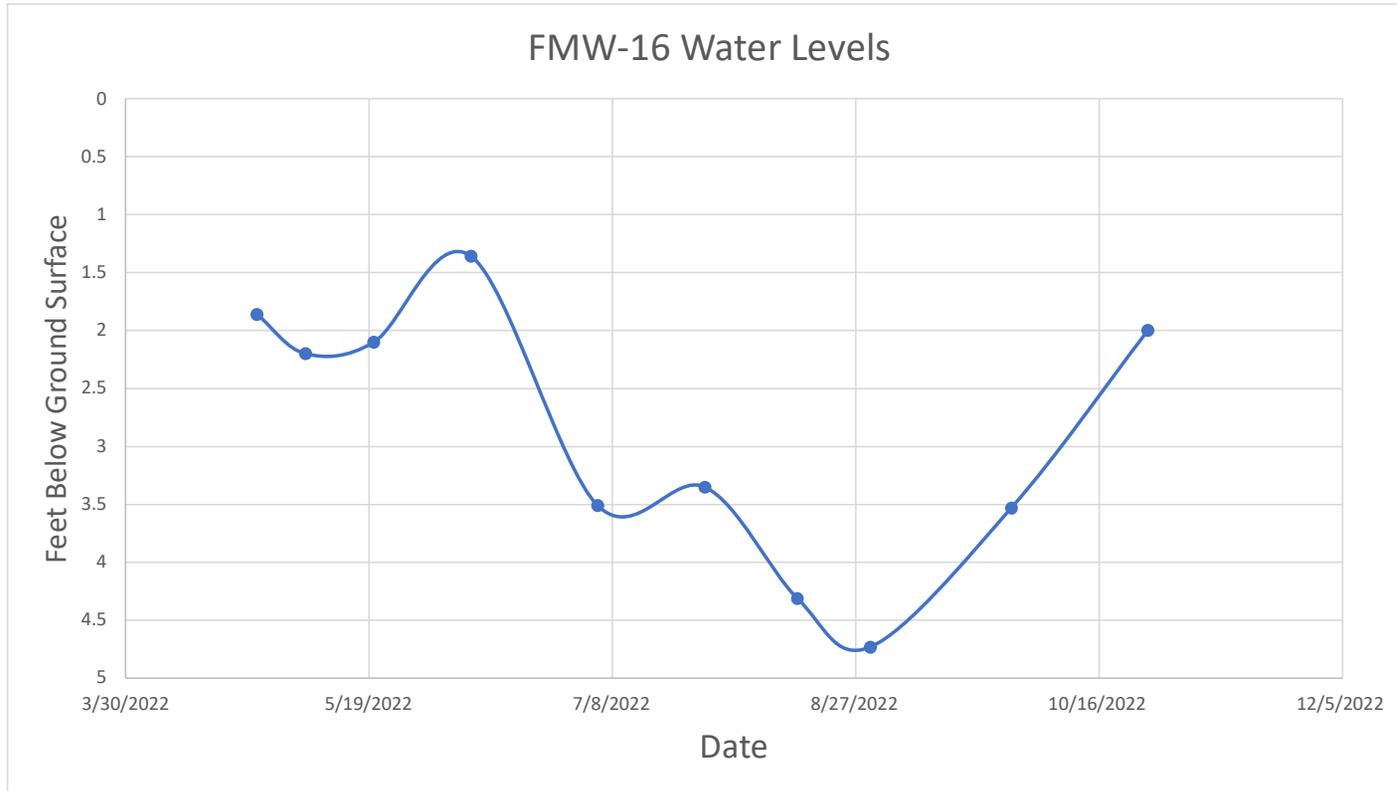
APPENDIX C



APPENDIX C



APPENDIX C





APPENDIX 4

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering

April 29, 2022

Mr. Matthew Hubicki
Project Manager, Remedial Bureau C
Division of Environmental Remediation
New York State Department of Environmental Conservation (NYSDEC)
625 Broadway
Albany, NY 12233-7014

Re: NYSDEC Site No. 360174
Clean Water Pipeline Extension for New King Street
240 Airport Road, White Plains, New York

Dear Mr. Hubicki:

On behalf of Westchester County Department of Public Works and Transportation (WCDPWT), First Environment, Inc. (First Environment) prepared the modified workplan described herein in accordance with the provisions of an Order on Consent (CO3-20180308-44) between Westchester County (the County) and the New York State Department of Environmental Conservation (NYSDEC) executed on June 6, 2019.

This workplan describes the handling of soil and groundwater containing per- and polyfluoroalkyl substance (PFAS), soil sampling, and includes a Health and Safety Plan (HASP), Community Air Monitoring Plan (CAMP), and Quality Assurance Project Plan (QAPP), as well as provisions for environmental oversight and environmental activities conducted in conjunction with the construction and installation of a water supply pipeline from Westchester Joint Water Works (WJWW) to the New King Street residence.

Groundwater in the New King Street area is impacted by PFAS identified by New York State Department of Health (NYSDOH) in May and June 2017. The impacts in this area are believed to have originated from Westchester County Airport (the "Airport"). Specifically, perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) have been identified in groundwater downgradient off the Airport property along New King Street exceeding the New York State's drinking water Maximum Contaminant Level (MCL) of 10 part per trillion (ppt). The New King Street monitoring wells have exhibited the average PFOS+PFOA, PFAS concentrations shown in Table 1 and illustrated in Figure 1. The NYSDOH laboratory analytical package is included in Appendix A.

TABLE 1
 New King Street Well
 PFAS Concentrations

Well Address	Average PFOA/PFOS ng/L	Average PFAS ng/L
1-3 New King Street	81.95	169.05
4 New King Street	4.92	6.04
10 New King Street	28.60	58.57
20 New King Street	22.60	41.65

ng/L = nanograms per liter or parts per trillion (ppt)

As a result of PFOS and PFOA being detected in off-site potable wells located along New King Street, the County of Westchester has agreed to install a water supply waterline extension to the Town of New Castle.

The proposed project consists of the installation of approximately 5,200 linear feet of 12-inch water main from the Westchester County Airport (WCA) to New King Street over a 12- to 16-month period. The nearest municipal water supply available is the WCA internal water main which is fed by WJWW. As a result of impacts to groundwater, Westchester County (County) has agreed to provide the New King Street properties with a connection to a clean municipal water supply source. Once the water line installation is completed, the Town of New Castle will form a new water district and be responsible for maintaining the supply line that serves the local residences in New Castle. The project area both on- and off-site of the WCA where the waterline will extend is illustrated on Figure 1.

Geology/Hydrogeology

First Environment reviewed soil boring and monitoring well logs to evaluate the soil conditions and groundwater elevations where the proposed construction activity is planned (Appendix B). The unconsolidated overburden consists of topsoil, fill, glacial till, and glacial outwash deposits ranging in depth from 5.0 to 45.0 feet below ground surface (bgs). The fill consists primarily of reworked native soils consisting of glacial till and outwash. The glacial deposits consist mainly of yellow-brown micaceous sand and cobbles, although lenses of clay and silt are interbedded and rest atop the weathered bedrock. The Unified Soil Classification System (USCS) classification of the soil in this area was generally sand with varying amounts of silt (SM) to Poorly Graded Sand with low levels of silt (SP). Occasionally, a discontinuous Organic Silt (OL) was encountered. More frequently encountered was inorganic silt (ML) with varying fine sand lenses and rarely, inorganic clay (CL). It is believed that the poorly graded nature of sand with fines coupled with the silt lenses reduces the hydraulic conductivity (K) value of the soil. The K values of soil derived from slug testing at the Airport are generally low range from 0.09 ft/day to a high of 9.33 ft/day in along the perimeter at FMW-13 to FMW-16. The K average value is 2.94 ft/day. It should be noted that these K values were obtained in the immediate vicinity of the construction alignment and were performed by First Environment in August 2000.

Scope-of-Work

The design engineering firms OLA Consulting Engineers (OLA), as well as D&B Engineers and Architects (D&B), have provided a detailed description project in the Clean Water Pipeline Extension for New King Street Engineering Report. The description includes project background, site information, ownership, construction estimate, required permitting, comparison analysis, selected alternatives, engineering report certification, and smart growth for the installation of the water main. The engineering report, along with the engineering drawings prepared by OLA and D&B, is provided in Appendix C. The engineering report, design drawing, bid package, as well as the environmental workplan for the construction and installation of the water supply pipeline is expected for submittal to bidders during the summer of 2022.

The modified workplan describes the environmental activities that are expected to occur during the installation and construction of the water supply waterline.

Health & Safety Plan

Prior to initiating any on-site intrusive activities, First Environment will complete the required public utility mark-out and notifications for the project area, and if necessary private utility mark out. In addition, First Environment will prepare a site-specific HASP in accordance with NYSDEC guidance (DER-10) incorporating the environmental tasks to be completed by First Environment as outlined in this workplan. The HASP is a requirement of the federal Occupational Safety and Health Administration (OSHA) and is not subject to the approval of NYSDEC. A copy of First Environment's Health & Safety Plan is provided in Appendix D.

Air Monitoring

A CAMP has been developed to measure, evaluate, and control, as necessary, potential fugitive particulates and, if observed, volatile organic compounds (VOC) generated during ground intrusive activities. Although, it should be noted that based on Site Characterization performed by First Environment in 2020-2021, it is not expected that VOCs in soil or elevated levels in groundwater will be encountered during construction. The CAMP was developed using the NYSDOH Generic Community Air Monitoring Plan in combination with site-specific information and proposed activities.

Depending on the type of activity, levels of airborne particulates and/or VOCs will be monitored and recorded in real-time at both the upwind and downwind perimeters of the immediate work area. The purpose of the CAMP is to protect the downwind community from a potential release of airborne contaminants to the air generated during the construction activities conducted on the Airport property.

If the recorded levels approach the pre-established action level or if airborne particulates are visually observed migrating off-site or towards sensitive receptors, suppression measures will be implemented immediately. Suppression measures may include misting the particulate source with water, use of particulate suppression

materials, wetting the work area prior to initiating the activities, or stopping work activities until recorded levels fall below the action level.

Although the measures described above will be undertaken, it is First Environment's belief, based on previous investigations, that airborne contaminants at elevated levels are not anticipated resulting from the construction / excavation activities. However, as a best practice to safeguard and protect workers and the community, air monitoring will be performed during all intrusive activities and reported in monthly reports to the NYSDEC. A copy of the CAMP is provided in Appendix E.

Construction Dewatering

First Environment also evaluated surface topography, soil type, groundwater elevation, surface water levels, invert elevation of the waterline and PFAS soil and groundwater concentrations along the proposed water line installation pathway. It was necessary to review this information relative to the proposed depth of the waterline excavation to evaluate if construction dewatering will be necessary and, if so, will the removed water exceed the 10 ppt MCL for PFOS or PFOA concentration. The depth-of-groundwater below ground surface varies along the alignment from 0.5 feet to 20.0 feet below ground surface (bgs). In the proposed construction area, the water table varies across the length of the alignment. In the vicinity of the proposed valve box at the intersection of Airport Road and New King Street, the groundwater is shallow in this area and has been measured six inches below the surface. These areas described from B23+00 to B24+50 and C1+00 to C2+00 are areas where groundwater often has daylighted to the ground surface. These locations are identified on Figure 1 along with the proposed pipeline and shallow groundwater elevation.

Based on the assessment of water levels, surface topography and the invert elevation of the waterline, First Environment has highlighted the areas in yellow on Figures 2 to 5 where it is expected dewatering may be necessary to lower the water table to below the proposed excavation depth to install the proposed waterline. First Environment believes dewatering in those highlighted areas can be accomplished using well points or sumps to lower the water table within the excavation area to install the waterline. First Environment estimates the rate of dewatering may range from 10 to 50 gallons per minute (GPM) along a 100-foot section of waterline installation. At the northern boundary as shown in Figure 1 where the proposed water line installation will occur, PFOS and PFOA concentrations were detected at the following concentrations within the monitoring wells: MW-13R (PFOS + PFOA 1,007 ppt), MW-14 (PFOS+PFOA 114 ppt), MW-15 (PFOS+PFOA 37 ppt), and MW-16 (PFOS+PFOA 307 ppt). A summary of the PFOS and PFOA concentrations was provided on Table 4 of the April 2021 WSP Semi-Annual groundwater monitoring report which has been provided in Appendix F.

The extracted water will be collected and disposed of at an approved facility capable of accepting PFAS impacted water, or the contractor will select a small-scale treatment system capable of treating PFAS impacted water for discharge to the sanitary sewer.

If the latter option is implemented, the Westchester County Department of Environmental Facilities (DEF) will require a remediation permit and potentially other permit requirements be met before treated groundwater can be transferred into the storm sewer system connected to Blind Brook. The DEF requires PFOS and PFOA impacted groundwater be treated before it can be discharged to the storm or sanitary sewer.

Soil Handling – Reuse & Disposal

A total of approximately 3,000 to 3,500 cubic yards of soil will be excavated and stockpiled for waste characterization for either reuse on-site or transportation and disposal to Class D Landfill. The length of waterline where soil will be excavated and stockpiled for waste characterization is highlighted in red on Figures 2 to 6. Soil removed will be stockpiled and secured on and covered with 6-mil plastic sheeting at the Airport next to Building 10# and south of FMW-6. The exact location where soil will be stockpiled will be designated at a later time. The soil, per NYSDEC Guidelines for Sampling and Analysis under NYSDEC's Part 375 Remedial Program published in January 2020 and June 2021, will be evaluated for Precipitation Leaching Procedure (SPLP) to assess the leachability of PFOS and PFOA. The NYSDEC June 2021 guidance states if PFOS and PFOA SPLP results are identified above 10 ppt, the soil has the potential to leach PFOS and PFOA to groundwater above the Drinking Water MCL, such soil will be rejected for reuse. It is implied that if SPLP results for PFOS and PFOA are identified in soil below the PFOS and PFOA 10 ppt MCL, it is generally acceptable to reuse the soil without the likelihood of leachability to groundwater above the 10 ppt drinking water MCL.

If such soil exceeds the PFOA or PFOS leachability of 10 ppt, the soil will be further characterized and transported to a pre-approved facility capable of accepting the waste material. Sampling will also be conducted consistent with procedures described in First Environment's previously submitted QAPP.

Community Engagement

First Environment will continue to support Westchester County with its ongoing community engagement program to assist the County with notifying the public of the environmental actions being taken at the Airport. As requested, First Environment will continue to support County officials and representatives; provide updates, as necessary, to Westchester County Board of Legislators, WCPWT, the Airport, the public, NYSDEC, and local environmental citizens groups regarding environmental activities conducted in response to the waterline supply construction.

Schedule

The anticipated schedule is described below. First Environment will work with OLA Engineers and WCPWT to provide environmental support during the waterline construction activities. First Environment will provide monthly updates informing the NYSDEC and NYSDOH to the progress and any environmental findings

associated with the installation of the waterline. Although, an estimated schedule for the project is shown below, factors outside the control the County for approvals must

Upon NYSDEC approval, First Environment estimates completion of the construction, as described herein, will take 12 to 16 months to complete.

If you have any questions, please do not hesitate to call.

Regards,

FIRST ENVIRONMENT, INC.



Scott R. Green, P.G.
Senior Associate/Director, Insurance
Insurance Consulting Group

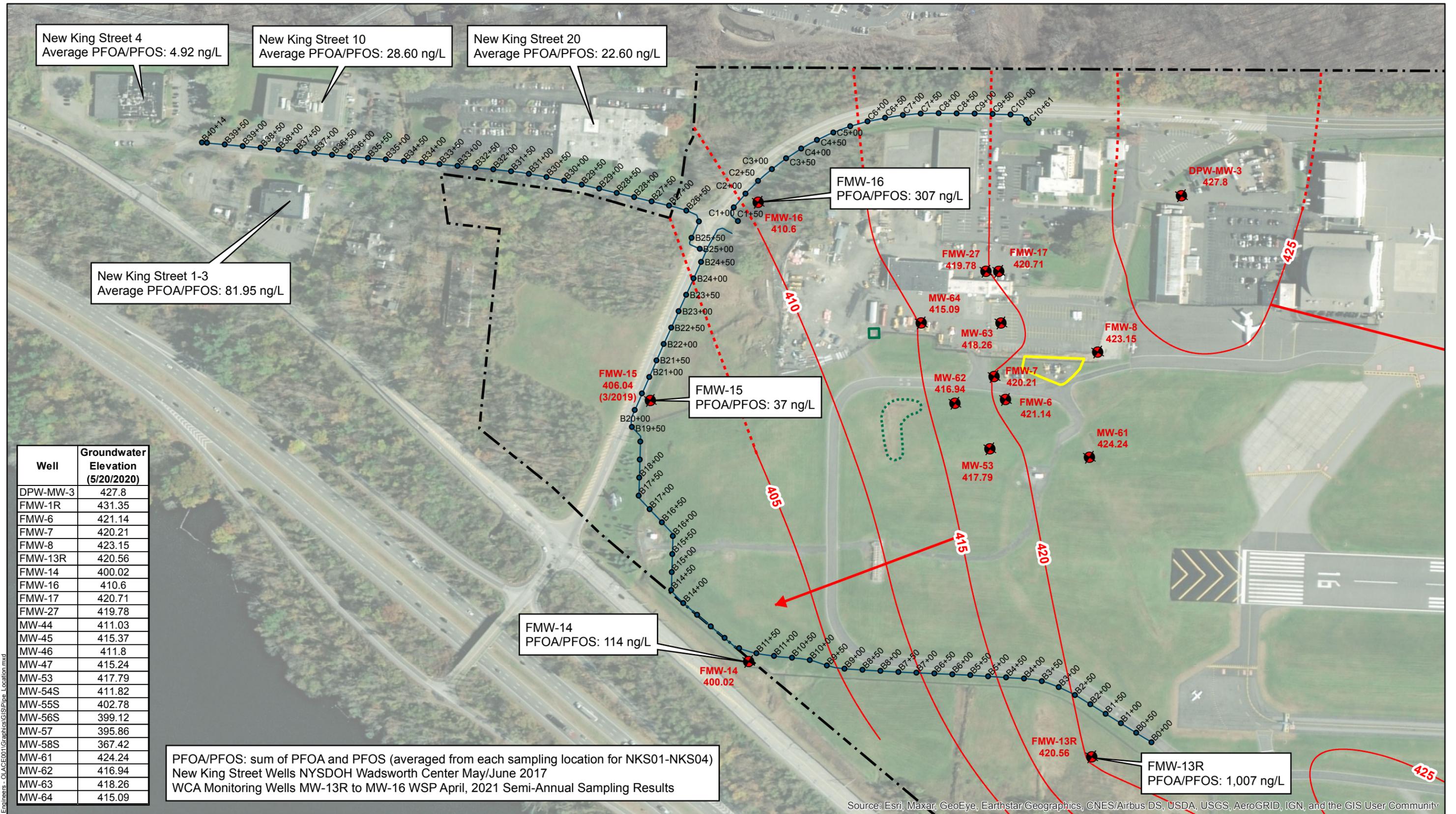


David Luer
Project Manager/Field Team Leader

Att.

- c: B. Tod Delaney, Ph.D., P.E. - First Environment, Inc.
Arthur Clarke, J.D. - First Environment, Inc.
Hugh Greechan, Jr., P.E. - Westchester County (hjg7@westchestergov.com)
John Nonna - Westchester County (jnonna@westchestergov.com)
John Inserra - Westchester County Airport (jhi1@westchestergov.com)
Amy Meyer, Ameyer@westchestergov.com
John Benvegna - WSP (john.benvegna@wsp.com)
G. Heitzman
S. Crisafulli
M. Murphy
J. ~~Bayer~~ ~~Boyer~~
K. Kulow - NYSDOH

FIGURES

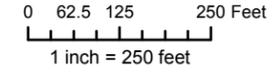


Well	Groundwater Elevation (5/20/2020)
DPW-MW-3	427.8
FMW-1R	431.35
FMW-6	421.14
FMW-7	420.21
FMW-8	423.15
FMW-13R	420.56
FMW-14	400.02
FMW-16	410.6
FMW-17	420.71
FMW-27	419.78
MW-44	411.03
MW-45	415.37
MW-46	411.8
MW-47	415.24
MW-53	417.79
MW-54S	411.82
MW-55S	402.78
MW-56S	399.12
MW-57	395.86
MW-58S	367.42
MW-61	424.24
MW-62	416.94
MW-63	418.26
MW-64	415.09

PFOA/PFOS: sum of PFOA and PFOS (averaged from each sampling location for NKS01-NKS04)
 New King Street Wells NYSDOH Wadsworth Center May/June 2017
 WCA Monitoring Wells MW-13R to MW-16 WSP April, 2021 Semi-Annual Sampling Results

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Legend**
- Unconsolidated Monitoring Well
 - Unconsolidated Groundwater Elevation Contour (feet) as of 5/20/2020
 - Inferred Unconsolidated Groundwater Elevation Contour (feet)
 - Unconsolidated Groundwater Elevation (feet) as of 5/20/2020
 - Unconsolidated Groundwater Flow Direction
 - Water Line
 - Station
 - Property Boundary
 - Former AFFF Burn Pit
 - Subsurface Catch Basin
 - Open Catch Area



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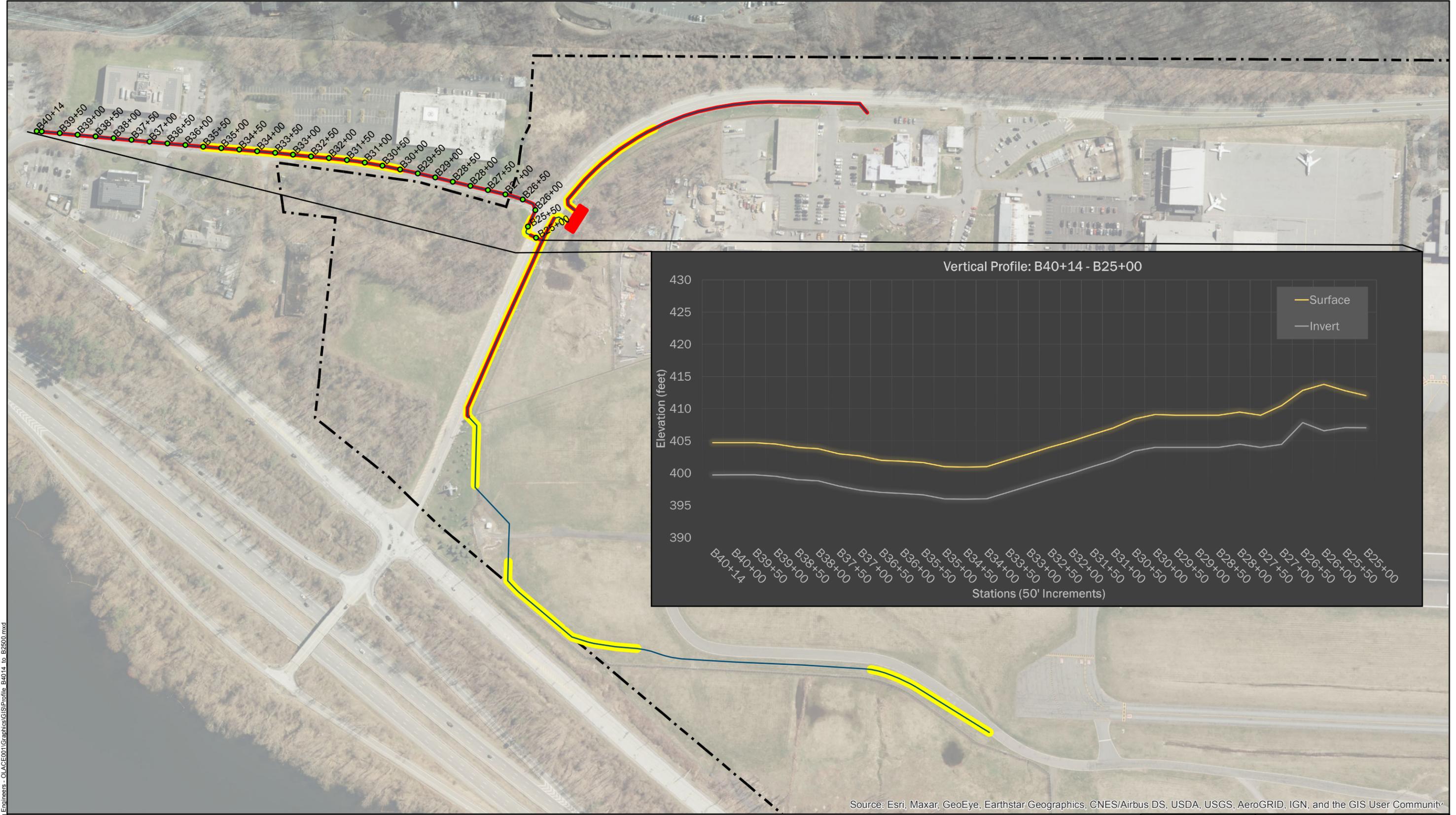
FIRST ENVIRONMENT

NYSDEC SITE NO. 360174
 WESTCHESTER COUNTY AIRPORT
 White Plains, Westchester County, New York
 FIGURE 1
 WATER LINE WITH
 GROUNDWATER ELEVATION

Revised	Drawn	Checked	Approved	Date
	LS	DL	SG	1/19/2022

10 Park Place, Bldg 1A, Suite 504
 Butler, NJ 07405

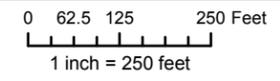
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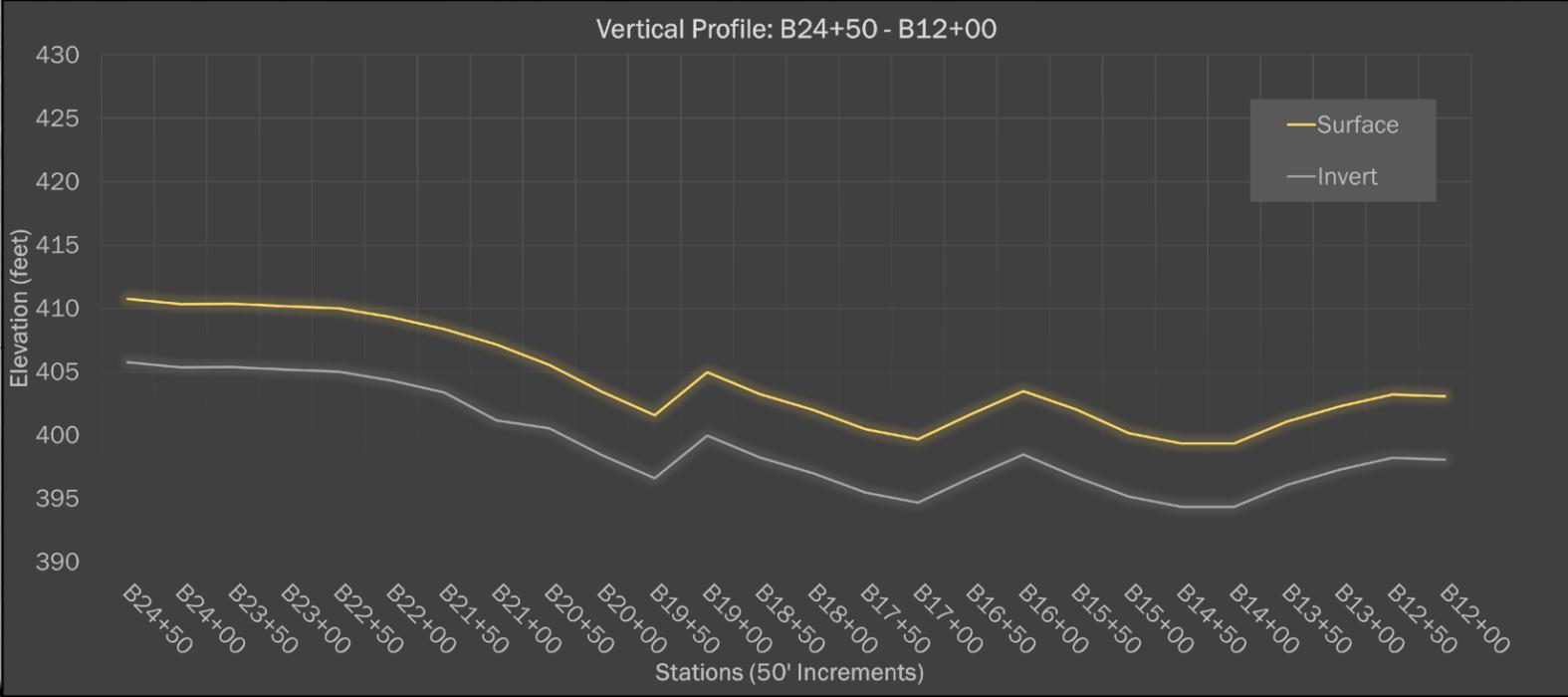
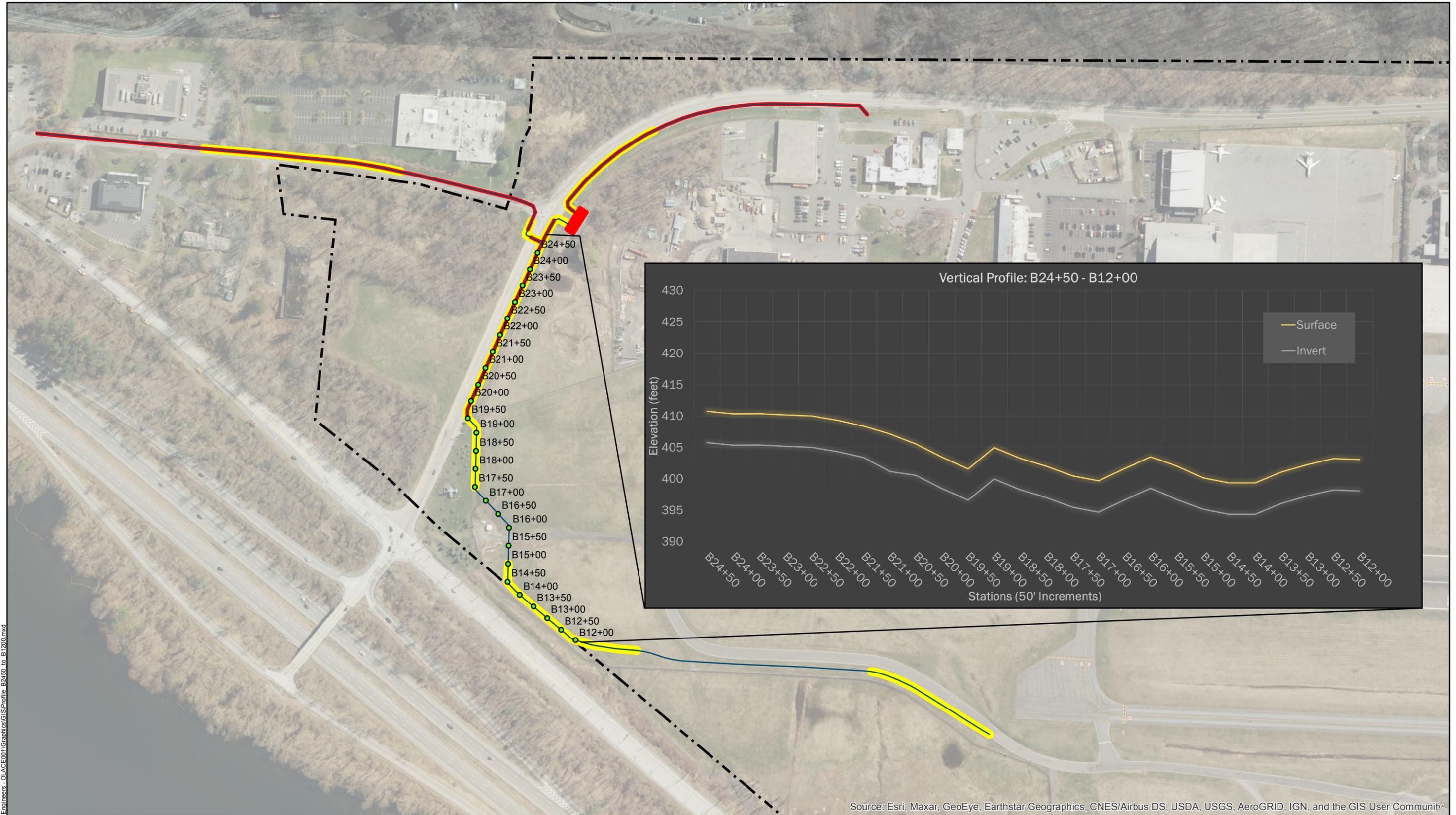
- Legend**
- Stations B40+14 to B25+00
 - Water Line
 - Excavation Requiring Removal
 - Area Requiring Dewatering & Treatment of Water
 - Property Boundary

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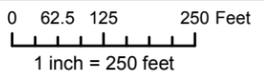
FIRST ENVIRONMENT	NYSDEC SITE NO. 360174 WESTCHESTER COUNTY AIRPORT White Plains, Westchester County, New York			
	FIGURE 2 VERTICAL PROFILE FOR STATIONS B40+14 TO B25+00			
10 Park Place, Bldg 1A, Suite 504 Butler, NJ 07405	Revised	Drawn	Checked	Approved
	LS	DL	SG	Date
				1/13/2022

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Legend**
- Stations B24+50 to B12+00
 - Water Line
 - Excavation Requiring Removal
 - Area Requiring Dewatering & Treatment of Water
 - Property Boundary

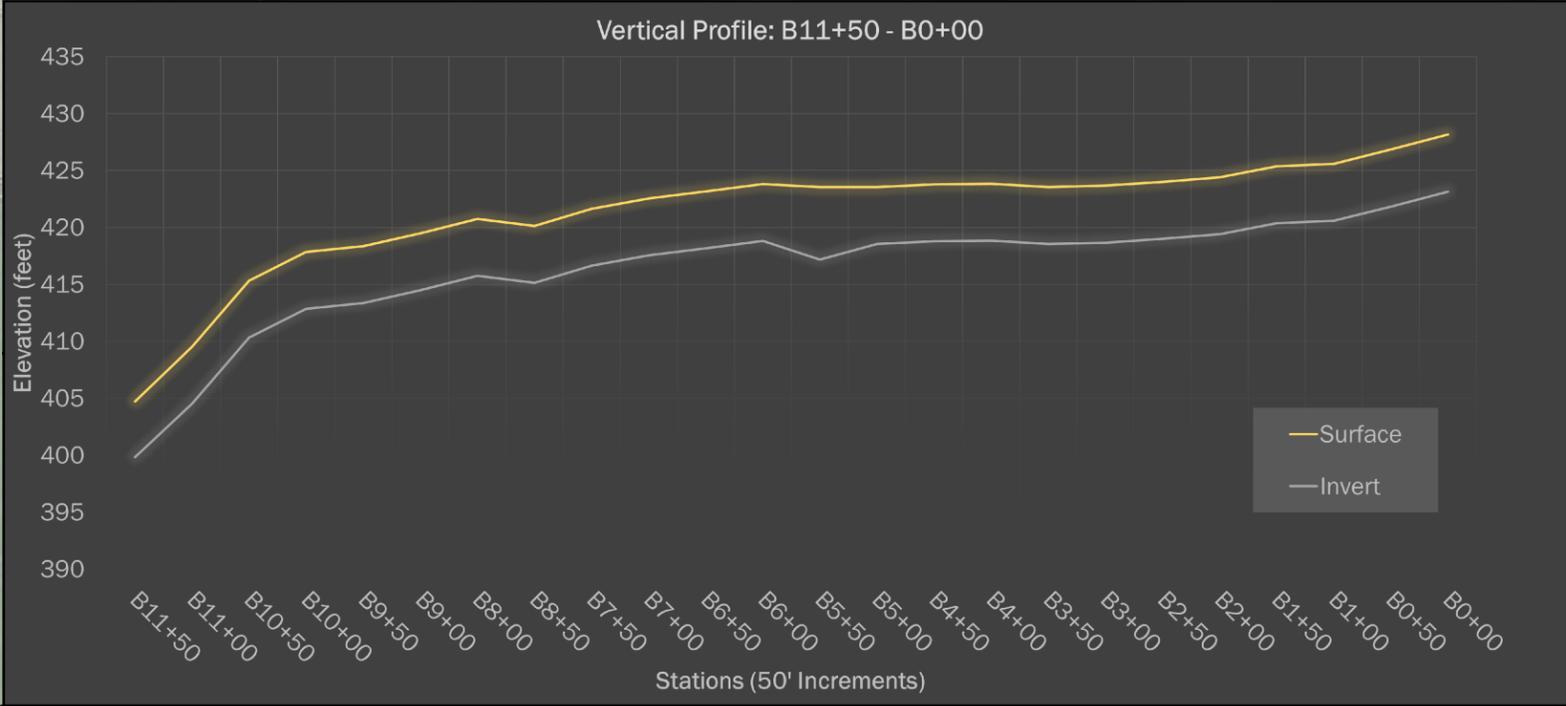
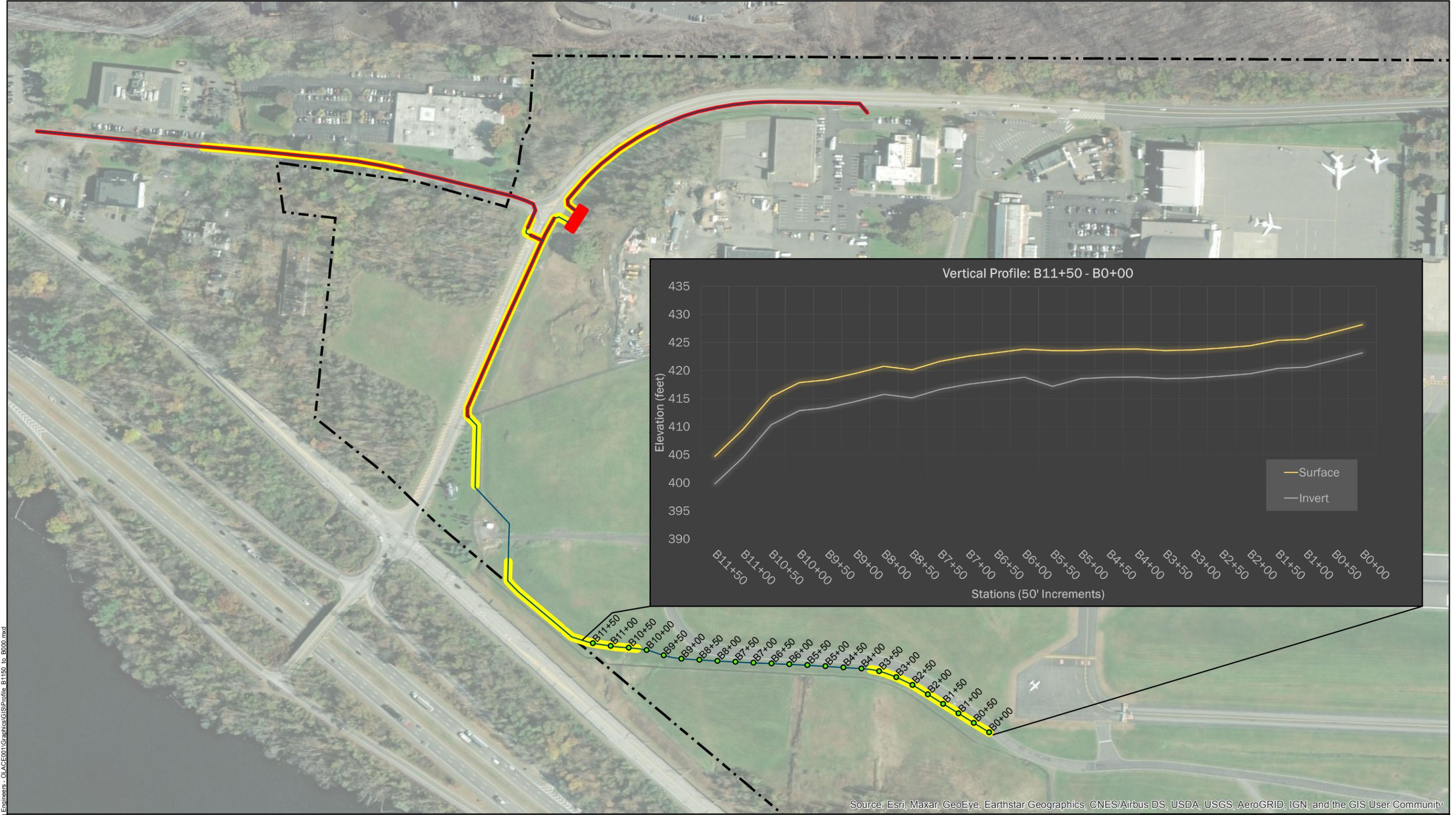


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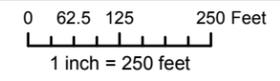
FIRST ENVIRONMENT	NYSDEC SITE NO. 360174 WESTCHESTER COUNTY AIRPORT White Plains, Westchester County, New York				
	FIGURE 3 VERTICAL PROFILE FOR STATIONS B24+50 TO B12+00				
10 Park Place, Bldg 1A, Suite 504 Butler, NJ 07405	Revised	Drawn	Checked	Approved	Date
	LS	DL	SG		1/13/2022

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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

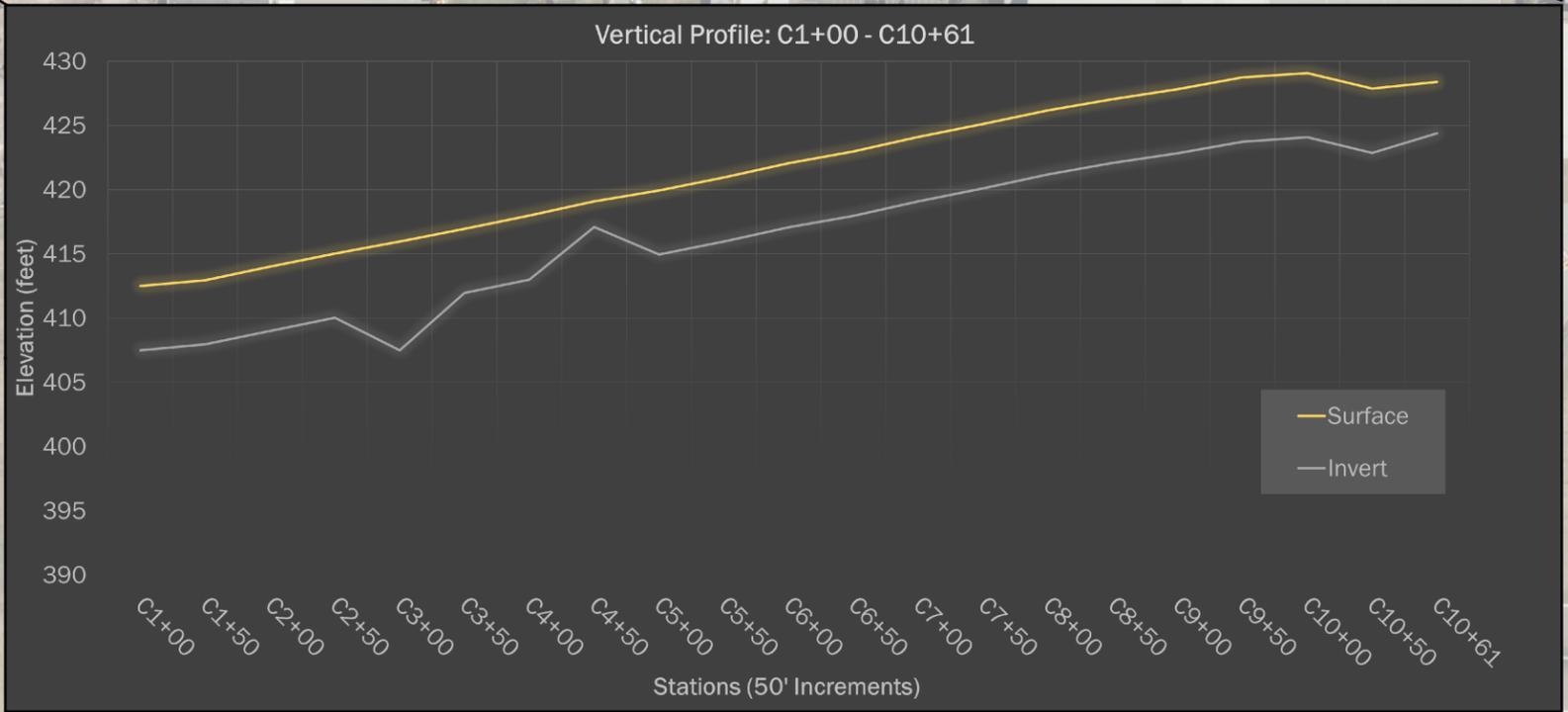
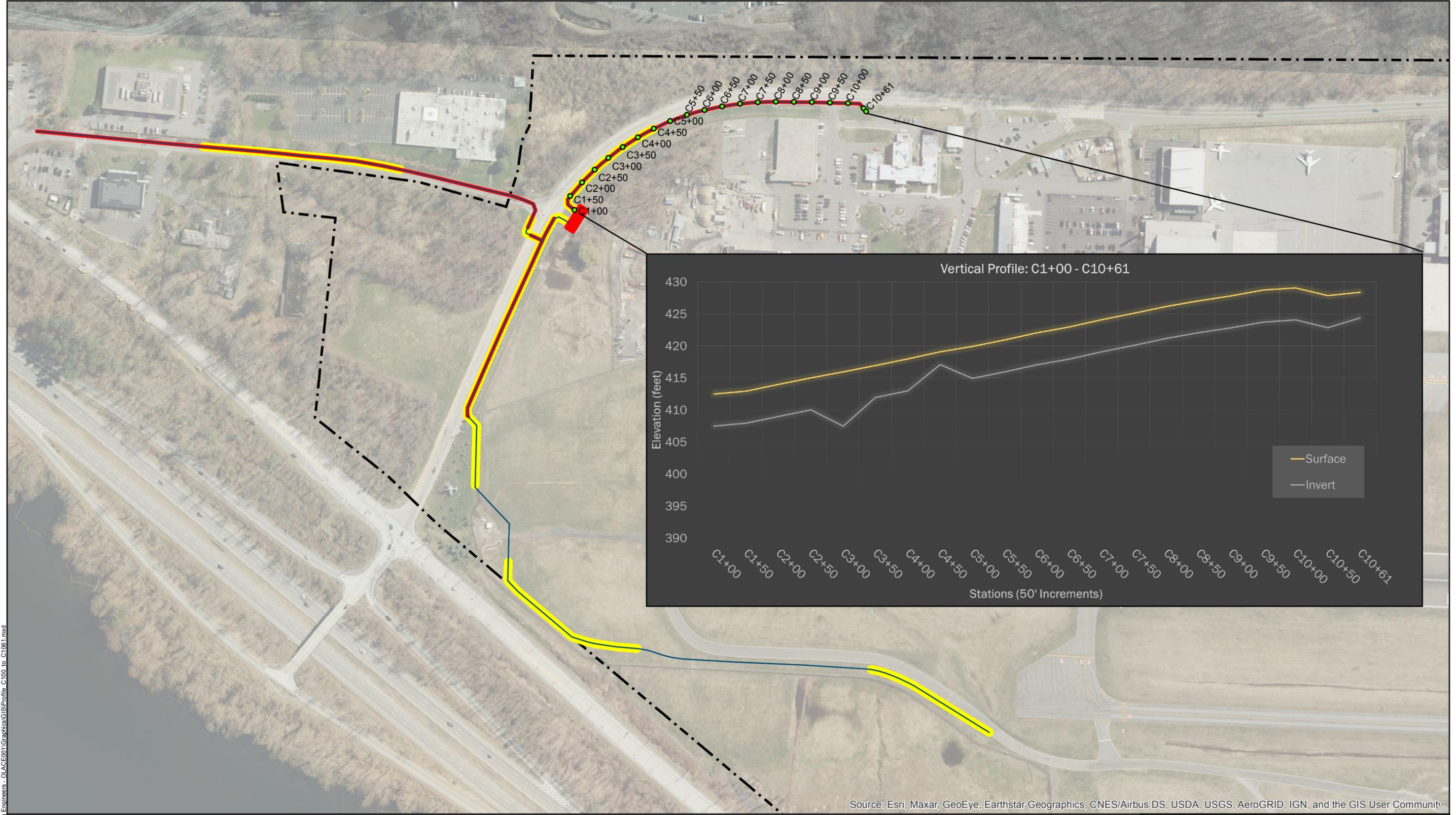
- Legend**
- Stations B0+00 to B11+50
 - Water Line
 - Excavation Requiring Removal
 - Area Requiring Dewatering & Treatment of Water
 - - - Property Boundary



DRAFT
PRIVILEGED & CONFIDENTIAL

	NYSDEC SITE NO. 360174 WESTCHESTER COUNTY AIRPORT White Plains, Westchester County, New York FIGURE 4 VERTICAL PROFILE FOR STATIONS B11+50 TO B0+00			
	10 Park Place, Bldg 1A, Suite 504 Butler, NJ 07405	Revised Drawn LS	Checked DL	Approved SG

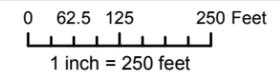
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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

- Legend**
- Stations C1+00 to C10+61
 - Water Line
 - Excavation Requiring Removal
 - Area Requiring Dewatering & Treatment of Water
 - - - Property Boundary



DRAFT
PRIVILEGED & CONFIDENTIAL

	NYSDEC SITE NO. 360174 WESTCHESTER COUNTY AIRPORT White Plains, Westchester County, New York FIGURE 1 VERTICAL PROFILE FOR STATIONS C1+00 TO C10+61			
	10 Park Place, Bldg 1A, Suite 504 Butler, NJ 07405	Revised Drawn LS	Checked DL	Approved SG



APPENDIX 5

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

October 2022

PROJECT:

DOMESTIC WATER LINE IMPROVEMENTS

WESTCHESTER COUNTY AIRPORT

**TOWNS OF HARRISON AND NORTH CASTLE AND VILLAGE OF RYE BROOK,
NEW YORK**

AGREEMENT No.

Prepared for:

WESTCHESTER COUNTY

Prepared by:



**4 W RED OAK LANE SUITE 315
WHITE PLAINS, NEW YORK, 10604**

Table of Contents

1.0	INTRODUCTION.....	4
2.0	SWPPP DEVELOPMENT AND REVIEW	4
3.0	EXISTING SITE CONDITIONS	5
4.0	PROJECT DISCRIPTION	6
5.0	STORMWATER MANAGEMENT.....	7
6.0	SOIL EROSION AND SEDIMENT CONTROL	7
6.1	Potential Sources of Pollution	7
6.2	Pollution Prevention Measures	8
6.3	SWPPP Implementation	10
7.0	CONSTRUCTION SEQUENCE.....	10
8.0	OPERATION AND MAINTENANCE PLAN FOR POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES	12
9.0	CONCLUSION	13
10.0	REFERENCES.....	13

List of Appendices

Appendix A	Figures
	Figure 1 – USGS Site Map
	Figure 2 – Soils Map and Information
	Figure 3 – FEMA Flood Map
Appendix B	Notice of Intent
Appendix C	Owner/Operator Certification Form
Appendix D	SWPPP Preparer Certification Form
Appendix E	Erosion and Sediment Control Plan Review Checklist
Appendix F	Construction Site Inspection and Maintenance Log Book
Appendix G	Contractor/Subcontractor SPDES Permit Certification
Appendix H	Notice of Termination
Appendix I	Erosion and Sediment Control Plans
	C-22 Erosion and Sediment Control Plan No. 1
	C-23 Erosion and Sediment Control Plan No. 2
	C-24 Erosion and Sediment Control Plan No. 3
	C-25 Erosion and Sediment Control Plan No. 4
	C-26 Erosion and Sediment Control Plan No. 5
	C-27 Erosion and Sediment Control Plan No. 6
	C-28 Erosion and Sediment Control Details

1.0 INTRODUCTION

This Stormwater Pollution Prevention Plan (SWPPP) has been prepared in accordance with the requirement and the specifications presented in the New York State Department of Environmental Conservation (NYSDEC) SPEDES General Permit GP-0-20-001 for Stormwater Discharges for Construction Activities.

The SWPPP describes the practices and procedures necessary to minimize pollutants in stormwater discharge. The SWPPP was designed in conformance with the criteria established in the New York State Stormwater Management Design Manual and the New York State Standards and Specifications for Erosion and Sediment Control.

Site Owner/Operator

The owner/operator for the construction activities is responsible to oversee the installation and maintenance of all stormwater pollution prevention measures proposed in this report. (Appendix C)

Westchester County Dept. of Public Works and Transportation
148 Martine Ave #500
White Plains, New York, 10601
(914) 995-2547

2.0 SWPPP DEVELOPMENT AND REVIEW

SWPPP Development

The SWPPP was developed by D&B Engineers and Architects (Appendix D) in accordance with accepted engineering practices to provide the following information:

- Potential sources of stormwater pollution from the construction site;
- Protective measures to minimize the transport of sediment and pollutants during construction;

- Outline the owner and contractor responsibility to maintain the post stormwater managements in compliance with the SPEDES Permit GP-0-20-001;
- Outlines the owner and contractor responsibility to maintain the post stormwater management practices in compliance with SPEDES Permit No. GP-0-20-001.

Soil erosion and sediment control drawings were prepared by D&B Engineers & Architects in accordance with the New York State Standards and Specifications for Erosion and Sediment Control Manual (Appendix E for checklist and Appendix I for drawings).

SWPPP Review and Update

This SWPPP shall be kept on-site during construction and will be made available for review by the designer, contractor, sub-contractor, and applicable regulatory agencies that have jurisdiction over the construction site. If necessary, these regulatory agencies may notify the owner that the SWPPP is not in compliance with the required regulations. If the SWPPP is in need of revision, the owner or operator shall make the required revisions to the SWPPP, within 14 calendar days of notification by the regulatory agency. The owner shall also submit a written certification that the revisions have been made and will be implemented. If the owner or operator does not respond to the notice, owner or operator coverage under SPEDES Permit No. GP-0-20-001 may be suspended.

3.0 EXISTING SITE CONDITIONS

The project is located in the Village of Harrison, Town of Harrison and North Castle, Westchester County, New York, east of the interstate 684.

The project site is identified as:

Section 119.03, Block 1, Tax Lot 6

Section 97, Block 971, Tax Lot 8

The site location is depicted on the USGS Topographic New York Quadrangle (Appendix A Figure 1). The terrain at the project sites is level to gently sloped, with no significant changes in grade. Information about the soil in the project area can be found on Appendix A for Westchester County Airport and New King Street, as well as Tower Road.

Existing flood information for the project site was reviewed. Based on the FEMA FIRMette Flood Maps, the project area is not in an area of potential flood hazard. Refer to Appendix A Figure 3.

4.0 PROJECT DISCRPTION

The project includes the construction of $\pm 5,200$ LF of new DIP 12" water mains, meter vault, and two (2) new backflow preventer (BFP) buildings along Tower Road, Westchester County Airport, Airport Road and New King Street.

The work on Tower Rd, east of Route 120, will consist of one new BFP building. The existing building will be demolished and a new BFP building will be placed in a new location on site. 46 LF of watermain will be installed following the demolition of the existing BFP building.

The new water main will begin at the Westchester County Airport on Airport Perimeter Road. The main will continue along Airport Road where it meets the new BFP building and will continue along Airport Road. Prior to the BFP building the new water main tees and meets the PRV building and continue to New King Street. The main will be used to serve the buildings on New King Street in the future.

5.0 STORMWATER MANAGEMENT

The proposed development will disturb approximately .5 acres, based on water main installation, addition of one (1) PRV and two (2) BFP buildings. Since the ground disturbance area is less than 1-acre, the project is not required to meet the water quantity and water quality requirements of New York State Stormwater Management Design Manual but is required to file a Notice of Intent (NOI) with the NYSDEC, since it is located in the NYC watershed.

Contractor must provide erosion control Best Management Practices (BMPs) during construction to minimize sediment from entering surrounding water bodies. (Appendix B).

6.0 SOIL EROSION AND SEDIMENT CONTROL

During construction, both temporary and permanent soil erosions measures shall be enforced, to minimize impact to the surrounding areas.

Soil erosion will be controlled by:

- Keeping stockpiles less than 15 feet high and keeping the sides of the slopes of the stockpiles at or less than 2:1; and
- Construction a 50 ft long x 20' wide crushed stone stabilized construction entrance as the points of ingress and egress for construction vehicles.

6.1 Potential Sources of Pollution

Construction activities that have the potential to contribute sediment to storm water discharges include:

- Grading and site excavation operations
- Soil import/export operations
- Vehicle tracking
- Topsoil stripping and stockpiling

The following is a list of construction materials that will be used and activities that will be performed that will have the potential to contribute to pollutants, other than sediment, or storm runoff:

- Vehicle fluids including oil, grease, petroleum, and coolants
- Cement material associated with concrete operations
- Mortar mix
- Raw landscaping materials and wastes (topsoil, plant materials, herbicides, fertilizers, mulch, pesticides)
- Sanitary facilities
- General litter and debris
- Other hazardous material

6.2 Pollution Prevention Measures

The construction will require the excavation and regrading of soils on site. The total area of disturbance is approximately .5 acres. During construction, temporary and permanent soil erosion and sediment control measures shall be implemented, to minimize impacts to the surrounding areas and waterbodies, following these guidelines:

- Minimizing disturbed areas and providing temporary seeding and mulching as required if construction operations cease for more than 7 days within any previous area.
- Constructing a stabilized construction access at the points of egress and ingress for construction vehicles. Stabilized construction entrances will be at least 50-feet long and a minimum of 16-feet wide and will consist of a layer 3-inch clean stone or recycled concrete equivalent at least 12-inches thick. The stabilized construction site entrances

will be installed before construction begins on site. The entrances will remain until all areas of the site have been stabilized.

- All construction and demolition debris shall be placed in appropriate containers and removed from site.
- Maintain temporary fence enclosures of construction activity on property for safety purposes.
- Installation of temporary stormwater inlet protection structures on all existing drainage structures adjacent to the site and all newly developed drainage structures as constructed.
- Placing inlet filters over the grate of each existing drainage structure adjacent to the project and over each stormwater inlet or catch basin as it is constructed to prevent sedimentation within the storm sewer system.
- Cleaning inlet filters and the upstream sides of all silt fencing after each erosion producing storm.
- Erosion control measures (i.e., silt fence) will be implemented and maintained on a regular basis during construction until permanent restoration is completed. Installing silt fence barriers along the perimeter of site, along the base of slopes and around the perimeter of topsoil stockpiles. The repair and/or replacement of perimeter controls and covers will be conducted as needed to keep them in functioning condition.
- Water spraying to minimize dust generated by the transferring of material, stockpiles, and truck movement on paved and unpaved surface areas. Dirt haul roads will be sprinkled with water or given a surface of crushed stone or woodchips as required. Vehicles will be cleaned, as necessary, prior to using public streets. Paved roads will be sprinkled with water.

- Stockpile stabilization and slope stabilization. Keeping topsoil stockpiles less than 15 feet high and keeping side slopes at or less than 2:1. Stockpiles are to be protected during the entire construction site period. Stockpiles will be located in designated areas away from concentrated flows of storm water, drainage courses and inlets.
- Any chemicals will be securely stored in approved containers in order to prevent any accidental release.

6.3 SWPPP Implementation

The Contractor shall be responsible for installing, constructing, repairing, inspecting, and maintaining the erosion and sediment control practices including SWPPP. (Appendix G).

The operator shall agree to have a qualified professional conduct an assessment of the site prior to construction commencing and certify that the appropriate erosion and sediment control practices have been adequately placed. When construction commences, construction inspections shall be conducted by the qualified professional at least every 7 days. (Appendix F). The operator shall maintain a record of all weekly inspections in a site log book, to be kept on siter and made available upon request of permitting authorities.

7.0 CONSTRUCTION SEQUENCE

Construction will be completed in a single-phase. Single-phase construction allows for an entire project to be completed in a continuous schedule with no lapses or breaks. Construction will follow normally expected construction standards.

The contractor will be responsible for installing and maintaining the required relevant sediment and erosion control measures in accordance with the details provided on the Erosion and Sediment Control Plan or as may be required by actual field conditions during construction and/or as directed by the engineer. All erosion and sediment control measures will be installed in accordance with the Erosion and Sediment Control Plan and/or pursuant to the prevailing “New York Guidelines for Urban Erosion and Sediment Control” manual.

Specific control measures include not permitting site construction activity (earthwork) during heavy rain, frozen conditions, or wet conditions.

The following sequence of activities comprises the construction work to be conducted at the site:

1. All erosion and sediment control measures will be implemented as required prior to any ground disturbance to prevent the transport of sediment to offsite areas (i.e., adjacent properties or roadway).
 - a. Installation of sediment barriers (silt fence) along the limits of disturbance for the duration of the work and in addition to temporary construction entrance.
 - b. Drainage inlets will be protected from sediment buildup through the use of sediment barriers and sediment traps as required.
2. Clearing and grubbing of vegetation.
3. Demolition of existing structures.
4. Provide silt fence along the bottom of all slopes for stabilization.
5. Stabilize all stockpiled materials by seeding and/or construction straw bale dikes around the base of the stockpiled material.

6. After construction is completed, all remaining disturbed areas shall be permanently stabilized.
7. At the conclusion of construction phase, clean out all drainage systems of any accumulated sediment of construction debris.

Ongoing Construction Activities:

1. Proper maintenance of erosion control measures will be ensured by daily follow-up inspections after heavy or prolonged storms.
2. Maintenance measures to be installed include, but are not limited to, cleaning of sediment basins or traps; cleaning or repair of sediment barriers; repair/replacement of damaged silt fencing, replacement of damaged haybales, and cleaning and repair of inlet protection.
3. Supplemental hay bales and silt fencing will be required to be stored on-site in case initial hay-bales and silt fencing become damaged or are not working properly.
4. Immediately clean all materials that are spilled, dropped, washed, or tracked onto any paved surfaces (roadways, parking lot, sidewalks, walkways, etc.) resulting from the contractor's work.

8.0 OPERATION AND MAINTENANCE PLAN FOR POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

Post-construction stormwater management practices (SMPs) are permanent measures installed during construction that are designed to reduce or eliminate pollutant discharges from the site after construction is completed.

Prior to filing the Notice of Intent (Appendix H) or the end of the permit term, the qualified inspector shall perform a final site inspection to certify that the site has undergone final stabilization. The Owner will then be required to submit a written Operation and

Maintenance Assessment annually, prepared by a New York State Licensed Professional Engineer stating that the final stabilizing structure(s) continuously functions as designed.

Routine maintenance is required for the following components of the stormwater management system.

- Catchbasins
- Manholes
- Trench Drains
- Culverts

The above components should be inspected after each major storm event (greater than 2-year, 24-hour rainfall) and no longer than every three months (seasonally).

9.0 CONCLUSION

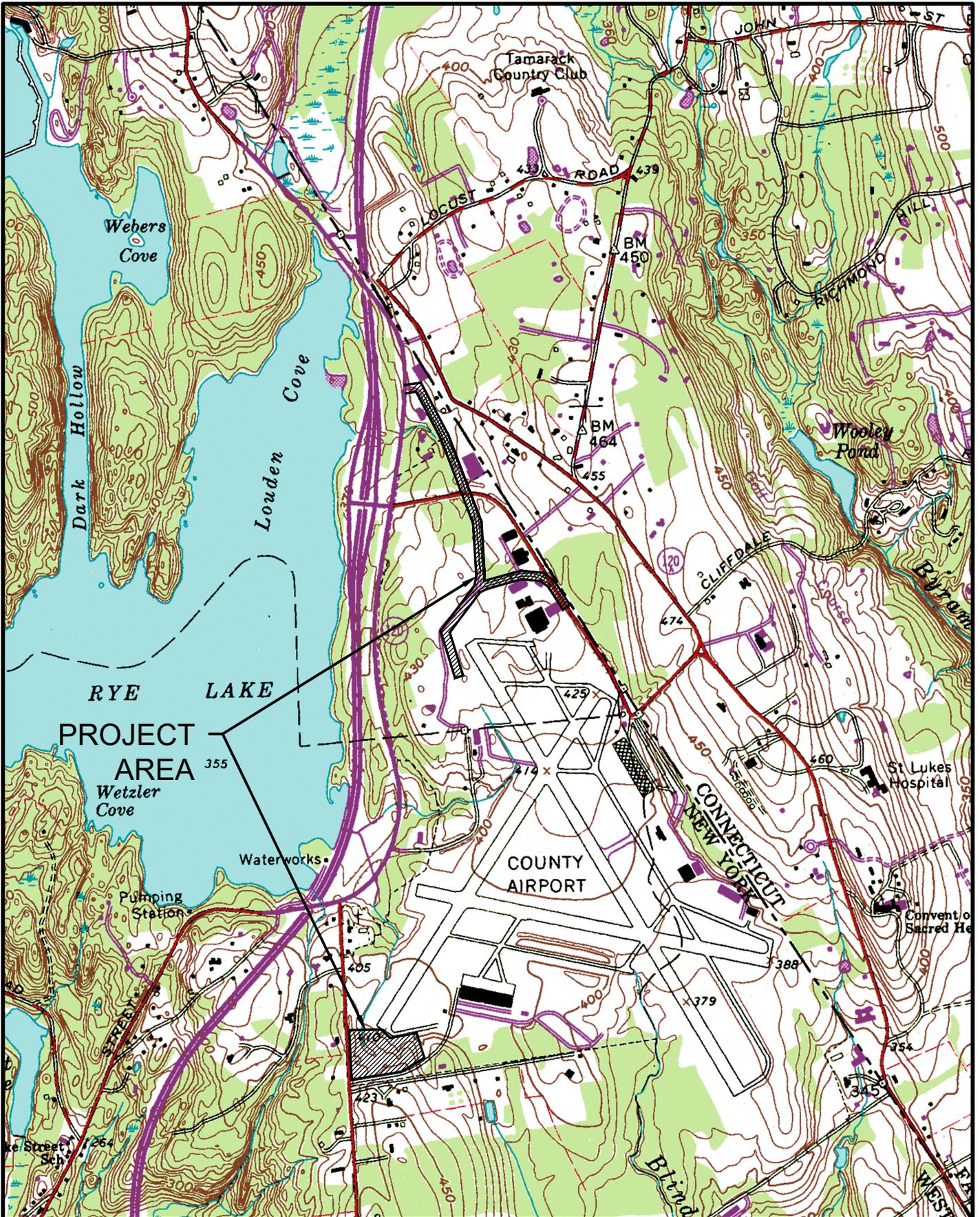
The project improvements indicated on the design drawings and shown in this report, demonstrate that the stormwater management practices selected are in conformance with the requirements of the New York State Stormwater Design Manual and the New York State Department of Environmental Conservation (NYSDEC) General Permit (GP-0-20-001).

10.0 REFERENCES

1. New York State Stormwater Management Design Manual
2. FEMA FIRMette Maps

Appendix A
Figures

Figure 1
USGS Site Map



DOMESTIC WATER LINE IMPROVEMENTS
 WESTCHESTER COUNTY AIRPORT
 TOWNS OF HARRISON AND NORTH CASTLE AND
 VILLAGE OF RYE BROOK, NEW YORK

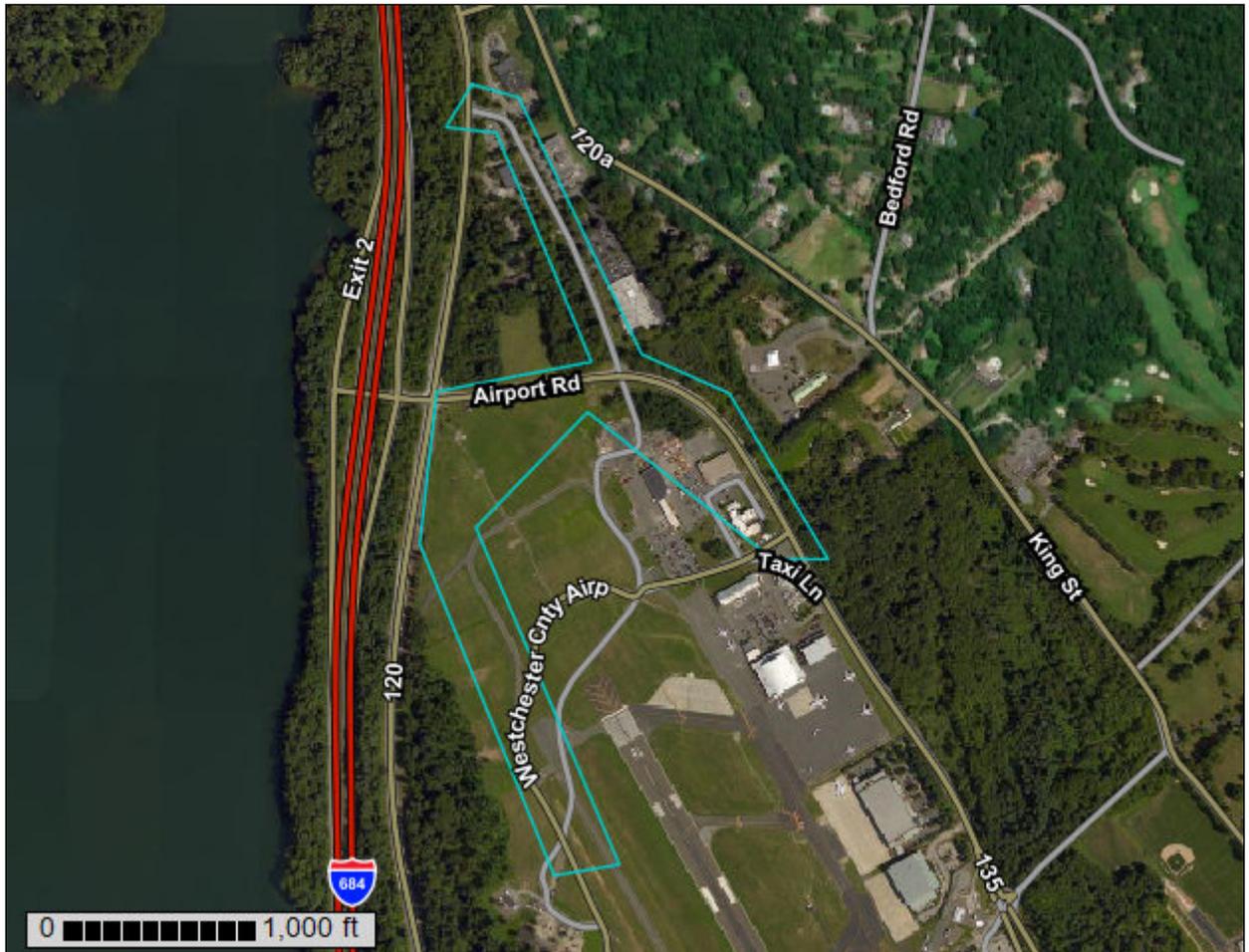


SITE LOCATION MAP

FIGURE 1

Figure 2
Soils Map and Information

Custom Soil Resource Report for State of Connecticut, and Westchester County, New York



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	12
Map Unit Descriptions.....	12
State of Connecticut.....	15
2—Ridgebury fine sandy loam, 0 to 3 percent slopes.....	15
45B—Woodbridge fine sandy loam, 3 to 8 percent slopes.....	16
84B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes.....	18
Westchester County, New York.....	21
ChB—Charlton fine sandy loam, 3 to 8 percent slopes.....	21
PnB—Paxton fine sandy loam, 3 to 8 percent slopes.....	22
RdB—Ridgebury complex, 3 to 8 percent slopes.....	24
Ub—Udorthents, smoothed.....	26
Uf—Urban land.....	27
WdB—Woodbridge loam, 3 to 8 percent slopes.....	28

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

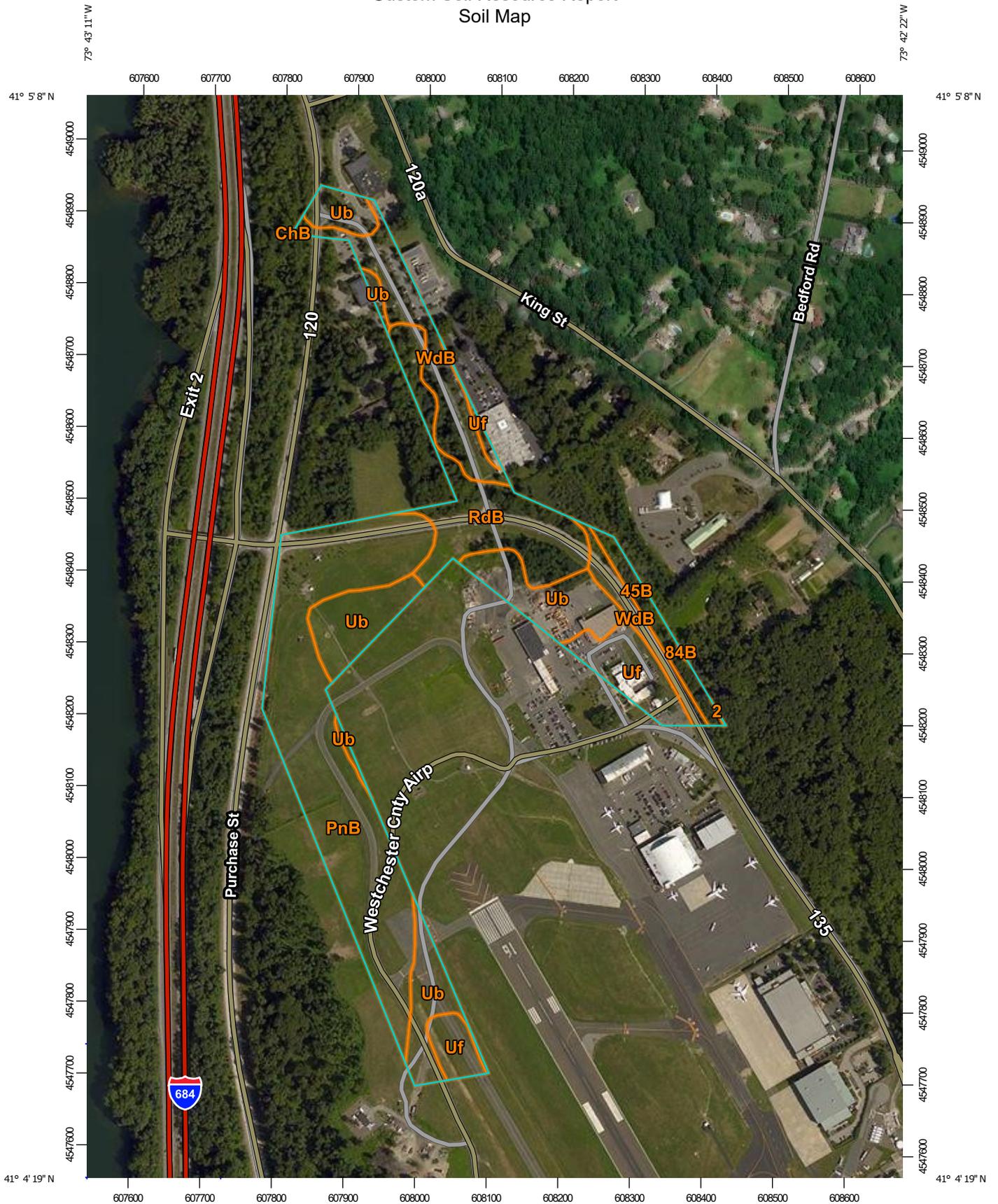
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

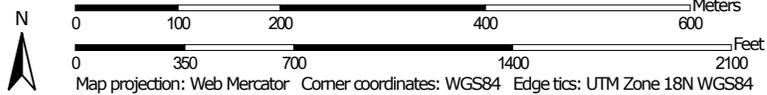
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Map Scale: 1:7,340 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge ticks: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
 Survey Area Data: Version 20, Jun 9, 2020

Soil Survey Area: Westchester County, New York
 Survey Area Data: Version 16, Jun 11, 2020

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Oct 16, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Ridgebury fine sandy loam, 0 to 3 percent slopes	0.0	0.0%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	1.6	3.5%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	0.0	0.0%
Subtotals for Soil Survey Area		1.7	3.6%
Totals for Area of Interest		46.7	100.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ChB	Charlton fine sandy loam, 3 to 8 percent slopes	0.0	0.0%
PnB	Paxton fine sandy loam, 3 to 8 percent slopes	17.4	37.2%
RdB	Ridgebury complex, 3 to 8 percent slopes	6.8	14.6%
Ub	Udorthents, smoothed	10.3	22.1%
Uf	Urban land	4.3	9.2%
WdB	Woodbridge loam, 3 to 8 percent slopes	6.2	13.4%
Subtotals for Soil Survey Area		45.1	96.4%
Totals for Area of Interest		46.7	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Custom Soil Resource Report

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion

Custom Soil Resource Report

of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

State of Connecticut

2—Ridgebury fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2w69f

Elevation: 0 to 1,480 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 140 to 240 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Ridgebury and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury

Setting

Landform: Hills, ground moraines, drainageways, depressions, drumlins

Landform position (two-dimensional): Toeslope, footslope

Landform position (three-dimensional): Base slope, head slope

Down-slope shape: Concave

Across-slope shape: Concave

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material

A - 1 to 6 inches: fine sandy loam

Bw - 6 to 10 inches: sandy loam

Bg - 10 to 19 inches: gravelly sandy loam

Cd - 19 to 66 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 15 to 35 inches to densic material

Drainage class: Poorly drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: About 0 to 6 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water capacity: Low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: D

Ecological site: F144AY009CT - Wet Till Depressions

Hydric soil rating: Yes

Minor Components

Woodbridge

Percent of map unit: 9 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Footslope, summit
Landform position (three-dimensional): Crest, base slope
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Whitman

Percent of map unit: 5 percent
Landform: Depressions, ground moraines, drumlins, drainageways, hills
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Leicester

Percent of map unit: 1 percent
Landform: Depressions, drainageways, hills, ground moraines
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

45B—Woodbridge fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t2ql
Elevation: 0 to 1,470 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Woodbridge, fine sandy loam, and similar soils: 82 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge, Fine Sandy Loam

Setting

Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope

Custom Soil Resource Report

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam

Bw1 - 7 to 18 inches: fine sandy loam

Bw2 - 18 to 30 inches: fine sandy loam

Cd - 30 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 20 to 39 inches to densic material

Drainage class: Moderately well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: About 18 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water capacity: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C/D

Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Minor Components

Paxton

Percent of map unit: 10 percent

Landform: Drumlins, hills, ground moraines

Landform position (two-dimensional): Backslope, summit, shoulder

Landform position (three-dimensional): Side slope, crest, nose slope

Down-slope shape: Linear, convex

Across-slope shape: Convex

Hydric soil rating: No

Ridgebury

Percent of map unit: 8 percent

Landform: Ground moraines, depressions, drainageways, hills

Landform position (two-dimensional): Toeslope, backslope, footslope

Landform position (three-dimensional): Base slope, head slope, dip

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

84B—Paxton and Montauk fine sandy loams, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t2qn
Elevation: 0 to 1,570 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Paxton and similar soils: 55 percent
Montauk and similar soils: 30 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Convex, linear
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 39 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C

Custom Soil Resource Report

Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Description of Montauk

Setting

Landform: Drumlins, hills
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

A - 0 to 4 inches: fine sandy loam
Bw1 - 4 to 14 inches: fine sandy loam
Bw2 - 14 to 25 inches: sandy loam
2Cd1 - 25 to 39 inches: gravelly loamy coarse sand
2Cd2 - 39 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 38 inches to densic material
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 24 to 30 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Ridgebury

Percent of map unit: 5 percent
Landform: Hills, ground moraines, depressions, drainageways
Landform position (two-dimensional): Toeslope, backslope, footslope
Landform position (three-dimensional): Base slope, head slope, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Woodbridge

Percent of map unit: 5 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Custom Soil Resource Report

Charlton

Percent of map unit: 5 percent

Landform: Hills

Down-slope shape: Linear

Across-slope shape: Linear

Hydric soil rating: No

Westchester County, New York

ChB—Charlton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2wh0n
Elevation: 0 to 1,440 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Charlton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Charlton

Setting

Landform: Hills, ground moraines, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy melt-out till derived from granite, gneiss, and/or schist

Typical profile

Ap - 0 to 7 inches: fine sandy loam
Bw - 7 to 22 inches: gravelly fine sandy loam
C - 22 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.14 to 14.17 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: F144AY034CT - Well Drained Till Uplands
Hydric soil rating: No

Minor Components

Sutton

Percent of map unit: 8 percent
Landform: Ground moraines, hills
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Paxton

Percent of map unit: 5 percent
Landform: Drumlins, hills, ground moraines
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear, convex
Across-slope shape: Convex
Hydric soil rating: No

Leicester

Percent of map unit: 1 percent
Landform: Drainageways, depressions
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Chatfield

Percent of map unit: 1 percent
Landform: Hills, ridges
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Crest, side slope, nose slope
Down-slope shape: Convex
Across-slope shape: Linear, convex
Hydric soil rating: No

PnB—Paxton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t2qp
Elevation: 0 to 1,570 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Paxton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Drumlins, ground moraines, hills

Landform position (two-dimensional): Backslope, summit, shoulder

Landform position (three-dimensional): Side slope, crest, nose slope

Down-slope shape: Linear, convex

Across-slope shape: Convex

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam

Bw1 - 8 to 15 inches: fine sandy loam

Bw2 - 15 to 26 inches: fine sandy loam

Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 18 to 39 inches to densic material

Drainage class: Well drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: About 18 to 37 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2s

Hydrologic Soil Group: C

Ecological site: F144AY007CT - Well Drained Dense Till Uplands

Hydric soil rating: No

Minor Components

Woodbridge

Percent of map unit: 9 percent

Landform: Hills, drumlins, ground moraines

Landform position (two-dimensional): Backslope, footslope, summit

Landform position (three-dimensional): Side slope

Down-slope shape: Concave

Across-slope shape: Linear

Hydric soil rating: No

Ridgebury

Percent of map unit: 6 percent

Landform: Drainageways, hills, ground moraines, depressions

Landform position (two-dimensional): Backslope, footslope, toeslope

Landform position (three-dimensional): Head slope, base slope, dip

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Charlton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

RdB—Ridgebury complex, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2xfg2
Elevation: 10 to 1,180 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 145 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Ridgebury, loam, and similar soils: 50 percent
Ridgebury, somewhat poorly drained, and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ridgebury, Loam

Setting

Landform: Drainageways, hills, ground moraines, depressions, drumlins
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oe - 0 to 1 inches: moderately decomposed plant material
A - 1 to 6 inches: loam
Bw - 6 to 10 inches: gravelly fine sandy loam
Bg - 10 to 19 inches: gravelly fine sandy loam
Cd - 19 to 66 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 35 inches to densic material
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: None

Custom Soil Resource Report

Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: Yes

Description of Ridgebury, Somewhat Poorly Drained

Setting

Landform: Hills, ground moraines, depressions, drumlins, drainageways
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Head slope, base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Oa - 0 to 1 inches: highly decomposed plant material
A - 1 to 7 inches: loam
Bw - 7 to 13 inches: loam
Bg - 13 to 21 inches: fine sandy loam
Cd - 21 to 60 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 15 to 35 inches to densic material
Drainage class: Somewhat poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 10 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: D
Ecological site: F144AY009CT - Wet Till Depressions
Hydric soil rating: No

Minor Components

Woodbridge, loam

Percent of map unit: 5 percent
Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex

Custom Soil Resource Report

Across-slope shape: Linear
Hydric soil rating: No

Sun, very poorly drained

Percent of map unit: 5 percent
Landform: Depressions
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Leicester, loam

Percent of map unit: 3 percent
Landform: Drainageways, hills, depressions, ground moraines
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Concave
Hydric soil rating: Yes

Paxton

Percent of map unit: 2 percent
Landform: Hills, ground moraines, drumlins
Landform position (two-dimensional): Backslope, shoulder, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Linear, convex
Hydric soil rating: No

Ub—Udorthents, smoothed

Map Unit Setting

National map unit symbol: bd7f
Elevation: 0 to 2,400 feet
Mean annual precipitation: 46 to 50 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 115 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, smoothed, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Smoothed

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 70 inches: very gravelly loam

Custom Soil Resource Report

Properties and qualities

Slope: 0 to 8 percent

Depth to restrictive feature: 40 to 60 inches to lithic bedrock

Drainage class: Moderately well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.06 to 5.95 in/hr)

Depth to water table: About 18 to 48 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 15 percent

Available water capacity: Low (about 4.6 inches)

Minor Components

Urban land

Percent of map unit: 5 percent

Hydric soil rating: Unranked

Udorthents, wet substratum

Percent of map unit: 5 percent

Hydric soil rating: No

Leicester

Percent of map unit: 2 percent

Hydric soil rating: No

Hollis

Percent of map unit: 2 percent

Hydric soil rating: No

Charlton

Percent of map unit: 2 percent

Hydric soil rating: No

Riverhead

Percent of map unit: 2 percent

Hydric soil rating: No

Sun

Percent of map unit: 2 percent

Landform: Depressions

Hydric soil rating: Yes

Uf—Urban land

Map Unit Setting

National map unit symbol: bd7j

Elevation: 50 to 2,400 feet

Mean annual precipitation: 46 to 50 inches

Mean annual air temperature: 46 to 52 degrees F

Frost-free period: 115 to 215 days

Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Minor Components

Udorthents

Percent of map unit: 5 percent

Hydric soil rating: No

Riverhead

Percent of map unit: 2 percent

Hydric soil rating: No

Chatfield

Percent of map unit: 2 percent

Hydric soil rating: No

Udorthents, wet substratum

Percent of map unit: 2 percent

Hydric soil rating: No

Unadilla

Percent of map unit: 2 percent

Hydric soil rating: No

Sutton

Percent of map unit: 2 percent

Hydric soil rating: No

WdB—Woodbridge loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2w688

Elevation: 0 to 1,280 feet

Mean annual precipitation: 36 to 71 inches

Mean annual air temperature: 39 to 55 degrees F

Frost-free period: 145 to 240 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Woodbridge, loam, and similar soils: 85 percent

Minor components: 15 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Woodbridge, Loam

Setting

Landform: Drumlins, hills, ground moraines

Landform position (two-dimensional): Summit, backslope, footslope

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Convex

Custom Soil Resource Report

Across-slope shape: Linear

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 6 inches: loam

Bw1 - 6 to 18 inches: gravelly loam

Bw2 - 18 to 29 inches: gravelly loam

Cd - 29 to 65 inches: gravelly loam

Properties and qualities

Slope: 3 to 8 percent

Depth to restrictive feature: 20 to 39 inches to densic material

Drainage class: Moderately well drained

Runoff class: Very high

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)

Depth to water table: About 18 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Available water capacity: Low (about 4.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C/D

Ecological site: F144AY037MA - Moist Dense Till Uplands

Hydric soil rating: No

Minor Components

Ridgebury

Percent of map unit: 7 percent

Landform: Drainageways, hills, ground moraines, depressions, drumlins

Landform position (two-dimensional): Toeslope, footslope

Landform position (three-dimensional): Head slope, base slope

Down-slope shape: Concave

Across-slope shape: Concave

Hydric soil rating: Yes

Paxton

Percent of map unit: 7 percent

Landform: Ground moraines, drumlins, hills

Landform position (two-dimensional): Summit, shoulder, backslope

Landform position (three-dimensional): Crest, side slope

Down-slope shape: Linear, convex

Across-slope shape: Convex

Hydric soil rating: No

Sutton

Percent of map unit: 1 percent

Landform: Hills, ground moraines

Landform position (two-dimensional): Footslope

Landform position (three-dimensional): Base slope

Down-slope shape: Concave

Across-slope shape: Linear

Custom Soil Resource Report

Hydric soil rating: No

Custom Soil Resource Report for **Westchester County, New York**



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Preface	2
How Soil Surveys Are Made	5
Soil Map	8
Soil Map.....	9
Legend.....	10
Map Unit Legend.....	11
Map Unit Descriptions.....	11
Westchester County, New York.....	13
PnB—Paxton fine sandy loam, 3 to 8 percent slopes.....	13
PnC—Paxton fine sandy loam, 8 to 15 percent slopes.....	14
Ub—Udorthents, smoothed.....	16

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Map Scale: 1:872 if printed on A landscape (11" x 8.5") sheet.

0 10 20 40 60 Meters

0 40 80 160 240 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Westchester County, New York
 Survey Area Data: Version 16, Jun 11, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 21, 2014—Aug 27, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
PnB	Paxton fine sandy loam, 3 to 8 percent slopes	0.3	14.6%
PnC	Paxton fine sandy loam, 8 to 15 percent slopes	0.0	1.3%
Ub	Udorthents, smoothed	2.0	84.1%
Totals for Area of Interest		2.4	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

Custom Soil Resource Report

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Westchester County, New York

PnB—Paxton fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2t2qp
Elevation: 0 to 1,570 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Paxton and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Drumlins, ground moraines, hills
Landform position (two-dimensional): Backslope, summit, shoulder
Landform position (three-dimensional): Side slope, crest, nose slope
Down-slope shape: Linear, convex
Across-slope shape: Convex
Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 18 to 39 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2s
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Woodbridge

Percent of map unit: 9 percent
Landform: Hills, drumlins, ground moraines
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 6 percent
Landform: Drainageways, hills, ground moraines, depressions
Landform position (two-dimensional): Backslope, footslope, toeslope
Landform position (three-dimensional): Head slope, base slope, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Charlton

Percent of map unit: 5 percent
Landform: Hills
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

PnC—Paxton fine sandy loam, 8 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2w66y
Elevation: 0 to 1,320 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Paxton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Paxton

Setting

Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear, convex
Across-slope shape: Convex

Custom Soil Resource Report

Parent material: Coarse-loamy lodgment till derived from gneiss, granite, and/or schist

Typical profile

Ap - 0 to 8 inches: fine sandy loam
Bw1 - 8 to 15 inches: fine sandy loam
Bw2 - 15 to 26 inches: fine sandy loam
Cd - 26 to 65 inches: gravelly fine sandy loam

Properties and qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 39 inches to densic material
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.14 in/hr)
Depth to water table: About 18 to 37 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water capacity: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F144AY007CT - Well Drained Dense Till Uplands
Hydric soil rating: No

Minor Components

Charlton

Percent of map unit: 7 percent
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Woodbridge

Percent of map unit: 6 percent
Landform: Ground moraines, drumlins, hills
Landform position (two-dimensional): Backslope, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Ridgebury

Percent of map unit: 2 percent
Landform: Drumlins, hills, ground moraines, depressions, drainageways
Landform position (two-dimensional): Toeslope, footslope
Landform position (three-dimensional): Base slope, head slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Hydric soil rating: Yes

Ub—Udorthents, smoothed

Map Unit Setting

National map unit symbol: bd7f
Elevation: 0 to 2,400 feet
Mean annual precipitation: 46 to 50 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 115 to 215 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents, smoothed, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Smoothed

Typical profile

H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 70 inches: very gravelly loam

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: 40 to 60 inches to lithic bedrock
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high
(0.06 to 5.95 in/hr)
Depth to water table: About 18 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 15 percent
Available water capacity: Low (about 4.6 inches)

Minor Components

Urban land

Percent of map unit: 5 percent
Hydric soil rating: Unranked

Udorthents, wet substratum

Percent of map unit: 5 percent
Hydric soil rating: No

Leicester

Percent of map unit: 2 percent
Hydric soil rating: No

Hollis

Percent of map unit: 2 percent
Hydric soil rating: No

Custom Soil Resource Report

Charlton

Percent of map unit: 2 percent
Hydric soil rating: No

Riverhead

Percent of map unit: 2 percent
Hydric soil rating: No

Sun

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

Figure 3
FEMA Flood Maps

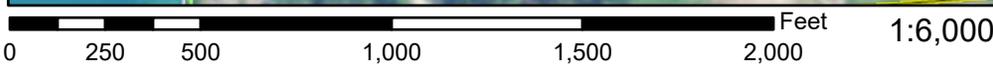
National Flood Hazard Layer FIRMMette



73°43'12"W 41°4'48"N



USGS The National Map: Orthoimagery. Data refreshed October, 2020.



73°42'35"W 41°4'21"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
		Area of Undetermined Flood Hazard <i>Zone D</i>

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

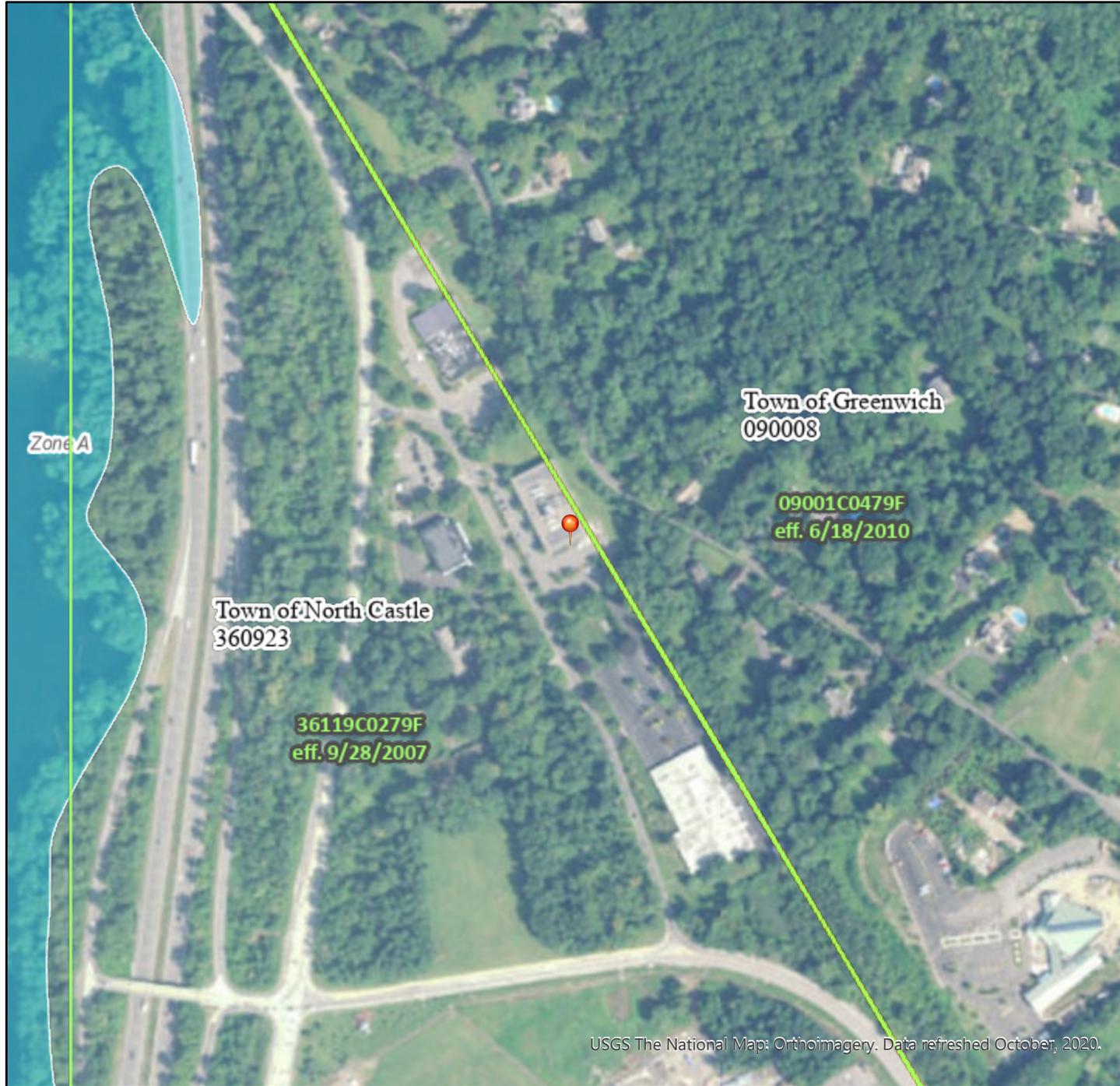
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **12/23/2020 at 12:28 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMette



73°43'10"W 41°5'13"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
		Area of Undetermined Flood Hazard <i>Zone D</i>

GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped

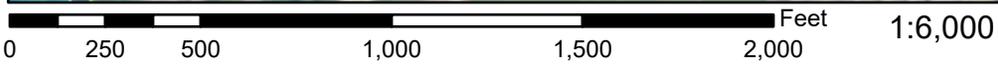
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **12/28/2020 at 3:50 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

USGS The National Map: Orthoimagery. Data refreshed October, 2020.

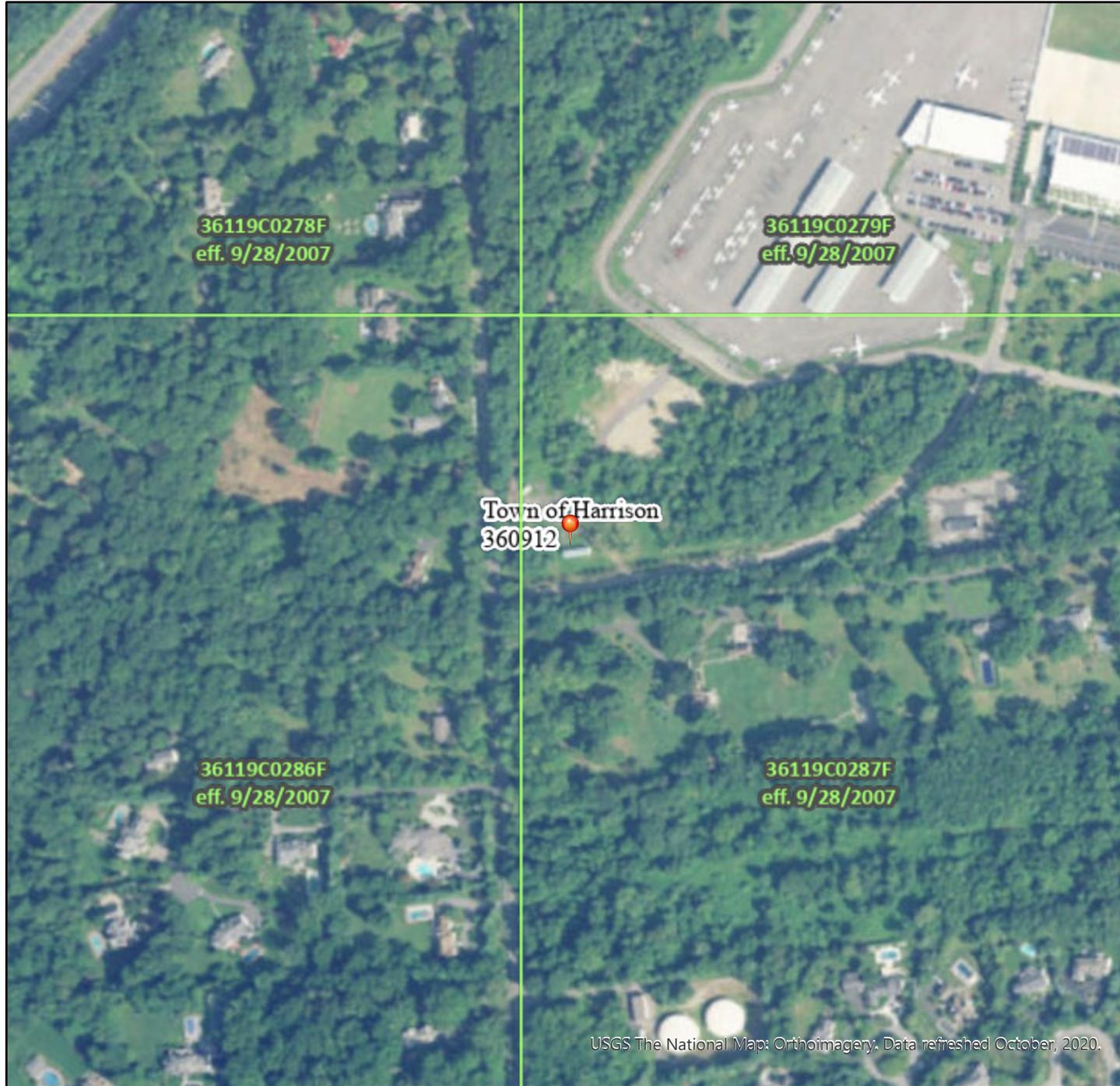


73°42'32"W 41°4'46"N

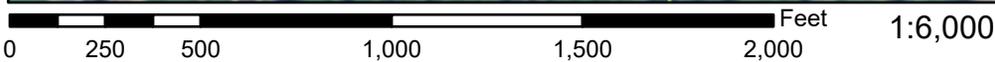
National Flood Hazard Layer FIRMette



73°43'25"W 41°3'53"N



USGS The National Map: Orthoimagery. Data refreshed October, 2020.



73°42'47"W 41°3'26"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) <i>Zone A, V, A99</i>
		With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i>
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i>
		Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i>
		Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i>
		Area with Flood Risk due to Levee <i>Zone D</i>
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i>
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard <i>Zone D</i>
		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
MAP PANELS		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Digital Data Available
		No Digital Data Available
		Unmapped



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **12/23/2020 at 12:26 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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Appendix B
Notice of Intent

NOI for coverage under Stormwater General Permit for Construction Activity

version 1.35

(Submission #: HPN-6XCF-BWR6R, version 1)

Details

Originally Started By Jovena Gjuraj
Alternate Identifier Westchester County Airport
Submission ID HPN-6XCF-BWR6R
Submission Reason New
Status Draft

Form Input

Owner/Operator Information

Owner/Operator Name (Company/Private Owner/Municipality/Agency/Institution, etc.)

Westchester County

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Greechan

Owner/Operator Contact Person First Name

Hugh

Owner/Operator Mailing Address

148 Martine Avneue

City

White Plains

State

New York

Zip

10601

Phone

914-995-3361

Email

jadc@westchestergov.com

Federal Tax ID

NONE PROVIDED

Project Location

Project/Site Name

Westchester County Airport

Street Address (Not P.O. Box)

240 Airport Rd

Side of Street

East

City/Town/Village (THAT ISSUES BUILDING PERMIT)

Westchester County

State

NY

Zip

10604

DEC Region

3

County

WESTCHESTER

Name of Nearest Cross Street

Route 120

Distance to Nearest Cross Street (Feet)

NONE PROVIDED

Project In Relation to Cross Street

East

Tax Map Numbers Section-Block-Parcel

119.03,1,6

Tax Map Numbers

NONE PROVIDED

1. Coordinates

Provide the Geographic Coordinates for the project site. The two methods are:

- Navigate to the project location on the map (below) and click to place a marker and obtain the XY coordinates.

- The "Find Me" button will provide the lat/long for the person filling out this form. Then pan the map to the correct location and click the map to place a marker and obtain the XY coordinates.

Navigate to your location and click on the map to get the X,Y coordinates

41.06835136607617,-73.7087345123291

Project Details**2. What is the nature of this project?**

Redevelopment with no increase in impervious area

3. Select the predominant land use for both pre and post development conditions.**Pre-Development Existing Landuse**

Other: Airport

Post-Development Future Land Use

Other: Airport

3a. If Single Family Subdivision was selected in question 3, enter the number of subdivision lots.

NONE PROVIDED

4. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area.

*** ROUND TO THE NEAREST TENTH OF AN ACRE. ***

Total Site Area (acres)

702

Total Area to be Disturbed (acres)

0.5

Existing Impervious Area to be Disturbed (acres)

0.22

Future Impervious Area Within Disturbed Area (acres)

0.22

5. Do you plan to disturb more than 5 acres of soil at any one time?

No

6. Indicate the percentage (%) of each Hydrologic Soil Group(HSG) at the site.**A (%)**

0

B (%)

0

C (%)

100

D (%)

0

7. Is this a phased project?

No

8. Enter the planned start and end dates of the disturbance activities.**Start Date**

04/03/2023

End Date

09/01/2024

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Rye Lake

9a. Type of waterbody identified in question 9?

Lake Off Site

Other Waterbody Type Off Site Description

NONE PROVIDED

9b. If "wetland" was selected in 9A, how was the wetland identified?

NONE PROVIDED

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-20-001?

No

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001?

Yes

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters?

Yes

If No, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as D (provided the map unit name is inclusive of slopes greater than 25%), E or F on the USDA Soil Survey?

No

If Yes, what is the acreage to be disturbed?

NONE PROVIDED

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?

No

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?

No

16. What is the name of the municipality/entity that owns the separate storm sewer system?

NONE PROVIDED

17. Does any runoff from the site enter a sewer classified as a Combined Sewer?

No

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law?

No

19. Is this property owned by a state authority, state agency, federal government or local government?

Yes

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.)

No

Required SWPPP Components

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)?

Yes

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)?

No

If you answered No in question 22, skip question 23 and the Post-construction Criteria and Post-construction SMP Identification sections.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual?

NONE PROVIDED

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:
Professional Engineer (P.E.)

SWPPP Preparer

D&B Engineers and Architects

Contact Name (Last, Space, First)

Merklin, William

Mailing Address

330 Crossways Park Drive

City

Woodbury

State

New York

Zip

11797

Phone

516-364-9890

Email

bmerklin@db-eng.com

Download SWPPP Preparer Certification Form

Please take the following steps to prepare and upload your preparer certification form:

- 1) Click on the link below to download a blank certification form
- 2) The certified SWPPP preparer should sign this form

3) Scan the signed form

4) Upload the scanned document

[Download SWPPP Preparer Certification Form](#)

Please upload the SWPPP Preparer Certification

NONE PROVIDED

Comment

NONE PROVIDED

Erosion & Sediment Control Criteria

25. Has a construction sequence schedule for the planned management practices been prepared?

Yes

26. Select all of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

Dust Control

Construction Road Stabilization

Silt Fence

Stabilized Construction Entrance

Storm Drain Inlet Protection

Biotechnical

None

Vegetative Measures

Protecting Vegetation

Seeding

Permanent Structural

None

Other

NONE PROVIDED

Post-Construction Criteria

*** IMPORTANT: Completion of Questions 27-39 is not required if response to Question 22 is No.**

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

NONE PROVIDED

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

NONE PROVIDED

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout). (Acre-feet)

NONE PROVIDED

29. Post-construction SMP Identification

Use the Post-construction SMP Identification section to identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity that were used to reduce the Total WQv Required (#28).

Identify the SMPs to be used by providing the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use the Post-Construction SMP Identification section to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29. (acre-feet)

NONE PROVIDED

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28)?

NONE PROVIDED

If Yes, go to question 36. If No, go to question 32.

32. Provide the Minimum RRv required based on HSG. [Minimum RRv Required = (P) (0.95) (Ai) / 12, Ai=(s) (Aic)] (acre-feet)

NONE PROVIDED

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

NONE PROVIDED

If Yes, go to question 33.

Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.

If No, sizing criteria has not been met; therefore, NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. SMPs

Use the Post-construction SMP Identification section to identify the Standard SMPs and, if applicable, the Alternative SMPs to be used to treat the remaining total WQv (=Total WQv Required in #28 - Total RRv Provided in #30).

Also, provide the total impervious area that contributes runoff to each practice selected.

NOTE: Use the Post-construction SMP Identification section to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question #29. (acre-feet)

NONE PROVIDED

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a).

NONE PROVIDED

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)?

NONE PROVIDED

If Yes, go to question 36.

If No, sizing criteria has not been met; therefore, NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv required and provided or select waiver (#36a), if applicable.**CPv Required (acre-feet)**

NONE PROVIDED

CPv Provided (acre-feet)

NONE PROVIDED

36a. The need to provide channel protection has been waived because:

NONE PROVIDED

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (#37a), if applicable.**Overbank Flood Control Criteria (Qp)****Pre-Development (CFS)**

NONE PROVIDED

Post-Development (CFS)

NONE PROVIDED

Total Extreme Flood Control Criteria (Qf)**Pre-Development (CFS)**

NONE PROVIDED

Post-Development (CFS)

NONE PROVIDED

37a. The need to meet the Qp and Qf criteria has been waived because:

NONE PROVIDED

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed?

NONE PROVIDED

If Yes, Identify the entity responsible for the long term Operation and Maintenance

NONE PROVIDED

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). (See question #32a) This space can also be used for other pertinent project information.

NONE PROVIDED

Post-Construction SMP Identification**Runoff Reduction (RR) Techniques, Standard Stormwater Management Practices (SMPs) and Alternative SMPs**

Identify the Post-construction SMPs to be used by providing the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

RR Techniques (Area Reduction)

Round to the nearest tenth

Total Contributing Acres for Conservation of Natural Area (RR-1)

NONE PROVIDED

Total Contributing Impervious Acres for Conservation of Natural Area (RR-1)

NONE PROVIDED

Total Contributing Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)

NONE PROVIDED

Total Contributing Impervious Acres for Sheetflow to Riparian Buffers/Filter Strips (RR-2)

NONE PROVIDED

Total Contributing Acres for Tree Planting/Tree Pit (RR-3)

NONE PROVIDED

Total Contributing Impervious Acres for Tree Planting/Tree Pit (RR-3)

NONE PROVIDED

Total Contributing Acres for Disconnection of Rooftop Runoff (RR-4)

NONE PROVIDED

RR Techniques (Volume Reduction)

Total Contributing Impervious Acres for Disconnection of Rooftop Runoff (RR-4)

NONE PROVIDED

Total Contributing Impervious Acres for Vegetated Swale (RR-5)

NONE PROVIDED

Total Contributing Impervious Acres for Rain Garden (RR-6)

NONE PROVIDED

Total Contributing Impervious Acres for Stormwater Planter (RR-7)

NONE PROVIDED

Total Contributing Impervious Acres for Rain Barrel/Cistern (RR-8)

NONE PROVIDED

Total Contributing Impervious Acres for Porous Pavement (RR-9)

NONE PROVIDED

Total Contributing Impervious Acres for Green Roof (RR-10)

NONE PROVIDED

Standard SMPs with RRv Capacity

Total Contributing Impervious Acres for Infiltration Trench (I-1)

NONE PROVIDED

Total Contributing Impervious Acres for Infiltration Basin (I-2)

NONE PROVIDED

Total Contributing Impervious Acres for Dry Well (I-3)

NONE PROVIDED

Total Contributing Impervious Acres for Underground Infiltration System (I-4)

NONE PROVIDED

Total Contributing Impervious Acres for Bioretention (F-5)

NONE PROVIDED

Total Contributing Impervious Acres for Dry Swale (O-1)

NONE PROVIDED

Standard SMPs

Total Contributing Impervious Acres for Micropool Extended Detention (P-1)

NONE PROVIDED

Total Contributing Impervious Acres for Wet Pond (P-2)

NONE PROVIDED

Total Contributing Impervious Acres for Wet Extended Detention (P-3)

NONE PROVIDED

Total Contributing Impervious Acres for Multiple Pond System (P-4)

NONE PROVIDED

Total Contributing Impervious Acres for Pocket Pond (P-5)

NONE PROVIDED

Total Contributing Impervious Acres for Surface Sand Filter (F-1)

NONE PROVIDED

Total Contributing Impervious Acres for Underground Sand Filter (F-2)

NONE PROVIDED

Total Contributing Impervious Acres for Perimeter Sand Filter (F-3)

NONE PROVIDED

Total Contributing Impervious Acres for Organic Filter (F-4)

NONE PROVIDED

Total Contributing Impervious Acres for Shallow Wetland (W-1)

NONE PROVIDED

Total Contributing Impervious Acres for Extended Detention Wetland (W-2)

NONE PROVIDED

Total Contributing Impervious Acres for Pond/Wetland System (W-3)

NONE PROVIDED

Total Contributing Impervious Acres for Pocket Wetland (W-4)

NONE PROVIDED

Total Contributing Impervious Acres for Wet Swale (O-2)

NONE PROVIDED

Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Total Contributing Impervious Area for Hydrodynamic

NONE PROVIDED

Total Contributing Impervious Area for Wet Vault

NONE PROVIDED

Total Contributing Impervious Area for Media Filter

NONE PROVIDED

"Other" Alternative SMP?

NONE PROVIDED

Total Contributing Impervious Area for "Other"

NONE PROVIDED

Provide the name and manufacturer of the alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

Manufacturer of Alternative SMP

NONE PROVIDED

Name of Alternative SMP

NONE PROVIDED

Other Permits

40. Identify other DEC permits, existing and new, that are required for this project/facility.

None

If SPDES Multi-Sector GP, then give permit ID

NONE PROVIDED

If Other, then identify

NONE PROVIDED

41. Does this project require a US Army Corps of Engineers Wetland Permit?

Yes

If "Yes," then indicate Size of Impact, in acres, to the nearest tenth

NONE PROVIDED

42. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned.

NONE PROVIDED

MS4 SWPPP Acceptance**43. Is this project subject to the requirements of a regulated, traditional land use control MS4?**

Yes - Please attach the MS4 Acceptance form below

If No, skip question 44**44. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI?**

NONE PROVIDED

MS4 SWPPP Acceptance Form Download

Download form from the link below. Complete, sign, and upload.

[MS4 SWPPP Acceptance Form](#)**MS4 Acceptance Form Upload**

NONE PROVIDED

Comment

NONE PROVIDED

Owner/Operator Certification**Owner/Operator Certification Form Download**

Download the certification form by clicking the link below. Complete, sign, scan, and upload the form.

[Owner/Operator Certification Form \(PDF, 45KB\)](#)**Upload Owner/Operator Certification Form**

NONE PROVIDED

Comment

NONE PROVIDED

Appendix C

Owner/Operator Certification Form

Appendix D
SWPPP Preparer Certification
Form



SWPPP Preparer Certification Form

*SPDES General Permit for Stormwater
Discharges From Construction Activity
(GP-0-20-001)*

Project Site Information Project/Site Name

Owner/Operator Information Owner/Operator (Company Name/Private Owner/Municipality Name)

Certification Statement – SWPPP Preparer

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First name

MI

Last Name

Signature

Date

Appendix E

Erosion and Sediment Control Plan Review Checklist

APPENDIX E

EROSION AND SEDIMENT CONTROL PLAN REVIEW CHECKLIST

Project Name _____ Site Location _____

Applicant's Name & Address _____

General

A narrative statement shall be provided that describes the proposed project nature and purpose; the existing site conditions including topography, vegetation and drainage; adjacent and off-site areas affected by the project; description of the soils on the site and key properties; notations of critical areas such as steep slopes, channels or wetlands; the overall phasing, sequencing and stabilization plan; total disturbed area and, areas not to be disturbed, and soil restoration plan.

I. Construction Drawings

Are the following items shown on the construction drawings:	<u>Yes</u>	<u>No</u>
1. Vicinity Map with scale and north arrow	_____	_____
2. Legend, scales, N arrow on plan view	_____	_____
3. Existing and proposed topography shown with contours labeled with spots elevations in critical areas	_____	_____
4. Scope of the plan noted in the Title Block	_____	_____
5. Limits of clearing and grading shown , and methods of spoil disposal	_____	_____
6. Existing vegetation delineated	_____	_____
7. Soil boundaries shown on the existing and proposed plan views	_____	_____
8. Existing drainage patterns, 100 year floodplain and sub-areas shown, runoff outfall locations identified	_____	_____
9. Existing and proposed development facilities/ improvements shown	_____	_____
10. Location of Erosion and Sediment control practices as phased with construction, with dimensions and material specifications	_____	_____
11. Phasing plan with 5 acre threshold limits shown	_____	_____
12. Stockpile locations, staging areas, access points, and concrete trunk washout locations clearly defined	_____	_____
13. Street profiles, utility locations, property boundaries and, easement delineations shown	_____	_____
14. Soil Restoration Plan detailed on the site plan	_____	_____

II.	<u>Construction Notes & Details</u>	<u>Yes</u>	<u>No</u>
	1. Specific sequence of operation given for each phase	_____	_____
	2. Inspection and maintenance schedule shown for the specific practices	_____	_____
	3. Design details show all dimensions and installation details necessary for construction	_____	_____
	4. Implementation schedule for E&S practices is provided with removal criteria stated	_____	_____
	5. Site pollution and construction waste management plan incorporated in the notes	_____	_____
	6. Site Inspections during construction are noted on the drawings and are in accordance with the General Permit for Stormwater Discharges from Construction Activities	_____	_____

III. Erosion & Sediment Control Practices

A.	General	<u>Yes</u>	<u>No</u>
	1. Practice meets purpose and design criteria	_____	_____
	2. Standard details and construction notes are provided	_____	_____
	3. Special timing of practice noted if applicable	_____	_____
	4. Provisions for traffic crossings shown on the drawings where necessary	_____	_____

B.	Practices Controlling Runoff	<u>Yes</u>	<u>No</u>
	1. Positive drainage is maintained with contributing drainage area shown	_____	_____
	2. Flow grades properly stabilized	_____	_____
	3. Adequate outlet or discharge condition stabilized	_____	_____
	4. Necessary dimensions, gradations, calculations, and materials shown	_____	_____

C.	Practices Stabilizing Soil	<u>Yes</u>	<u>No</u>
	1. Seeding rates and areas properly shown on the drawings	_____	_____
	2. Mulch materials and rates specified on the drawings	_____	_____
	3. Sequencing and timing provisions limit soil exposure to 7 to 14 days as appropriate	_____	_____

C. Practices Stabilizing Soil (cont'd)	<u>Yes</u>	<u>No</u>
4. Rolled Erosion Control Products (RECP's) used are specified to location and appropriate weight/tie down	_____	_____
5. All soil seed bed preparation and amendments are specified on the drawings or in the specifications	_____	_____
6. The seeding dates are specified to cover the entire year for both temporary and permanent seedings	_____	_____
7. Maximum created slopes are no steeper than 2 foot horizontal to 1 foot vertical with Cut and Fill slopes shown	_____	_____

D. Practices Controlling Sediment	<u>Yes</u>	<u>No</u>
1. Sediment traps/basins are sized in accordance with criteria	_____	_____
2. The contributing drainage area is shown on the grading plan	_____	_____
3. All scaled dimensions and volumes are shown on the plan	_____	_____
4. Maintenance requirements and clean out elevations established for all sediment control practices (50% capacity)	_____	_____
5. All access points of the project are shown to be stabilized	_____	_____
6. Storm drain inlets adequately protected	_____	_____
7. Buffer filter strips are appropriately sited and installed	_____	_____
7. Silt fences are shown on the contour lines with no more than one quarter acre per 100 foot drainage to it	_____	_____
8. Temporary sediment traps are not being used at locations of future stormwater infiltration facilities	_____	_____
9. Dewatering devices for traps and basins are adequately designed with details shown on the plans	_____	_____
10. Geotextile filter bags are properly sited, sized, and have their maintenance requirements detailed on the drawings	_____	_____
11. Turbidity curtains are properly located with installation, anchoring, and maintenance details shown on the plans	_____	_____

Additional Comments and Notes

Plan Reviewed By: _____ Date: _____

Appendix F

Construction Site Inspection and Maintenance Log Book

APPENDIX F
CONSTRUCTION SITE INSPECTION
AND MAINTENANCE LOG BOOK

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION
ACTIVITIES

SAMPLE CONSTRUCTION SITE LOG BOOK

Table of Contents

- I. Pre-Construction Meeting Documents
 - a. Preamble to Site Assessment and Inspections
 - b. Pre-Construction Site Assessment Checklist

- II. Construction Duration Inspections
 - a. Directions
 - b. Modification to the SWPPP

I. PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name _____
Permit No. _____ **Date of Authorization** _____
Name of Operator _____
Prime Contractor _____

a. Preamble to Site Assessment and Inspections

The Following Information To Be Read By All Person’s Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified inspector¹ conduct an assessment of the site prior to the commencement of construction² and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State’s standards and meets all Federal, State and local erosion and sediment control requirements. A preconstruction meeting should be held to review all of the SWPPP requirements with construction personnel.

When construction starts, site inspections shall be conducted by the qualified inspector at least every 7 calendar days. The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified inspector perform a final site inspection. The qualified inspector shall certify that the site has undergone final stabilization³ using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 Refer to “Qualified Inspector” inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.
2 “Commencement of construction” means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.
3 “Final stabilization” means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Pre-construction Site Assessment Checklist

(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

- Has a Notice of Intent been filed with the NYS Department of Conservation?
- Is the SWPPP on-site? Where? _____
- Is the Plan current? What is the latest revision date? _____
- Is a copy of the NOI (with brief description) onsite? Where? _____
- Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

- Are construction limits clearly flagged or fenced?
- Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
- Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

- Clean stormwater runoff has been diverted from areas to be disturbed.
- Bodies of water located either on site or in the vicinity of the site have been identified and protected.
- Appropriate practices to protect on-site or downstream surface water are installed.
- Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Access

Yes No NA

- A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
- Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
- Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Sediment Controls

Yes No NA

- Silt fence material and installation comply with the standard drawing and specifications.
- Silt fences are installed at appropriate spacing intervals
- Sediment/detention basin was installed as first land disturbing activity.
- Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

- The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
- The plan is contained in the SWPPP on page _____
- Appropriate materials to control spills are onsite. Where? _____

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

Inspection Forms will be filled out during the entire construction phase of the project.

Required Elements:

- 1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;
- 2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;
- 3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;
- 4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);
- 5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and
- 6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

Inspector (print name)

Date of Inspection

Qualified Inspector (print name)

Qualified Inspector Signature

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality

Yes No NA

- Is there an increase in turbidity causing a substantial visible contrast to natural conditions at the outfalls?
- Is there residue from oil and floating substances, visible oil film, or globules or grease at the outfalls?
- All disturbance is within the limits of the approved plans.
- Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes No NA

- Is construction site litter, debris and spoils appropriately managed?
- Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
- Is construction impacting the adjacent property?
- Is dust adequately controlled?

2. Temporary Stream Crossing

Yes No NA

- Maximum diameter pipes necessary to span creek without dredging are installed.
- Installed non-woven geotextile fabric beneath approaches.
- Is fill composed of aggregate (no earth or soil)?
- Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

3. Stabilized Construction Access

Yes No NA

- Stone is clean enough to effectively remove mud from vehicles.
- Installed per standards and specifications?
- Does all traffic use the stabilized entrance to enter and leave site?
- Is adequate drainage provided to prevent ponding at entrance?

Runoff Control Practices

1. Excavation Dewatering

Yes No NA

- Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
- Clean water from upstream pool is being pumped to the downstream pool.
- Sediment laden water from work area is being discharged to a silt-trapping device.
- Constructed upstream berm with one-foot minimum freeboard.

Runoff Control Practices (continued)

2. Flow Spreader

Yes No NA

- Installed per plan.
- Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
- Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA

- Installed per plan with minimum side slopes 2H:1V or flatter.
- Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
- Sediment-laden runoff directed to sediment trapping structure

4. Stone Check Dam

Yes No NA

- Is channel stable? (flow is not eroding soil underneath or around the structure).
- Check is in good condition (rocks in place and no permanent pools behind the structure).
- Has accumulated sediment been removed?.

5. Rock Outlet Protection

Yes No NA

- Installed per plan.
- Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

- Stockpiles are stabilized with vegetation and/or mulch.
- Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

- Temporary seedings and mulch have been applied to idle areas.
- 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Silt Fence and Linear Barriers

Yes No NA

- Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
 - Joints constructed by wrapping the two ends together for continuous support.
 - Fabric buried 6 inches minimum.
 - Posts are stable, fabric is tight and without rips or frayed areas.
- Sediment accumulation is ___% of design capacity.

Sediment Control Practices (continued)

2. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated; Filter Sock or Manufactured practices)

Yes No NA

- Installed concrete blocks lengthwise so open ends face outward, not upward.
 - Placed wire screen between No. 3 crushed stone and concrete blocks.
 - Drainage area is 1acre or less.
 - Excavated area is 900 cubic feet.
 - Excavated side slopes should be 2:1.
 - 2" x 4" frame is constructed and structurally sound.
 - Posts 3-foot maximum spacing between posts.
 - Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
 - Posts are stable, fabric is tight and without rips or frayed areas.
 - Manufactured insert fabric is free of tears and punctures.
 - Filter Sock is not torn or flattened and fill material is contained within the mesh sock.
- Sediment accumulation ___% of design capacity.

3. Temporary Sediment Trap

Yes No NA

- Outlet structure is constructed per the approved plan or drawing.
 - Geotextile fabric has been placed beneath rock fill.
 - Sediment trap slopes and disturbed areas are stabilized.
- Sediment accumulation is ___% of design capacity.

4. Temporary Sediment Basin

Yes No NA

- Basin and outlet structure constructed per the approved plan.
 - Basin side slopes are stabilized with seed/mulch.
 - Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
 - Sediment basin dewatering pool is dewatering at appropriate rate.
- Sediment accumulation is ___% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

Appendix G

Contractor/Subcontractor SPDES Permit Certification

Contractor / Subcontractor SPDES Permit Certification

Contract No.: _____ PIN: _____

Description: _____

Town, Village, City: _____

County: _____

Check Applicable Box: Prime Contractor Subcontractor

Name of Contractor/
Subcontractor: _____

Address: _____

City: _____ State: _____ ZIP: _____

Phone: _____ Fax: _____

Core Pay Item Groups for which the Contractor/Subcontractor will be responsible (e.g. 203, 207, 209, etc.): _____

Mandatory Certification: The SPDES General Permit for Stormwater Discharges from Construction Activities requires the Prime Contractor and subcontractors to certify they understand the Stormwater Pollution Prevention Plan (SWPPP), the General Permit conditions, and their responsibilities for compliance. The certification must be signed prior to performing any contract work. The certification shall be signed by an Owner, Principal, President, Secretary or Treasurer of the firm in accordance with the signature requirements of 102-05 *Proposal Submission* of the Standard Specifications.

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information, that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations."

Signature: _____ Date: _____

Name: _____ Title: _____

Required Training: Effective April 30, 2010, the SPDES General Permit also requires the Prime Contractor and all subcontractors **performing earthwork or soil-disturbing activities** to identify at least one trained individual **from each company** who will be responsible for implementing the SWPPP and who shall be on-site on a daily basis when the company is performing soil disturbance activities. These activities include clearing, grubbing, grading, filling, excavation, stockpiling, demolition, landscaping, and installation and maintenance of Erosion & Sediment Control practices. Training must consist of 4 hours of NYSDEC-endorsed Erosion & Sediment Control Training every 3 years. (Training is not required if the individual is a licensed Professional Engineer, registered licensed Landscape Architect, or CPESC.) Provide the information below for trained individuals who will be on-site and responsible for SWPPP implementation on this Contract (attach a separate sheet if needed for additional Trained Individuals):

Trained Individual Name/Title : _____

Name of Training Course: _____

Trainee Number: _____ Date of Training: _____

Trained Individual Name/Title : _____

Name of Training Course: _____

Trainee Number: _____ Date of Training: _____

Appendix H
Notice of Termination

**New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505**

(NOTE: Submit completed form to address above)

**NOTICE OF TERMINATION for Storm Water Discharges Authorized
under the SPDES General Permit for Construction Activity**

Please indicate your permit identification number: NYR _____

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person:

4a. Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. *Date final stabilization completed (month/year): _____

9b. Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR _____
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? yes no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? yes no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

**NOTICE OF TERMINATION for Storm Water Discharges Authorized under the
SPDES General Permit for Construction Activity - continued**

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? yes no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

- Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.
- Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).
- For post-construction stormwater management practices that are privately owned, a mechanism is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record.
- For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____
(acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? yes
 no
(If Yes, complete section VI - "MS4 Acceptance" statement)

V. Additional Information/Explanation:
(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:

Date:

**NOTICE OF TERMINATION for Storm Water Discharges Authorized under the
SPDES General Permit for Construction Activity - continued**

VII. Qualified Inspector Certification - Final Stabilization:

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:

Title/Position:

Signature:

Date:

VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:

Title/Position:

Signature:

Date:

IX. Owner or Operator Certification

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:

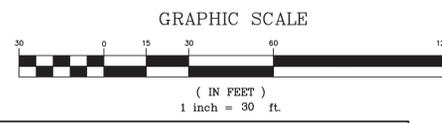
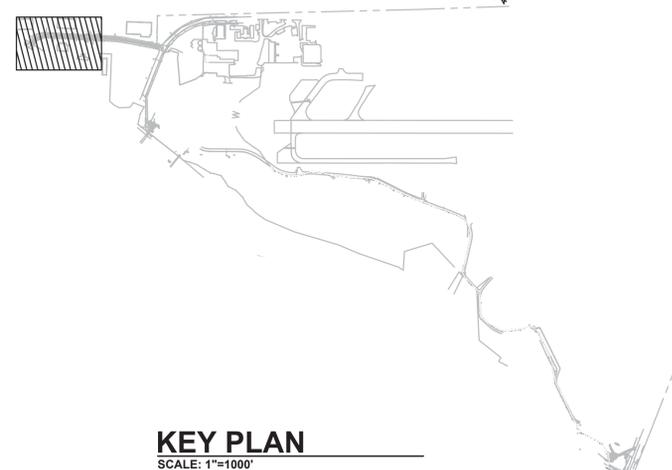
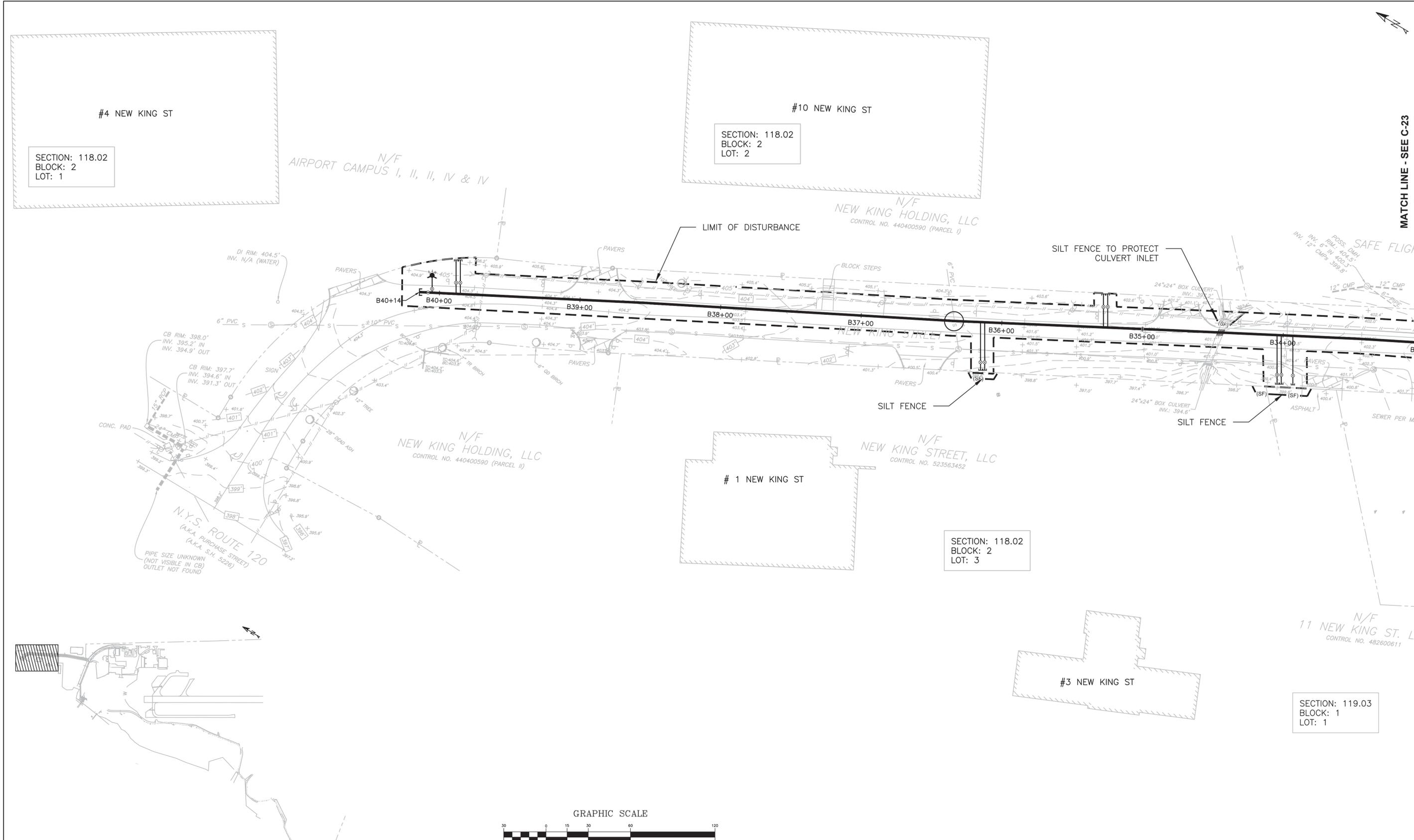
Title/Position:

Signature:

Date:

Appendix I
Erosion and Sediment Control
Plans

MATCH LINE - SEE C-23



KEY PLAN
 SCALE: 1"=1000'

100% REVIEW 10-10-22 NOT FOR CONSTRUCTION

OLA Consulting Engineers
 50 Broadway,
 Hawthorne, NY 10532
 914.747.2800
 8 West 38th Street,
 Suite 501
 New York, NY 10018
 646.849.4110
 olace.com NWC60027.00

D&B ENGINEERS AND ARCHITECTS
 WHITE PLAINS, NEW YORK 10604
 (914) 467-5300

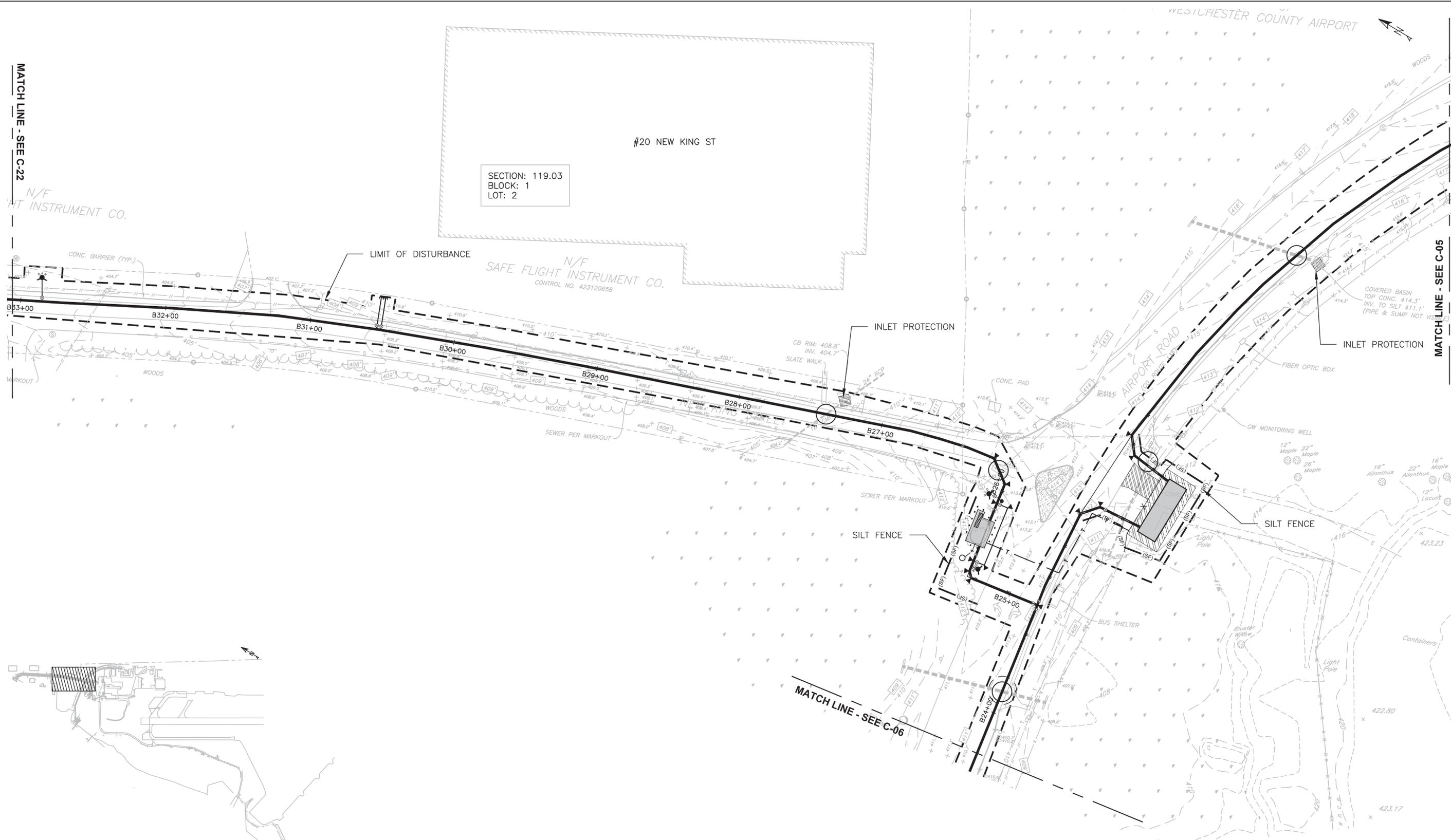
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REVISION NUMBER	DATE	MADE BY	APP'D BY	REVISION

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CONTRACTOR		PROJECT COORDINATOR	
NAME _____	NAME _____	NAME _____	NAME _____
SIGNATURE _____	SIGNATURE _____	SIGNATURE _____	SIGNATURE _____
TITLE _____	TITLE _____	TITLE _____	TITLE _____
DATE _____	DATE _____	DATE _____	DATE _____

WESTCHESTER COUNTY, NEW YORK
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
 DIVISION OF ENGINEERING
 DOMESTIC WATER SYSTEM IMPROVEMENTS, WESTCHESTER COUNTY AIRPORT
 TOWNS OF HARRISON, NORTH CASTLE & VILLAGE OF RYE BROOK
 CIVIL
 EROSION AND SEDIMENT CONTROL PLAN NO. 1

CONTRACT NUMBER 22-522	SHEET NUMBER C-22
SHEET NO. ## OF ##	
SCALE: AS SHOWN	
DATE: 10-12-2022	
DPW FILE NO.	REV. NO.



MATCH LINE - SEE C-22

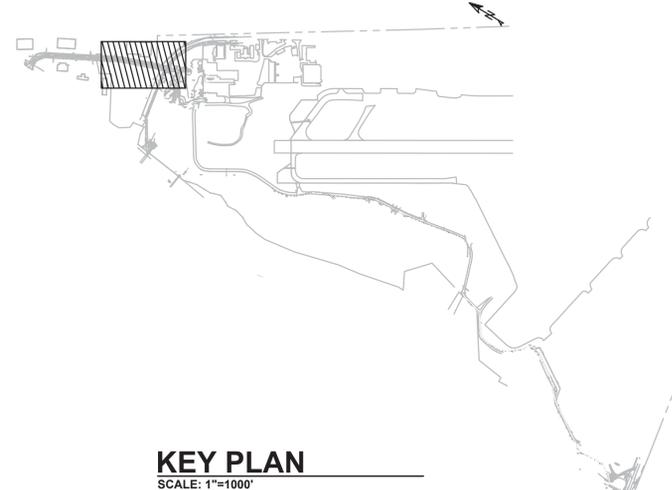
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SAFE FLIGHT INSTRUMENT CO.

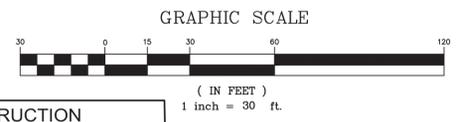
SECTION: 119.03
BLOCK: 1
LOT: 2

N/F
SAFE FLIGHT INSTRUMENT CO.
CONTROL NO. 423120558

COVERED BASIN
TOP CONC. 414.3'
INV. TO SILT 411.1'
(PIPE & SUMP NOT VISIBLE)



KEY PLAN
SCALE: 1"=1000'



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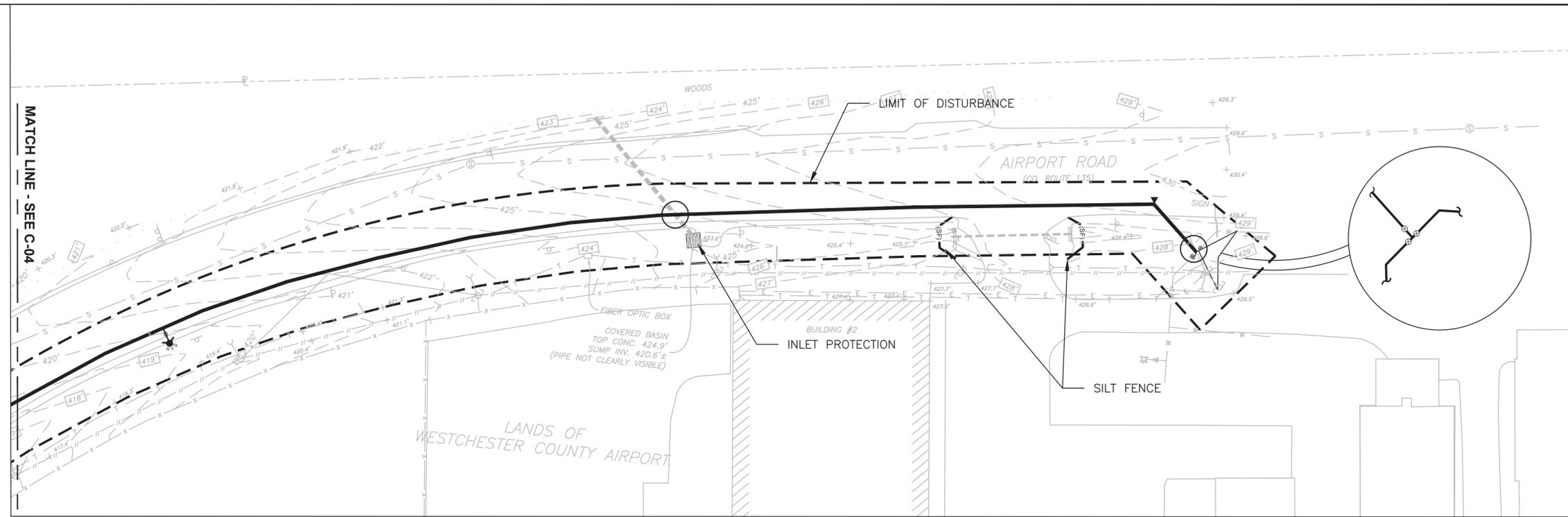
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CONTRACTOR PROJECT COORDINATOR

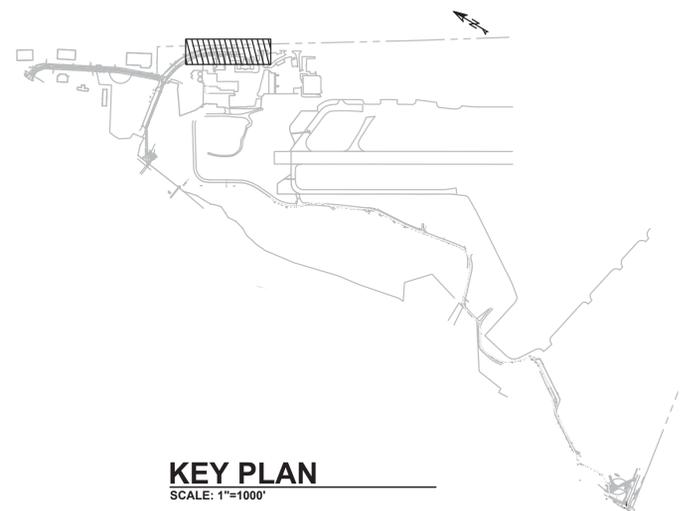
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SIGNATURE _____ SIGNATURE _____
TITLE _____ DATE _____ TITLE _____ DATE _____

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DIVISION OF ENGINEERING
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TOWNS OF HARRISON, NORTH CASTLE & VILLAGE OF RYE BROOK
CIVIL
EROSION AND SEDIMENT CONTROL PLAN NO. 2

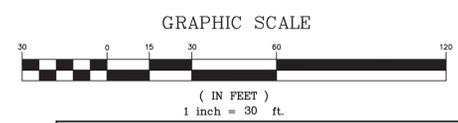
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MATCH LINE - SEE C-04



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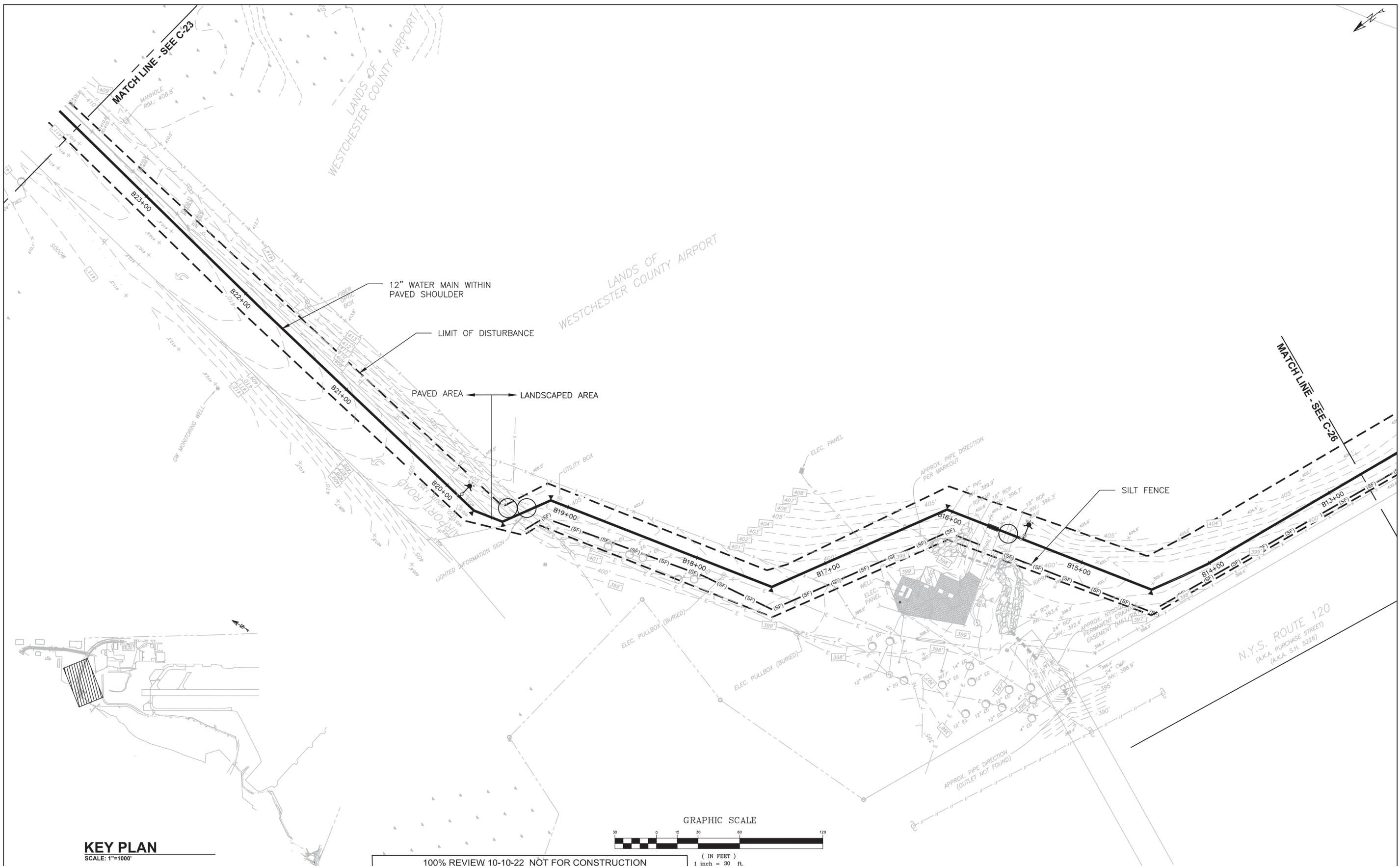
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CONTRACTOR		PROJECT COORDINATOR	
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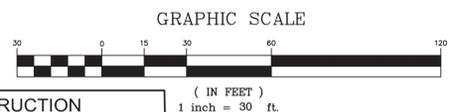
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DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
DIVISION OF ENGINEERING

DOMESTIC WATER SYSTEM IMPROVEMENTS, WESTCHESTER COUNTY AIRPORT
TOWNS OF HARRISON, NORTH CASTLE & VILLAGE OF RYE BROOK
CIVIL
EROSION AND SEDIMENT CONTROL PLAN NO. 3

CONTRACT NUMBER 22-522	SHEET NUMBER C-24
SHEET NO. ## OF ##	
SCALE: AS SHOWN	
DATE: 10-12-2022	
DPW FILE NO.	REV. NO.



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SCALE: 1"=1000'



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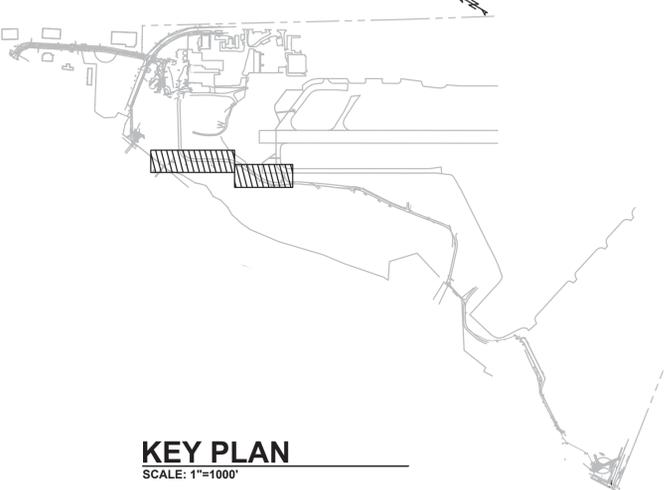
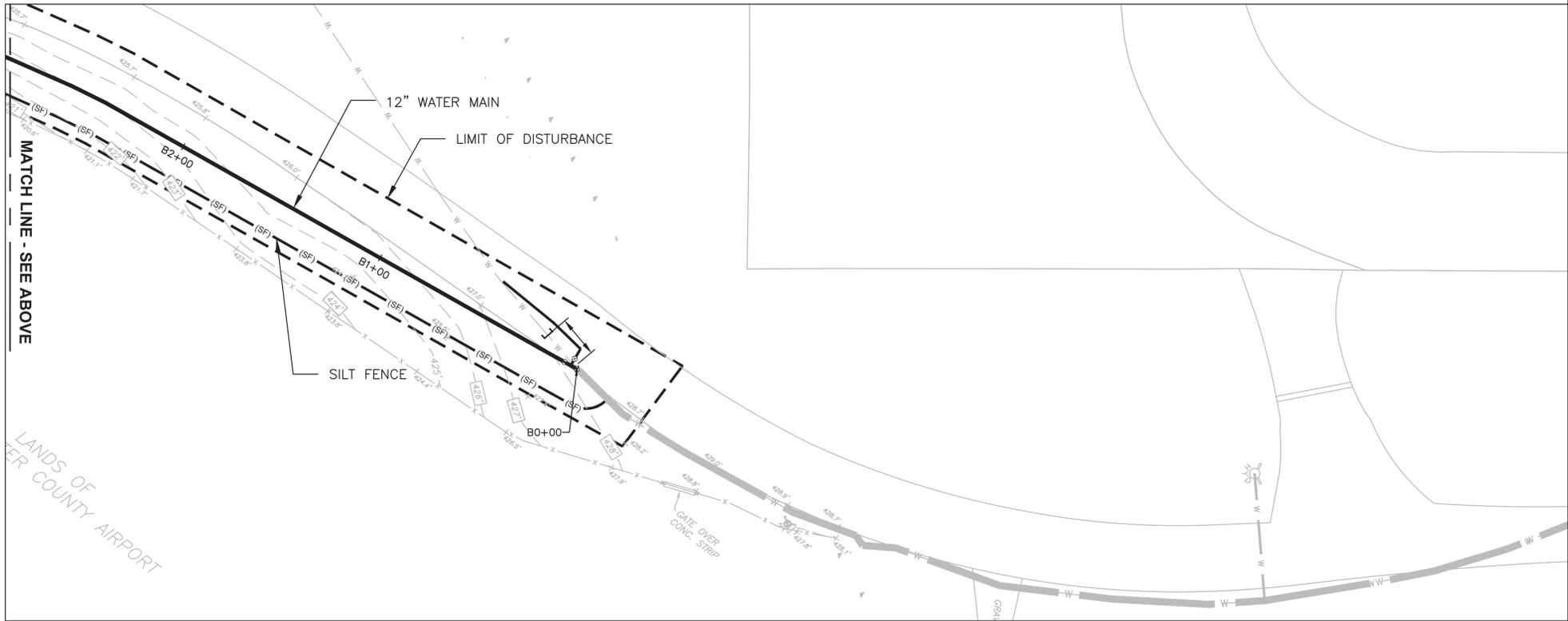
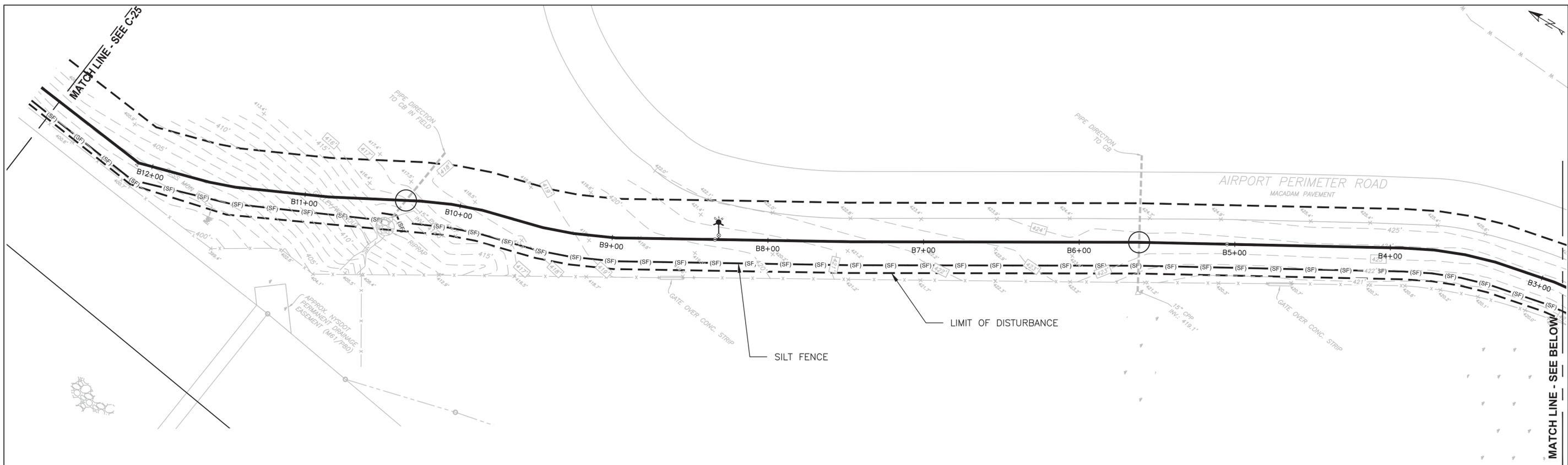
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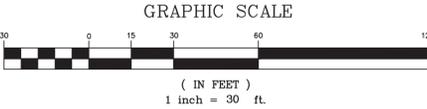
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CONTRACTOR		PROJECT COORDINATOR	
NAME _____	NAME _____	NAME _____	NAME _____
SIGNATURE _____	SIGNATURE _____	SIGNATURE _____	SIGNATURE _____
TITLE _____	TITLE _____	TITLE _____	TITLE _____
DATE _____	DATE _____	DATE _____	DATE _____

WESTCHESTER COUNTY, NEW YORK		CONTRACT NUMBER	SHEET NUMBER
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION		22-522	C-25
DIVISION OF ENGINEERING		SHEET NO. ##	OF ##
DOMESTIC WATER SYSTEM IMPROVEMENTS, WESTCHESTER COUNTY AIRPORT		SCALE: AS SHOWN	
TOWNS OF HARRISON, NORTH CASTLE & VILLAGE OF RYE BROOK		DATE: 10-12-2022	
CIVIL		DPW FILE NO.	REV. NO.
EROSION AND SEDIMENT CONTROL PLAN NO. 4			



KEY PLAN
SCALE: 1"=1000'



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olace.com NWC60027.00

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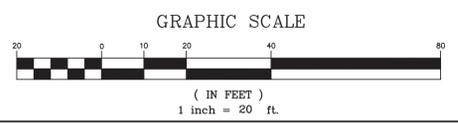
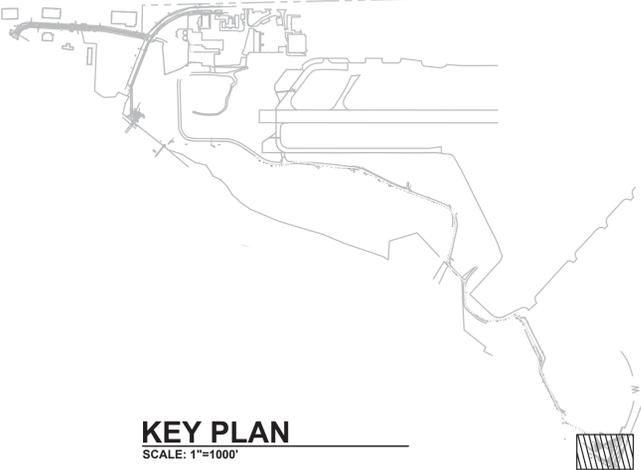
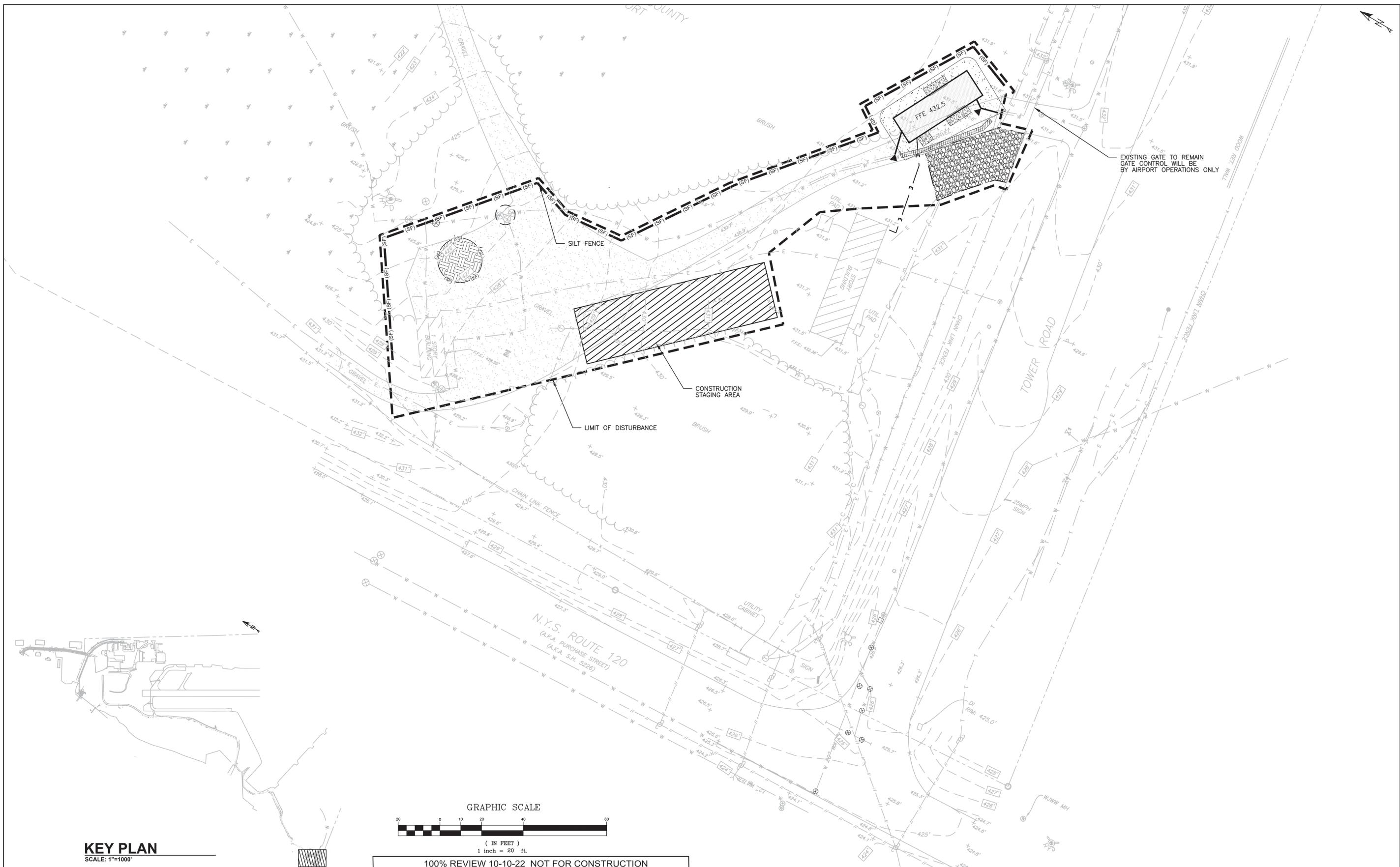
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WESTCHESTER COUNTY, NEW YORK
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
DIVISION OF ENGINEERING
DOMESTIC WATER SYSTEM IMPROVEMENTS, WESTCHESTER COUNTY AIRPORT
TOWNS OF HARRISON, NORTH CASTLE & VILLAGE OF RYE BROOK
CIVIL
EROSION AND SEDIMENT CONTROL PLAN NO. 5

CONTRACT NUMBER 22-522	SHEET NUMBER C-26
SHEET NO. ## OF ##	
SCALE: AS SHOWN	
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KEY PLAN
 SCALE: 1"=1000'

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OLA Consulting Engineers
 50 Broadway,
 Hawthorne, NY 10532
 914.747.2800
 8 West 38th Street,
 Suite 501
 New York, NY 10018
 646.849.4110
 olace.com NWC60027.00

D&B ENGINEERS AND ARCHITECTS
 WHITE PLAINS, NEW YORK 10604
 (914) 467-5300

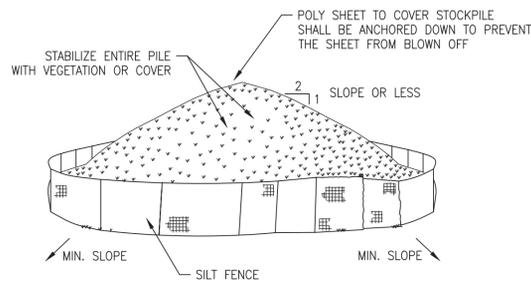
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WESTCHESTER COUNTY, NEW YORK
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
 DIVISION OF ENGINEERING
 DOMESTIC WATER SYSTEM IMPROVEMENTS, WESTCHESTER COUNTY AIRPORT
 TOWNS OF HARRISON, NORTH CASTLE & VILLAGE OF RYE BROOK
 CIVIL
 EROSION AND SEDIMENT CONTROL PLAN NO. 6

CONTRACT NUMBER 22-522	SHEET NUMBER C-27
SHEET NO. ## OF ##	
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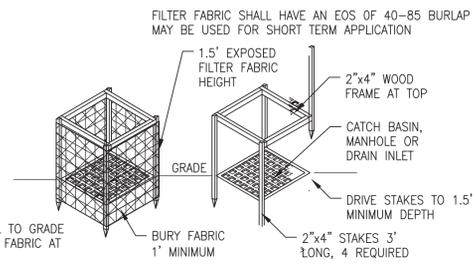


INSTALLATION NOTES:

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 1:2.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAWBALES, THEN STABILIZED WITH VEGETATION OR COVERED.
4. LOCATION CHOSEN TO BE APPROVED BY OWNER.

1 STOCK PILE PROTECTION
NOT TO SCALE

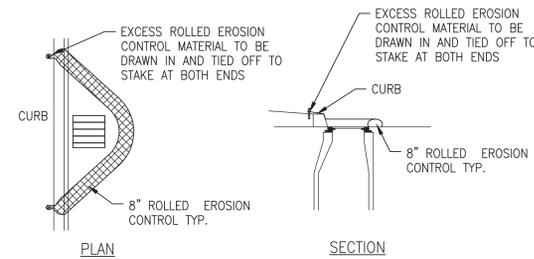
REPRODUCED FROM NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL



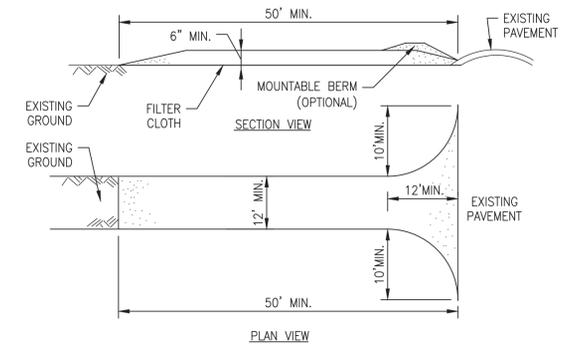
NOTES:

1. GENERAL AREA AROUND INLET ±6' FROM FILTER FABRIC MAY BE EXCAVATED TO 1' DEPTH AS WATER POOL SEDIMENT TRAP
2. SET SILT FENCE PROTECTION AROUND INLET FRAME OR AS CLOSE TO FRAME AS FEASIBLE FOR STABLE STAKING

2 FILTER FABRIC INLET PROTECTION
NOT TO SCALE



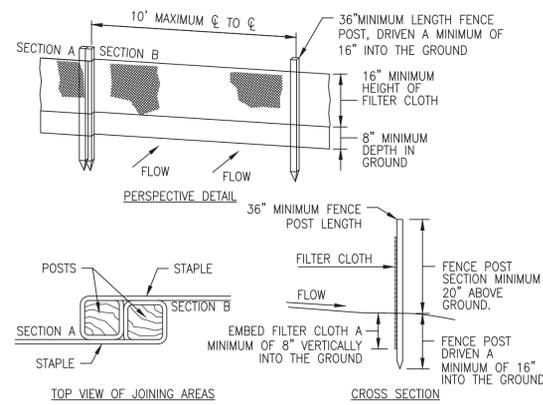
3 CATCH BASIN/MANHOLE INLET PROTECTION
NOT TO SCALE



NOTES:

1. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT, LENGTH - NOT LESS THAN 50 FEET AND THICKNESS - NOT LESS THAN SIX (6) INCHES.
2. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
3. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
4. 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.
5. 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.
6. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON A AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
7. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.
8. STABILIZED CONSTRUCTION ENTRANCES SHALL BE COORDINATED WITH THE OWNER AND AT ALL CONSTRUCTION STAGING AREAS.

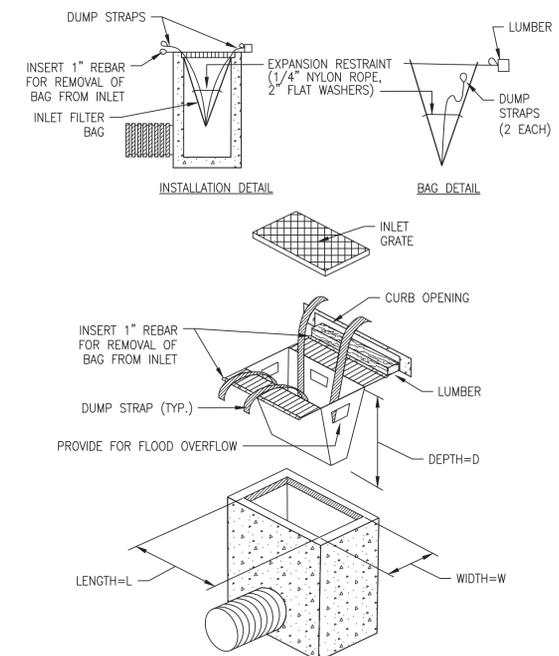
4 STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE



NOTES:

1. WHERE ENDS OF THE FILTER CLOTH COME TOGETHER, THEY SHALL BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS.
2. ALL SILT FENCES SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE.
3. THE AREA BELOW THE FENCE MUST BE UNDISTURBED OR STABILIZED.
4. FENCE POSTS (FOR FABRIC UNITS): THE LENGTH SHALL BE A MINIMUM OF 36 INCHES LONG. WOOD POSTS 2" X 2" WITH A MINIMUM CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES WILL BE OF SOUND QUALITY HARDWOOD. STEEL POSTS WILL BE STANDARD T OR U SECTION WEIGHT NOT LESS THAN 1.00 POUND PER LINEAR FOOT.

5 SILT FENCE
NOT TO SCALE



6 INLET FILTER DETAILS
NOT TO SCALE

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50 Broadway,
Hawthorne, NY 10532
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New York, NY 10018
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WESTCHESTER COUNTY, NEW YORK
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
DIVISION OF ENGINEERING
DOMESTIC WATER SYSTEM IMPROVEMENTS, WESTCHESTER COUNTY AIRPORT TOWNS OF HARRISON, NORTH CASTLE & VILLAGE OF RYE BROOK
CIVIL
EROSION AND SEDIMENT CONTROL DETAILS

CONTRACT NUMBER 22-522	SHEET NUMBER C-28
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APPENDIX 6

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering



George Latimer, Westchester County Executive
County Board of Legislators

**Hazardous Materials Assessment Report
for
Hangar D Pump House, Hangar E Pump House
and Tower Road Backflow Preventor Building**

Westchester County Airport
White Plains, New York

October 2020

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering



**HAZARDOUS MATERIALS ASSESSMENT REPORT
HANGAR D PUMP HOUSE, HANGAR E PUMP HOUSE AND
TOWER ROAD BACKFLOW PREVENTOR BUILDING
WESTCHESTER COUNTY AIRPORT
240 AIRPORT ROAD
WHITE PLAINS, NEW YORK**

Prepared for:

**WESTCHESTER COUNTY
WHITE PLAINS, NEW YORK**

AND

**OLA CONSULTING ENGINEERS
HAWTHORNE, NEW YORK**

Prepared by:

**D&B ENGINEERS AND ARCHITECTS, P.C.
WOODBURY, NEW YORK**

OCTOBER 2020

**HAZARDOUS MATERIALS ASSESSMENT REPORT
HANGAR D PUMP HOUSE, HANGAR E PUMP HOUSE AND
TOWER ROAD BACKFLOW PREVENTOR BUILDING
WESTCHESTER COUNTY AIRPORT
WHITE PLAINS, NEW YORK**

TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.0	INTRODUCTION.....	1-1
1.1	Limitations	1-2
1.2	Qualifications.....	1-2
2.0	FACILITY DESCRIPTION	2-1
3.0	METHODOLOGY	3-1
3.1	Asbestos-Containing Materials.....	3-1
3.2	Lead-Based Paint	3-2
3.3	Polychlorinated Biphenyls.....	3-4
3.4	Universal Waste	3-5
3.5	Refrigerant-Containing Equipment.....	3-6
3.6	Chemical and Petroleum Products	3-6
3.7	Miscellaneous Items, Materials and Equipment	3-7
4.0	FINDINGS	4-1
4.1	Asbestos-Containing Materials.....	4-1
4.2	Lead-Based Paint	4-2
4.3	Polychlorinated Biphenyls.....	4-4
4.4	Universal Waste	4-4
4.5	Refrigerant-Containing Equipment.....	4-5
4.6	Chemical and Petroleum Products	4-5
4.7	Miscellaneous Items, Materials and Equipment	4-6
5.0	CONCLUSIONS	5-1
6.0	RECOMMENDATIONS.....	6-1
6.1	Asbestos-Containing Materials.....	6-1
6.2	Lead-Containing Materials	6-1

TABLE OF CONTENTS (continued)

<u>Section</u>	<u>Title</u>	<u>Page</u>
6.3	Polychlorinated Biphenyls	6-2
6.4	Universal Waste	6-3
6.5	Chemical and Petroleum Products	6-3

List of Appendices

Asbestos Licenses	A
Sample Summary Tables	B
Laboratory Results, Chain of Custody Records and Laboratory Certifications	C
Sample Location Plans.....	D
Asbestos Location Plans	E

List of Figures

2-1	Site Location Map.....	2-2
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1.0 INTRODUCTION

D&B Engineers and Architects, P.C. (D&B) was retained by Westchester County and OLA Consulting Engineers (OLA) to perform a hazardous materials assessment of the Hangar D Pump House, Hangar E Pump House and Tower Road Backflow Preventor Building located at Westchester County Airport at 240 Airport Road in White Plains, New York. The assessment included the interior and exterior portions of each of these buildings. It is D&B's understanding that Westchester County is planning improvements and upgrades to these existing structures. The objective of this hazardous materials assessment is to determine the presence, extent and condition of any hazardous materials that may be present at these three buildings at the time of the field inspection.

The field activities associated with this hazardous materials assessment were performed on June 17 and 18, 2020.

The findings contained within this report are consistent with accepted principles and practices established and prescribed by the United States Environmental Protection Agency (USEPA) and the New York State Department of Labor (NYSDOL) with respect to asbestos and lead-based paint surveys and reporting. In addition, the waste management procedures outlined herein are consistent with the regulations established by the USEPA and the New York State Department of Environmental Conservation (NYSDEC).

Section 2.0 of this report contains a physical description of the property and buildings located on-site. Section 3.0 of this report contains the methodology employed during the performance of this hazardous materials assessment. The findings of the assessment are presented in Section 4.0, and the conclusions and recommendations of the assessment are presented in Sections 5.0 and 6.0, respectively.

1.1 Limitations

D&B assumes no responsibility, liability or risk for the use of this report for any purpose other than as an assessment to be used for informational purposes only. The contents of this report, including the findings, results, conclusions and recommendations presented herein, are based on information available at the time of the actual on-site survey. Only observable materials were assessed. Destructive activities to identify concealed materials were not performed in order to avoid compromising the weather-tight condition of the structures. Furthermore, due to the potential for concealed materials to be present (e.g., within walls, equipment, etc.), this report should not be construed to represent all hazardous materials located in the buildings; all quantities of hazardous materials identified and all dimensions referenced in this report shall be considered approximate and shall be verified on-site.

The lead-based paint survey performed as part of this assessment was intended to determine whether lead-based paint is present within the surveyed areas for waste management purposes only (only one sample was collected per coated building component). The lead-based paint survey was not performed to satisfy the requirements of a lead-based paint survey per USEPA or the United States Department of Housing and Urban Development (HUD). In addition, the lead-based paint survey was not performed to identify lead-containing materials for the purpose of complying with the United States Department of Labor Occupational Safety and Health Administration's (OSHA's) "Lead in Construction" Rule (29 CFR 1926.62).

1.2 Qualifications

D&B Engineers and Architects, P.C. has the experience and certifications necessary to perform a hazardous materials survey for the buildings located on the subject property. Specifically, D&B is in possession of a New York State Department of Labor (NYSDOL) Asbestos Handling License (License No. 28587), as well as a lead-based paint certification issued by the United States Environmental Protection Agency (USEPA) (Certification No. NY-I-17775-2). In addition, the individuals performing the survey are certified inspectors under the NYSDOL asbestos inspection program and the USEPA lead assessment program. Lastly, the inspectors have

the training and experience necessary to identify waste materials that require special handling under the USEPA and NYSDEC environmental regulations. Copies of the applicable asbestos licenses are presented in Appendix A of this report.

2.0 FACILITY DESCRIPTION

Westchester County Airport is located at 240 Airport Road in White Plains, New York (see Figure 2-1). The 702-acre airport has two asphalt paved runways, a terminal, parking garage, hangars and numerous other facilities. These facilities are provided with both domestic and fire protection service via a 12-inch buried line that runs around the airport and includes some support buildings. Among these buildings are the Hangar D Pump House, Hangar E Pump House and Tower Road Backflow Preventor Building, which are the focus of this hazardous materials assessment.

The Hangar D Pump House is an approximate 1,075-square-foot, one-story building with a high ceiling located in the northeastern portion of the airport property that houses pumping equipment. The building floor is concrete, the walls are concrete, and the ceiling is metal trusses overlain with concrete panels. The roof of the building is a roof membrane and insulation system covered with small concrete blocks.

The Hangar E Pump House is an approximate 720-square-foot, one-story building with a high ceiling located in the southwestern portion of the airport property that houses pumping equipment. The building floor is concrete, the walls are concrete, and the ceiling is metal trusses overlain with concrete panels. The roof of the building is a roof membrane and insulation system covered with small concrete blocks. A diesel generator and 500-gallon diesel fuel tank are located inside the building, and a second diesel generator and diesel fuel day tank are located outside on the north side of the building.

The Tower Road Backflow Preventor Building is an approximate 350-square-foot, one-story slab-on-grade building located in the southwestern portion of the airport property that houses backflow prevention equipment. The building floor, walls and ceiling are concrete. The roof of the building is concrete panels with roof tar located between the panels.

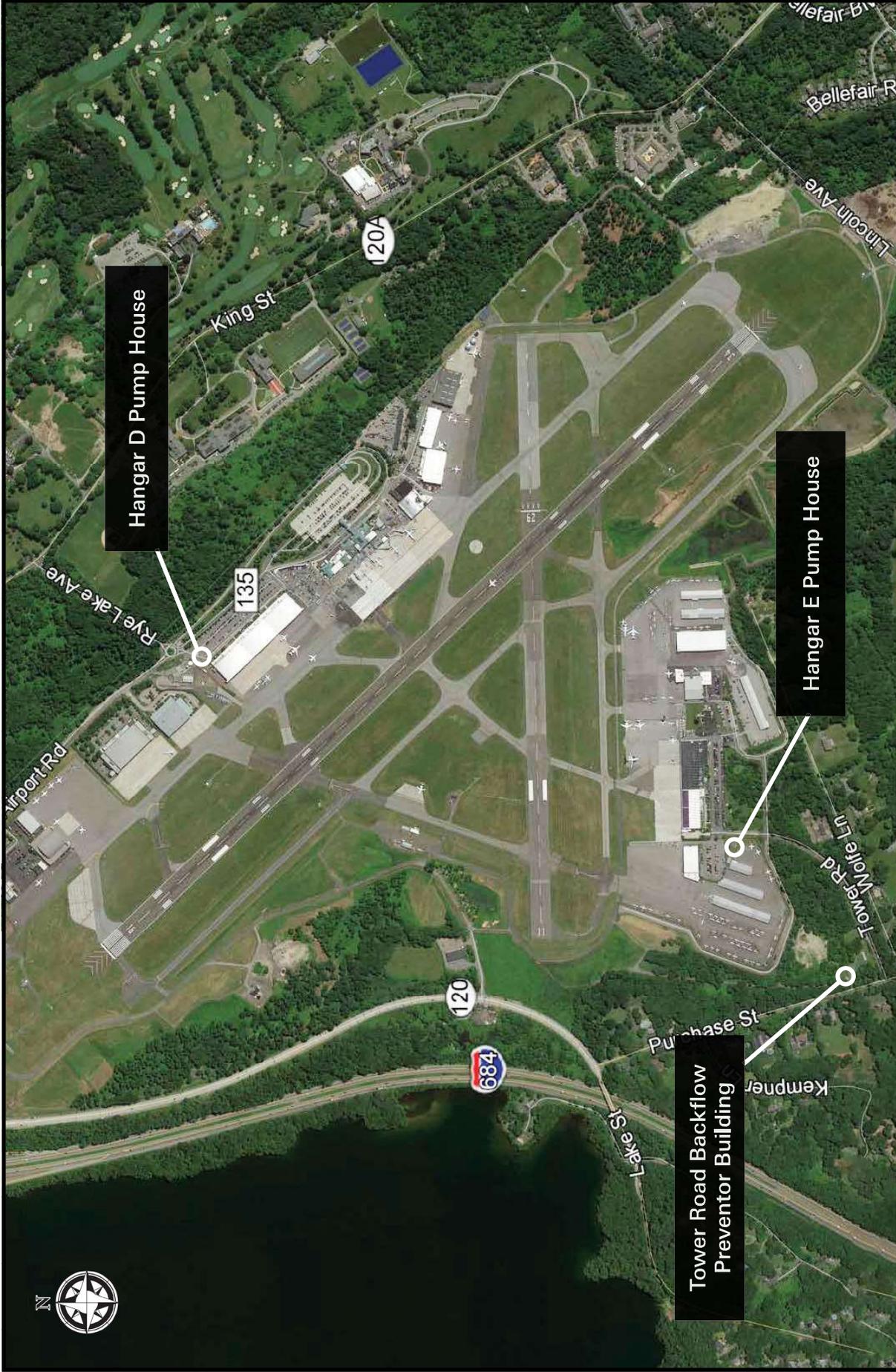


Figure 2-1
Site Location Plan

Westchester County Airport
White Plains, New York

As indicated previously, this hazardous materials assessment included the interior and exterior portions of the Hangar D Pump House, Hangar E Pump House and Tower Road Backflow Preventor Building. No other structures were included as part of this survey.

3.0 METHODOLOGY

The following provides a brief description of the methodology used in performing the hazardous materials survey for the buildings described in Section 2.0 of this report.

3.1 Asbestos-Containing Materials

An asbestos survey was performed for the buildings in order to determine the locations, quantities, friability and condition of any asbestos-containing materials (ACM) observed. The survey was performed in accordance with the asbestos bulk sampling protocols for multi-layered building systems and materials as specified in the applicable provisions of the following standards:

- New York State Department of Labor (NYSDOL) Industrial Code Rule 56 (12 NYCRR Part 56)
- United States Environmental Protection Agency (USEPA) Asbestos Hazard Emergency Response Act (AHERA) (40 CFR Part 763, Subpart E)
- USEPA Asbestos School Hazard Abatement Reauthorization Act (ASHARA) (40 CFR Part 763, Subpart E)

The purpose of the assessment was to identify whether any suspect ACM is present within the buildings and to sample and determine whether the material is ACM prior to any demolition or renovation activities. NYSDOL's Industrial Code Rule 56 (ICR 56) defines ACM as any material that contains greater than 1% asbestos by weight and requires all ACM to be removed by a licensed asbestos abatement contractor prior to building renovation or demolition. Those materials containing asbestos at concentrations less than or equal to 1% asbestos by weight are classified as non-regulated ACM.

During the assessment, all accessible portions of the buildings were visually assessed to identify any suspect ACM. All suspect ACM observed was grouped into homogenous areas for sampling (i.e., items composed of the same material with the same color and texture).

Samples were collected of each homogenous area for laboratory analysis utilizing the prescribed sample collection methodology outlined by USEPA and NYSDOL as follows: three to nine samples were collected of each surfacing material depending upon the square footage of the material present; three samples were collected of each thermal system insulation (TSI); and two to three samples were collected of each miscellaneous material depending on the square footage of the material present. The samples of each homogenous area were collected from well distributed locations of the material and all layers of the material present were collected. The samples were collected in accordance with the procedures described in the NYSDOL's ICR 56. During sample collection, the suspect ACM was physically handled to determine friability. Only observed suspect ACM was sampled during the assessment. Following collection of each sample, the inspector noted the location from where each sample was collected on a sample location plan and added the sample identification to a Chain of Custody form.

The samples were sent to the laboratory for analysis by Polarized Light Microscopy (PLM) utilizing NYSDOH ELAP Method 198.1 for friable suspect materials, and Non-Friable Organically Bound (NOB) PLM utilizing NYSDOH ELAP Method 198.6 for non-friable suspect materials. Confirmation analysis of NOB materials utilizing Transmission Electron Microscopy (TEM) was performed, where necessary, utilizing NYSDOH ELAP Method 198.4. TEM is required by the New York State Department of Health (NYSDOH) to prove that a NOB material is non-ACM, when the material is initially determined to be non-ACM by PLM and the sample has an acid insoluble inorganic phase of greater than 1.0%.

All samples were submitted to EMSL Analytical Inc. (EMSL) of Carle Place, New York for analysis. EMSL participates in the NYSDOH Environmental Laboratory Approval Program (ELAP). Copies of the laboratory's certifications are provided in Appendix C of this report.

3.2 Lead-Based Paint

A limited lead-based paint (LBP) survey was performed for the buildings in order to determine the locations, components, extent, substrate materials and condition of any LBP present. The survey was performed utilizing the applicable provisions of the USEPA and United States Department of Housing and Urban Development (HUD) standards.

According to USEPA and HUD, LBP is defined as a coating with a lead concentration greater than or equal to 0.5% or 5,000 parts per million (ppm) (also equivalent to milligrams per kilogram [mg/kg]) in a paint chip sample analyzed by a laboratory.

During the survey, accessible portions of the buildings were visually assessed to identify coated building components. The coated components were grouped by the same color, texture and substrate material. For the purposes of this assessment, the survey was performed utilizing paint chip sampling. One sample was collected of each coated building component for laboratory analysis. During sample collection, layers of the coating present were collected with the substrate material excluded. Following collection of each sample, the inspector noted the location from where each sample was collected on a sample location plan and added the sample identification to a Chain of Custody form.

The samples were sent to the laboratory for lead analysis by atomic absorption spectroscopy utilizing USEPA SW-846 Method 3050B/7000B.

All samples were submitted to EMSL Analytical Inc. (EMSL) of Carle Place, New York for analysis. EMSL participates in the NYSDOH Environmental Laboratory Approval Program (ELAP).

As indicated previously, the lead-based paint survey performed as part of this assessment was intended to determine whether lead-based paint is present within the surveyed area for waste management purposes only (only one sample was collected per coated building component). The lead-based paint survey was not performed to satisfy the requirements of a lead-based paint survey per USEPA or the United States Department of Housing and Urban Development (HUD). In addition, the lead-based paint survey was not performed to identify lead-containing materials for the purpose of complying with the United States Department of Labor Occupational Safety and Health Administration's (OSHA's) "Lead in Construction" Rule (29 CFR 1926.62).

3.3 Polychlorinated Biphenyls

Polychlorinated biphenyls (PCBs) are a group of synthetic chemical compounds known for their non-flammability, chemical stability, low volatility and electrical insulating properties. Due to these properties, PCBs were widely used in electrical, heat transfer and hydraulic equipment; as plasticizers in paints, plastics, caulks and rubber products; as pigments in dyes; as well as many other applications. PCBs were first synthesized in 1881 and, due to their toxicity and environmental persistence, their manufacture was prohibited by USEPA in 1977.

The Toxic Substances Control Act (TSCA) (40 CFR Part 761) regulates the management of PCBs at concentrations greater than or equal to 50 parts per million (ppm). Under TSCA, any equipment or material containing ≥ 50 ppm PCBs has specific handling, transportation, record keeping and disposal requirements. Electrical equipment has specific requirements depending on the type of equipment and its PCB concentration. Other equipment and materials containing ≥ 50 ppm PCBs is generally termed “PCB Bulk Product Waste.” However, if the electrical equipment or PCB Bulk Product Waste contaminates any other material via a spill, leaching, contact, etc., the impacted material is termed a “PCB Remediation Waste” and is regulated under TSCA if PCBs are detected in the material.

In New York State, the NYSDEC regulates equipment and materials containing PCBs at concentrations of greater than or equal to 50 ppm as hazardous waste. The NYSDEC’s regulations governing the identification of PCB hazardous waste are codified at 6 NYCRR Part 371.4(e), and the NYSDEC’s regulations governing the management of PCB hazardous waste are codified at 6 NYCRR Parts 372 and 373.

It should be noted that an exemption for “small capacitors” is contained in both TSCA (40 CFR 761.60(b)(2)(ii)) and the New York State hazardous waste management regulations (6 NYCRR Part 371.4(e)(1)), which is applicable to fluorescent light ballasts. All fluorescent light ballasts contain small capacitors. If manufactured prior to 1978, these small capacitors typically contain PCBs at concentrations exceeding 50 ppm. As a result, based on this exemption, the regulations allow non-leaking ballasts to be managed as municipal solid waste. However, USEPA has determined that the ballast’s potting material, the insulation that fills the space between the

ballast and the outer metal shell, also contains PCBs at concentrations that can exceed 50 ppm in pre-1978 ballasts. Therefore, USEPA recommends that either the ballast be sampled to determine that its PCB concentration is less than 50 ppm allowing it to be managed as municipal solid waste, or assume the ballast contains ≥ 50 ppm PCBs and manage the ballast as PCB Bulk Product Waste. Since sampling can be costly, often the most cost-effective option is to simply manage ballasts as PCB Bulk Product Waste.

During the survey, all PCB and suspect PCB items observed were quantified and their locations noted on a floor plan. If it was determined that the item should be sampled for PCBs, the sample was sent to EMSL Analytical Inc. (EMSL) of Cinnaminson, New Jersey for analysis utilizing USEPA SW-846 Method 8082.

3.4 Universal Waste

Due primarily to the presence of mercury and other metals in some commonplace building materials that would render them hazardous waste, the USEPA has created a category of waste referred to as “universal waste” to streamline the hazardous waste management standards and prevent generators of these materials from becoming traditional hazardous waste generators. The goal of this program is to ensure that these materials are properly managed and prevented from entering the environment without imposing the onerous requirements of the hazardous waste management regulations.

As a result, USEPA has specified, and NYSDEC has adopted, the identification of four categories of ubiquitous wastes for management as universal waste. These wastes include certain lamps (i.e., fluorescent, neon, high-intensity discharge, metal halide, sodium vapor and mercury vapor), batteries, mercury-containing equipment and certain pesticides. The regulations specifying the proper identification and management of universal waste are codified in the federal regulations at 40 CFR Part 273 and in the New York State regulations at 6 NYCRR Part 374-3.

During the survey, all universal waste observed was quantified and their locations noted. Samples were not collected of universal waste during the survey for laboratory analysis.

3.5 Refrigerant-Containing Equipment

Many different chemical compounds used as refrigerants in commercial and industrial refrigerant-containing equipment are classified as chlorofluorocarbons (CFCs). CFCs gained notoriety due their persistence in the environment coupled with their ability to efficiently destroy ozone in the upper atmosphere, which has led to the depletion of the ozone layer. As a result of the depletion of the ozone layer, USEPA established the refrigerant recycling rule under Section 608 of the Clean Air Act.

The USEPA's regulations describing the requirements for refrigerant recycling are codified at 40 CFR Part 82. These regulations require that CFCs be recovered and recycled from all equipment in which they are present during any maintenance activities and prior to any disposal activities.

In addition, USEPA has identified some refrigerants as hazardous waste in the event the refrigerants are disposed rather than recycled. The regulations specifying the proper identification and management of certain refrigerants as hazardous waste are codified in the federal regulations at 40 CFR Parts 260 through 268 and in the New York State regulations at 6 NYCRR Parts 370 through 376.

During the survey, all refrigerant-containing equipment observed was quantified and their locations noted. In addition, an attempt was made during the survey to identify the type of refrigerant present in the equipment by reading the equipment nameplate and other information provided on the equipment itself. Samples were not collected of refrigerant during the survey for laboratory analysis.

3.6 Chemical and Petroleum Products

Chemical and petroleum products have the ability to adversely impact human health and/or the environment if not properly managed. As a result, unwanted chemical and petroleum products present in containers and/or tanks should be properly managed prior to any renovation or demolition activities.

Certain chemical and petroleum products can be considered hazardous waste at the time of disposal. The regulations specifying the proper identification and management of hazardous waste are codified in the federal regulations at 40 CFR Parts 260 through 268 and in the New York State regulations at 6 NYCRR Parts 370 through 376.

Many petroleum products are considered used oil by the USEPA and NYSDEC. The regulations specifying the proper identification and management of used oil are codified in the federal regulations at 40 CFR Part 279 and in the New York State regulations at 6 NYCRR Part 374-2.

Even if a chemical or petroleum product is not identified as either hazardous waste or used oil, certain management procedures should be employed to prevent contaminating the environment or triggering a reportable quantity (RQ) under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Emergency Planning and Community Right-to-Know Act (EPCRA) or the Chemical Bulk Storage (CBS) regulations. As a result, these materials should be managed as hazardous materials and properly disposed or recycled at an appropriate off-site facility.

During the survey, the chemical and petroleum products observed were quantified and their locations noted. In addition, an attempt was made during the survey to identify the type of product present in the container by reading the label provided on the container/equipment itself. Also, if the container was observed to be leaking, the approximate area of floor impacted by the spill was noted during the survey. Samples were not collected of any chemical or petroleum product during the survey for laboratory analysis.

3.7 Miscellaneous Items, Materials and Equipment

Although not included in any of the categories identified above, some miscellaneous items, materials and equipment commonplace in construction require special handling at the time of disposal, rather than management as construction and demolition debris (C&D). These materials should be removed prior to any planned demolition activities and properly managed. Since the waste management requirements for these items will depend on the specific item,

recommendations for the proper management of these items, if identified on-site, are included in the recommendations section of this report (see Section 6.0).

During the survey, all miscellaneous items, materials and equipment observed were quantified and their locations noted. In addition, an attempt was made during the survey to identify the type of item, material or equipment observed by reading the equipment nameplate and other information provided on the equipment itself. The nameplate was also consulted to determine whether the item, material or equipment contains any chemical or any other material that may be harmful to human health or the environment. Samples were not collected of any item, material or equipment during the survey for laboratory analysis.

4.0 FINDINGS

The sections that follow present the findings of the hazardous materials survey based on the field inspection and laboratory analytical results. The limits of this survey are discussed in Section 2.0 of this report.

4.1 Asbestos-Containing Materials

A total of 20 bulk samples were collected of 10 homogeneous areas from the Hangar D Pump House, a total of 22 bulk samples were collected of 11 homogeneous areas from the Hangar E Pump House, and a total of 14 bulk samples were collected of 7 homogeneous areas from the Tower Road Backflow Preventor Building. The bulk samples were analyzed via PLM or NOB PLM for asbestos content and, if the results of the NOB PLM analysis were inconclusive, were further analyzed by TEM. Tables summarizing the asbestos bulk sample results, by building, are provided as Tables B-1A, B-1B and B-1C in Appendix B. The laboratory data packages and Chain of Custody records for the samples are provided in Appendix C. Asbestos bulk sample location plans are provided as Figures D-1 through D-3 in Appendix D.

Based on the analyses, one homogeneous area at the Hangar E Pump House was identified as ACM (i.e., the sample's analytical results indicated asbestos at a concentration above 1% by weight); none of the homogeneous areas sampled at the Hangar D Pump House and Tower Road Backflow Preventor Building were identified as ACM. In addition, the following materials not sampled due to safety/operational concerns and inaccessibility were assumed to be ACM: gaskets associated with the pumps, valves, piping and motors. ACM location plans are provided as Figures E-1, E-2 and E-3 in Appendix E. The following table summarizes the materials identified as ACM:

SUMMARY OF REGULATED ASBESTOS-CONTAINING MATERIALS			
Homogenous Area	Location	Asbestos content (%)	Approximate Quantity*
Black Tar Pipe Penetration Sealant	Hangar E Pump House - Lower Level	4.30% Chrysotile	40 SF
Gaskets	Hangar D Pump House, Hangar E Pump House and Tower Road Backflow Preventor Building	Assumed	Field Verify

* Quantities are estimated and should be verified by the contractor prior to bidding or abatement.
SF = Square feet, LF = Linear feet.

4.2 Lead-Based Paint

Paint chip samples were collected from 12 coated components from the Hangar D Pump House, 11 coated components from the Hangar E Pump House and 1 coated component from the Tower Road Backflow Preventor Building. Tables summarizing the results of the paint chip samples collected, by building, are provided as Tables B-2A, B-2B and B-2C in Appendix B. The laboratory data packages and Chain of Custody records for the samples are provided in Appendix C. Sample location plans showing the paint chip sample locations are provided as Figures D-1 through D-3 in Appendix D.

Based on the laboratory analyses, the following components were identified as coated with lead-based paint (i.e., the sample's analytical results indicated lead at a concentration greater than 0.5% by weight or 5,000 parts per million [ppm]):

SUMMARY OF LEAD-BASED PAINT				
Building Component	Location	Color	Substrate	Lead Content (ppm)
Fire Hose Valve	Hangar D Pump House, Exterior	Yellow	Metal	150,000

SUMMARY OF LEAD-BASED PAINT				
Building Component	Location	Color	Substrate	Lead Content (ppm)
Door Frame	Hangar D Pump House, Exterior Southwest Corner	Gray	Metal	74,000
12-Inch Diameter Pipe	Hangar D Pump House, 1st Floor	Yellow	Metal	46,000
Motor	Hangar D Pump House, 1st Floor	Red	Metal	29,000
12-Inch Diameter Pipe	Hangar E Pump House, Exterior	Red	Metal	8,400
6-Inch Diameter Pipe	Hangar E Pump House, Lower Level	Green	Metal	80,000
Compressor Tank	Hangar E Pump House, Lower Level	Green	Metal	110,000
Generator	Hangar E Pump House, Lower Level	Beige	Metal	55,000
Pipe	Hangar E Pump House, Lower Level	Orange	Metal	16,000
Truss	Hangar E Pump House, Lower Level	Black	Metal	34,000
Pipe	Hangar E Pump House, Lower Level	Red	Metal	160,000
Vent Pipe	Hangar E Pump House, Lower Level	Orange Over Gray	Metal	150,000
Vertical Pipe	Hangar E Pump House, Lower Level	Beige	Metal	45,000
Vertical Pipe	Hangar E Pump House, Lower Level	Yellow	Metal	110,000
Door Frame	Hangar E Pump House, Lower Level	Gray	Metal	42,000

4.3 Polychlorinated Biphenyls

Three caulks were observed on the Tower Road Backflow Preventor Building. Suspect PCB-containing materials (e.g., caulks, window glazing, etc.) were not observed on either the Hangar D Pump House or the Hangar E Pump House. In order to determine whether the Tower Road Backflow Preventor Building caulks contain PCBs at concentrations in excess of the regulatory level of 50 ppm, samples were collected for PCB analysis to ensure that the materials are properly managed, once removed. A table summarizing the PCB sample results is provided as Table B-3A in Appendix B. The laboratory data packages and Chain of Custody records for the samples are provided in Appendix C. Sample location plans are provided as Figures D-1 through D-3 in Appendix D.

Based on the laboratory analyses, PCBs were not detected in any of the samples collected from the Tower Road Backflow Preventor Building.

Based on the on-site survey, the following suspect PCB-containing items were identified at the Hangar D Pump House, Hangar E Pump House and Tower Road Backflow Preventor Building:

SUMMARY OF SUSPECT PCB-CONTAINING EQUIPMENT		
Waste Type	Location	Quantity
Ballasts	Hangar D Pump House	16
	Hangar E Pump House	18
	Tower Road Backflow Preventor Building	4

4.4 Universal Waste

Based on the on-site survey, the following universal waste was identified at the Hangar D Pump House, Hangar E Pump House and Tower Road Backflow Preventor Building:

SUMMARY OF UNIVERSAL WASTE		
Waste Type	Location	Quantity
Fluorescent Lamps	Hangar D Pump House	32
	Hangar E Pump House	36
	Tower Road Backflow Preventor Building	8

4.5 Refrigerant-Containing Equipment

Based on the on-site survey, refrigerant-containing equipment was not identified at the Hangar D Pump House, Hangar E Pump House or Tower Road Backflow Preventor Building.

4.6 Chemical and Petroleum Products

Based on the on-site survey, the following chemical and/or petroleum products were identified at the Hangar D Pump House, Hangar E Pump House and Tower Road Backflow Preventor Building:

SUMMARY OF CHEMICAL AND PETROLEUM PRODUCTS		
Description	Location	Quantity
Gloss Aerosol Spray Paint Container	Hangar D Pump House	5
2-Liter Container of Super Foam Cleanser	Hangar D Pump House	1
1-Quart Container of Valspar Paint	Hangar D Pump House	2
1-Gallon Container of Lubricating Oil	Hangar D Pump House	2
5-Gallon Container of Paint	Hangar D Pump House	2

SUMMARY OF CHEMICAL AND PETROLEUM PRODUCTS		
Description	Location	Quantity
500-Gallon Diesel Fuel Aboveground Storage Tank	Hangar E Pump House	1
Lubricating Oil Spill	Hangar E Pump House Floor	Areal Extent: Approximately 4 Feet by 5 Feet
70-Gallon Diesel Fuel Day Tank	Hangar E Pump House, Exterior, Within Generator Set, North Side of Building	1
Fire Extinguishers	Hangar D Pump House	2
	Hangar E Pump House	2

4.7 Miscellaneous Items, Materials and Equipment

Miscellaneous items, materials and/or equipment were not identified at the Hangar D Pump House, Hangar E Pump House or Tower Road Backflow Preventor Building.

5.0 CONCLUSIONS

D&B completed a hazardous materials assessment for the Hangar D Pump House, Hangar E Pump House and Tower Road Backflow Preventor Building located at Westchester County Airport at 240 Airport Road in White Plains, New York. The results of the survey are provided below.

Asbestos-Containing Materials

The results of the samples collected indicate that the following material is considered to be ACM:

- Black tar pipe penetration sealant located in the Lower Level of the Hangar E Pump House.

In addition, the following materials have been assumed to be ACM:

- Gaskets located on the equipment and piping in the Hangar D Pump House, Hangar E Pump House and Tower Road Backflow Preventor Building.

Lead-Based Paint

The results of the paint chip samples collected indicate that the following coatings are considered to be lead-based paint:

- Yellow paint located on the fire hose valve on the Hangar D Pump House exterior.
- Gray paint located on the exterior southwest corner door frame of the Hangar D Pump House.
- Yellow paint located on the 12-inch diameter pipe on the Hangar D Pump House 1st Floor.
- Red paint located on the motor on the Hangar D Pump House 1st Floor.
- Red paint located on the 12-inch diameter pipe on the Hangar E Pump House exterior.

- Green paint located on the 6-inch diameter pipe on the Hangar E Pump House Lower Level.
- Green paint located on the compressor tank on the Hangar E Pump House Lower Level.
- Beige paint located on the generator on the Hangar E Pump House Lower Level.
- Orange paint located on the metal pipe on the Hangar E Pump House Lower Level.
- Black paint located on the metal truss on the Hangar E Pump House Lower Level.
- Red paint located on the metal pipe on the Hangar E Pump House Lower Level.
- Orange over gray paint located on the vent pipe on the Hangar E Pump House Lower Level.
- Beige paint located on the vertical pipe on the Hangar E Pump House Lower Level.
- Yellow paint located on the vertical pipe on the Hangar E Pump House Lower Level.
- Gray paint located on the door frame on the Hangar E Pump House Lower Level.

Polychlorinated Biphenyls

Based on the findings of the on-site survey, the caulk samples did not contain PCBs and the following suspect PCB-containing items were observed:

- Ballasts located in the Hangar D Pump House, Hangar E Pump House and Tower Road Backflow Preventor Building.

Universal Waste

Based on the findings of the on-site survey, the following universal waste was observed:

- Fluorescent lamps located in the Hangar D Pump House, Hangar E Pump House and Tower Road Backflow Preventor Building.

Refrigerant-Containing Equipment

Refrigerant-containing equipment was not identified during the on-site survey.

Chemical and Petroleum Products

Based on the findings of the on-site survey, the following chemical and petroleum products were observed:

- Five gloss aerosol spray paint containers located in the Hangar D Pump House.
- A 2-liter container of super foam cleanser located in the Hangar D Pump House.
- Two 1-quart containers of Valspar paint located in the Hangar D Pump House.
- Two 1-gallon containers of lubricating oil located in the Hangar D Pump House.
- Two 5-gallon containers of paint located in the Hangar D Pump House.
- A 500-gallon diesel fuel aboveground storage tank located in the Hangar E Pump House.
- A lubricating oil spill measuring approximately 4 feet by 5 feet located in the Hangar E Pump House.
- A 70-gallon diesel fuel day tank located in the generator set on the exterior north side of the Hangar E Pump House.
- Fire extinguishers located in the Hangar D Pump House and Hangar E Pump House.

Miscellaneous Items, Materials and Equipment

Miscellaneous items, materials and/or equipment were not identified during the on-site survey.

6.0 RECOMMENDATIONS

The following recommendations are presented based on the conclusions of the hazardous materials assessment as presented in Section 5.0 of this report.

6.1 Asbestos-Containing Materials

Prior to performing any future demolition or renovation activities at the facility, all ACM affected by the planned activities should be removed and managed in accordance with the USEPA National Emission Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR Part 61), New York State Department of Labor (NYSDOL) Industrial Code Rule 56 (ICR 56) and any applicable local regulations. A licensed and accredited asbestos abatement contractor must be utilized to perform the removal of all ACM identified within the buildings. Any suspect ACM that was not observed and therefore not sampled during this survey should be considered ACM until sampled and proven by laboratory analysis to be non-ACM. The abatement contractor must notify the USEPA and NYSDOL of this project prior to performing any asbestos removal activities.

During performance of the asbestos removal activities, the owner must retain an independent third-party contractor to conduct project monitoring and work area air sampling and analysis to ensure that the asbestos removal work is performed in accordance with Industrial Code Rule 56 and all other applicable regulations. The owner must obtain copies of the analytical results for all air samples collected for each specific project in order to document the airborne asbestos concentrations before, during and after the asbestos abatement activities. In addition, copies of all clearance asbestos air sampling analytical results must be submitted to the NYSDOL Division of Safety & Health Asbestos Control Bureau as required by Industrial Code Rule 56.

6.2 Lead-Containing Materials

In the event that the materials identified as containing lead are demolished in the future, the demolition debris must be tested for lead, at a minimum, utilizing the Toxicity Characteristic Leaching Procedure (TCLP). If the TCLP analysis indicates lead at a concentration of 5 mg/L or greater, then the debris must be managed as a hazardous waste in accordance with the USEPA

Resource Conservation and Recovery Act (RCRA) regulations (40 CFR Parts 260 through 268) and the New York State Department of Environmental Conservation's (NYSDEC's) hazardous waste management regulations (6 NYCRR Parts 370 through 376). However, if the lead containing component is composed of metal, then the scrap metal exemption may be used and the component can be recycled in lieu of management as hazardous waste (records of the transportation and proper management of these items must be maintained in accordance with 6 NYCRR 371.1(c)(7)).

Whenever work is performed that disturbs any product/material that contains lead, workers must be protected in accordance with the United States Department of Labor Occupational Safety and Health Administration's (OSHA's) "Lead in Construction" Rule (29 CFR 1926.62). As indicated previously, the lead-based paint survey performed during this assessment was performed to only identify the presence of lead-based paint within the limits of work for waste management purposes; this survey was not performed to identify lead-containing materials for the purpose of complying with 29 CFR 1926.62.

In the event that the buildings are converted to HUD housing or a "child-occupied facility", additional requirements become applicable and must be addressed.

6.3 Polychlorinated Biphenyls

The suspect PCB items identified during this survey and described below should be properly managed as follows in the event that they are affected by any future renovation or demolition activities and will not be reused:

- **Ballasts:** Since the date the ballasts were manufactured could not be determined, the ballasts should be managed as PCB Bulk Product Waste since sampling the ballasts would be costly. PCB Bulk Product Waste should be managed at one of the following facilities:
 - An incinerator approved by USEPA in accordance with 40 CFR 761.70.
 - A chemical waste landfill approved by USEPA in accordance with 40 CFR 761.75.
 - A hazardous waste landfill approved by USEPA in accordance with 40 CFR 264 and the NYSDEC in accordance with 6 NYCRR 373.

- An alternate disposal approval in accordance with 40 CFR 761.60(e).

6.4 Universal Waste

All of the universal waste identified during this survey should be properly managed in accordance with the USEPA's universal waste management program codified at 40 CFR 273, as well as any additional requirements set forth by the NYSDEC at 6 NYCRR 374-3, in the event that it is affected by any future renovation or demolition activities and will not be reused.

6.5 Chemical and Petroleum Products

All of the chemical and petroleum products identified during this survey should be properly managed in the event that they are affected by any future renovation or demolition activities and will not be reused. The first step in disposal is to perform a waste determination on each product in accordance with 40 CFR 261 and 6 NYCRR 371. If a Safety Data Sheet (SDS) cannot be located for the product, a sample of the material should be collected and analyzed for flash point, pH, reactive sulfide, reactive cyanide and RCRA constituents by the Toxicity Characteristic Leaching Procedure (TCLP), as well as any additional parameters specified by the selected disposal facility. If determined to be hazardous waste, the waste should be managed at a facility authorized to manage hazardous waste in accordance with 40 CFR 264 and 6 NYCRR 373. If determined to be nonhazardous waste, the waste should be managed as nonhazardous waste at a facility approved to manage such waste.

APPENDIX A

ASBESTOS LICENSES

New York State – Department of Labor

Division of Safety and Health
License and Certificate Unit
State Campus, Building 12
Albany, NY 12240

ASBESTOS HANDLING LICENSE

D & B Engineers and Architects, P.C. (dba)Dvirka and
Bartilucci Consulting Engineers)

330 Crossways Park Drive

Woodbury, NY 11797

FILE NUMBER: 07-0207

LICENSE NUMBER: 28587

LICENSE CLASS: RESTRICTED

DATE OF ISSUE: 08/08/2019

EXPIRATION DATE: 08/31/2020

Duly Authorized Representative – Richard M Walka:

This license has been issued in accordance with applicable provisions of Article 30 of the Labor Law of New York State and of the New York State Codes, Rules and Regulations (12 NYCRR Part 56). It is subject to suspension or revocation for a (1) serious violation of state, federal or local laws with regard to the conduct of an asbestos project, or (2) demonstrated lack of responsibility in the conduct of any job involving asbestos or asbestos material.

This license is valid only for the contractor named above and this license or a photocopy must be prominently displayed at the asbestos project worksite. This license verifies that all persons employed by the licensee on an asbestos project in New York State have been issued an Asbestos Certificate, appropriate for the type of work they perform, by the New York State Department of Labor.



Eileen M. Franko, Director
For the Commissioner of Labor



D&B ENGINEERS
AND
ARCHITECTS, P.C.

P. KUMAR CHAKRABORTY

New York State Department of Labor (NYSDOL)

Certificate # 96-02121

Expiration Date: 07/20



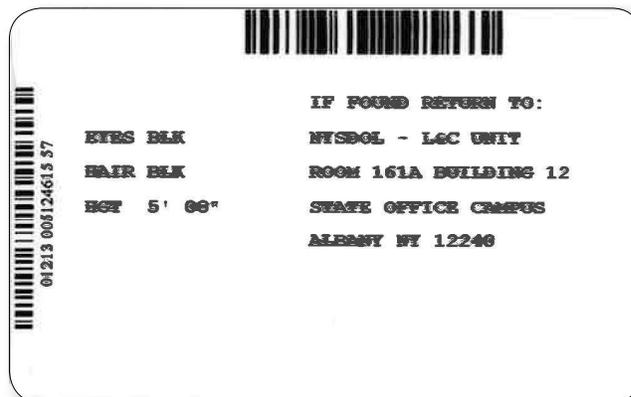
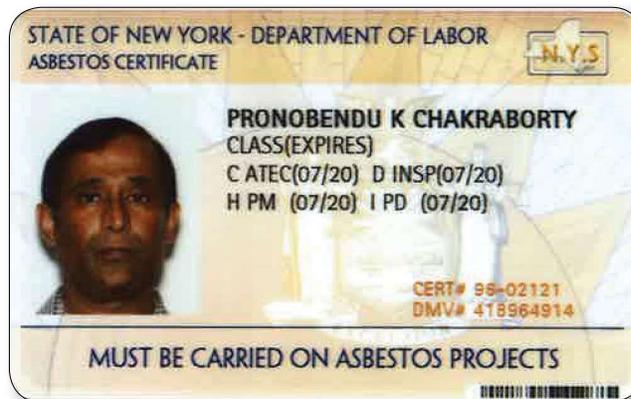
New York State Department of Labor (NYSDOL) - Licenses

Project Designer

Inspector

Project Monitor

Air Sampling Technician





D&B ENGINEERS
AND
ARCHITECTS, P.C.

ALEXANDER C. PUGLIESE

New York State Department of Labor (NYSDOL)

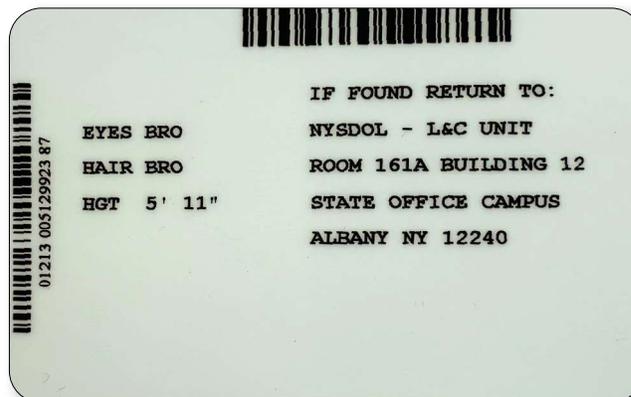
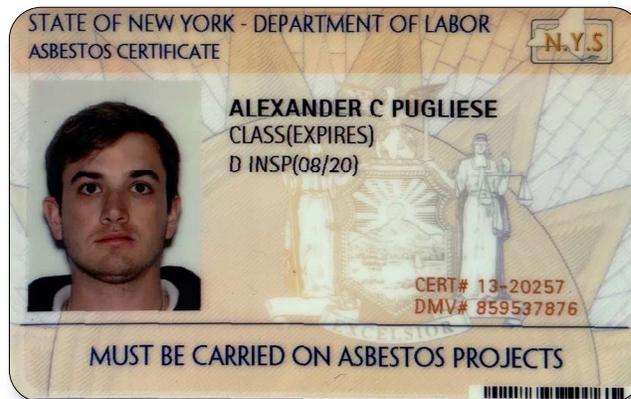
Certificate # 13-20257

Expiration Date: 08/20



New York State Department of Labor (NYSDOL) - Licenses

Inspector



APPENDIX B

SAMPLE SUMMARY TABLES

**TABLE B-1A
WESTCHESTER COUNTY
WESTCHESTER COUNTY AIRPORT
HANGAR D PUMP HOUSE
WHITE PLAINS, NEW YORK
ASBESTOS BULK SAMPLE RESULTS**

Sample ID	Material Description	Sample Location			Sample Information			Sample Result	
		Floor	Area	Interior/ Exterior	Friable/ Non-Friable	Condition	Date Sample Collected	PLM or PLM-NOB	TEM-NOB
KC-ACM-RF-01-01	Roof Flashing Tar	Roof	Beneath Parapet Wall - East Side	Exterior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND
KC-ACM-RF-01-02	Roof Flashing Tar	Roof	Beneath Parapet Wall - East Side	Exterior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND
KC-ACM-RM-02-01	Roof Membrane - Bottom Layer	Roof	Roof - North Side	Exterior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND
KC-ACM-RM-02-02	Roof Membrane - Bottom Layer	Roof	Roof - East Side	Exterior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND
KC-ACM-RM-03-01	Roof Membrane - Top Layer	Roof	Roof - Northeast Side	Exterior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND
KC-ACM-RM-03-02	Roof Membrane - Top Layer	Roof	Roof - East Side	Exterior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND
KC-ACM-FT-04-01	Foundation Tar	-	Northeast Corner	Exterior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND
KC-ACM-FT-04-02	Foundation Tar	-	East Side	Exterior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND
KC-ACM-BM-05-01	Brick Mortar	-	Northeast Side	Exterior	Friable	Damaged	Jun-18-2020	ND	NA
KC-ACM-BM-05-02	Brick Mortar	-	Southwest Side	Exterior	Friable	Damaged	Jun-18-2020	ND	NA

TABLE B-1A
WESTCHESTER COUNTY
WESTCHESTER COUNTY AIRPORT
HANGAR D PUMP HOUSE
WHITE PLAINS, NEW YORK
ASBESTOS BULK SAMPLE RESULTS

Sample ID	Material Description	Sample Location			Sample Information			Sample Result	
		Floor	Area	Interior/ Exterior	Friable/ Non-Friable	Condition	Date Sample Collected	PLM or PLM-NOB	TEM-NOB
KC-ACM-CM-06-01	Cementitious Window Mortar	-	Glass Window - South Side	Exterior	Friable	Damaged	Jun-18-2020	ND	NA
KC-ACM-CM-06-02	Cementitious Window Mortar	-	Glass Window - South Side	Exterior	Friable	Damaged	Jun-18-2020	ND	NA
KC-ACM-TCT-07-01	Tar Sealant	1st	Comp. Tank #1	Interior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND
KC-ACM-TCT-07-02	Tar Sealant	1st	Comp. Tank #3	Interior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND
KC-ACM-PPST-08-01	Black Tar on Pipe Penetration Sealant	1st	Tank #1	Interior	Non-Friable	Damaged	Jun-18-2020	Inconclusive: < 1% Chrysotile	ND
KC-ACM-PPST-08-02	Black Tar on Pipe Penetration Sealant	1st	Tank #2	Interior	Non-Friable	Damaged	Jun-18-2020	Inconclusive: < 1% Chrysotile	ND
KC-ACM-CPPS-09-01	Cementitious Pipe Penetration Sealant	1st	South Side	Interior	Friable	Damaged	Jun-18-2020	ND	NA
KC-ACM-CPPS-09-02	Cementitious Pipe Penetration Sealant	1st	South Side	Interior	Friable	Damaged	Jun-18-2020	ND	NA
KC-ACM-PG-10-01	Pipe Gasket	1st	Pipe within Building	Interior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND
KC-ACM-PG-10-02	Pipe Gasket	1st	Pipe within Building	Interior	Non-Friable	Damaged	Jun-18-2020	Inconclusive	ND

Notes:
ND: Asbestos not detected
PLM: Polarized light microscopy
NA/PS: Not analyzed. Analysis stopped after first positive result.
NA: Not analyzed.
TEM: Transmission electron microscopy
Asbestos Containing Materials are bold and highlighted in orange.

**TABLE B-1B
WESTCHESTER COUNTY
WESTCHESTER COUNTY AIRPORT
HANGAR E PUMP HOUSE
WHITE PLAINS, NEW YORK
ASBESTOS BULK SAMPLE RESULTS**

Sample ID	Material Description	Sample Location			Sample Information			Sample Result	
		Floor	Area	Interior/ Exterior	Friable/ Non-Friable	Condition	Date Sample Collected	PLM or PLM-NOB	TEM-NOB
KC-ACM-FT-01-01	Roof Flashing Tar	Roof	Beneath Metal - West Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-FT-01-02	Roof Flashing Tar	Roof	Beneath Metal - Northwest Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-TAR-02-01	Tar Under Metal Door Joint	-	Northeast Side of Siding	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-TAR-02-02	Tar Under Metal Door Joint	-	West Side of Siding	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-RM-03-01	Entrance Door Roof Tar	Roof	Roof - South Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-RM-03-02	Entrance Door Roof Tar	Roof	Roof - North Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-CM-04-01	Cementitious Material on Deck	Roof	Beneath Roofing Materials - South Side	Exterior	Friable	Damaged	Jun-17-2020	ND	NA
KC-ACM-CM-04-02	Cementitious Material on Deck	Roof	Beneath Roofing Materials - North Side	Exterior	Friable	Damaged	Jun-17-2020	ND	NA
KC-ACM-RFP-05-01	Felt Paper	Roof	Beneath Block on Roof - South Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-RFP-05-02	Felt Paper	Roof	Beneath Block on Roof - Southeast Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND

**TABLE B-1B
WESTCHESTER COUNTY
WESTCHESTER COUNTY AIRPORT
HANGAR E PUMP HOUSE
WHITE PLAINS, NEW YORK
ASBESTOS BULK SAMPLE RESULTS**

Sample ID	Material Description	Sample Location			Sample Information			Sample Result	
		Floor	Area	Interior/ Exterior	Friable/ Non-Friable	Condition	Date Sample Collected	PLM or PLM-NOB	TEM-NOB
KC-ACM-RM-06-01	Roof Tar under Foam Insulation	Roof	Roof - South Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-RM-06-02	Roof Tar under Foam Insulation	Roof	Roof - Southeast Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-BM-07-01	Brick Mortar	-	East Corner	Exterior	Friable	Damaged	Jun-17-2020	ND	NA
KC-ACM-BM-07-02	Brick Mortar	-	South Corner	Exterior	Friable	Damaged	Jun-17-2020	ND	NA
KC-ACM-RVT-08-01	Roof Vent Tar	Roof	Large Hatch Door	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-RVT-08-02	Roof Vent Tar	Roof	Sister Hatch Door	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-PPS-09-01	Black Tar Pipe Penetration Sealant	Lower Level	Within Lower Level	Interior	Non-Friable	Damaged	Jun-17-2020	4.30% Chrysotile	NA
KC-ACM-PPS-09-02	Black Tar Pipe Penetration Sealant	Lower Level	Within Lower Level	Interior	Non-Friable	Damaged	Jun-17-2020	PS/NA	NA
KC-ACM-PPC-10-01	Pipe Penetration Cement	Lower Level	Lower Level Pipe	Interior	Friable	Damaged	Jun-17-2020	ND	NA
KC-ACM-PPC-10-02	Pipe Penetration Cement	Lower Level	Lower Level Pipe	Interior	Friable	Damaged	Jun-17-2020	ND	NA

TABLE B-1B
 WESTCHESTER COUNTY
 WESTCHESTER COUNTY AIRPORT
 HANGAR E PUMP HOUSE
 WHITE PLAINS, NEW YORK
 ASBESTOS BULK SAMPLE RESULTS

Sample ID	Material Description	Sample Location			Sample Information			Sample Result	
		Floor	Area	Interior/ Exterior	Friable/ Non-Friable	Condition	Date Sample Collected	PLM or PLM-NOB	TEM-NOB
KC-ACM-FLT-11-01	Felt Paper	-	Felt Paper beneath Metal Siding	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-FLT-11-02	Felt Paper	-	Felt Paper beneath Metal Siding	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND

Notes:

ND: Asbestos not detected

PLM: Polarized light microscopy

NA/PS: Not analyzed. Analysis stopped after first positive result.

NA: Not analyzed.

TEM: Transmission electron microscopy

Asbestos Containing Materials are bold and highlighted in orange.

TABLE B-1C
 WESTCHESTER COUNTY
 WESTCHESTER COUNTY AIRPORT
 TOWER ROAD BACKFLOW PREVENTOR BUILDING
 WHITE PLAINS, NEW YORK
 ASBESTOS BULK SAMPLE RESULTS

Sample ID	Material Description	Sample Location			Sample Information			Sample Result	
		Floor	Area	Interior/ Exterior	Friable/ Non-Friable	Condition	Date Sample Collected	PLM or PLM-NOB	TEM-NOB
KC-ACM-TLCR-01-01	Roof Tar	Roof	Tar Layer on Concrete Roof - West Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-TLCR-01-02	Roof Tar	Roof	Tar Layer on Concrete Roof - East Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-TJOR-02-01	Tar Joint on Concrete Roof	Roof	Tar Roof Joint - West Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-TJOR-02-02	Tar Joint on Concrete Roof	Roof	Tar Roof Joint - East Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-CAU-03-01	Caulk on Slab Joint	-	Slab Joint on Siding - North Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-CAU-03-02	Caulk on Slab Joint	-	Slab Joint on Siding - South Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-PPS-04-01	Cementitious Pipe Penetration Sealant	1st	Interior Vertical Pipe	Interior	Friable	Damaged	Jun-17-2020	ND	NA
KC-ACM-PPS-04-02	Cementitious Pipe Penetration Sealant	1st	Interior Vertical Pipe	Interior	Friable	Damaged	Jun-17-2020	ND	NA
KC-ACM-TAR-05-01	Interior Tar Joint	1st	Tar Joint on Ceiling Slab	Interior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-TAR-05-02	Interior Tar Joint	1st	Tar Joint on Ceiling Slab	Interior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND

TABLE B-1C
 WESTCHESTER COUNTY
 WESTCHESTER COUNTY AIRPORT
 TOWER ROAD BACKFLOW PREVENTOR BUILDING
 WHITE PLAINS, NEW YORK
 ASBESTOS BULK SAMPLE RESULTS

Sample ID	Material Description	Sample Location			Sample Information			Sample Result	
		Floor	Area	Interior/ Exterior	Friable/ Non-Friable	Condition	Date Sample Collected	PLM or PLM-NOB	TEM-NOB
KC-ACM-VC-06-01	Vent Caulk	-	Exterior Vent - West Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-VC-06-02	Vent Caulk	-	Exterior Vent - East Side	Exterior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-CAU-07-01	Joint Caulk	1st	Interior Corner Joint	Interior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND
KC-ACM-CAU-07-02	Joint Caulk	1st	Interior Corner Joint	Interior	Non-Friable	Damaged	Jun-17-2020	Inconclusive	ND

Notes:

ND: Asbestos not detected

PLM: Polarized light microscopy

NA/PS: Not analyzed. Analysis stopped after first positive result.

NA: Not analyzed.

TEM: Transmission electron microscopy

Asbestos Containing Materials are bold and highlighted in orange.

**TABLE B-2A
WESTCHESTER COUNTY
WESTCHESTER COUNTY AIRPORT
HANGAR D PUMP HOUSE
WHITE PLAINS, NEW YORK
LEAD-BASED PAINT SAMPLE RESULTS**

Sample ID	Location	Floor	Color	Interior/ Exterior	Condition	Substrate Material	Date Sample Collected	Lead Concentration (ppm)
KC-LBP-01	Fire Hose Valve	--	Yellow	Exterior	Poor	Metal	Jun-18-2020	150,000
KC-LBP-02	Door Frame - Southwest Corner	--	Gray	Exterior	Poor	Metal	Jun-18-2020	74,000
KC-LBP-03	Roller Door Frame	--	Black	Exterior	Poor	Metal	Jun-18-2020	1,900
KC-LBP-04	Brick Wall	--	White over Green	Exterior	Poor	Brick	Jun-18-2020	<80
KC-LBP-05	12-Inch Diameter Pipe	1st	Orange	Interior	Poor	Metal	Jun-18-2020	260
KC-LBP-06	12-Inch Diameter Pipe	1st	Yellow	Interior	Poor	Metal	Jun-18-2020	46,000
KC-LBP-07	Foundation Wall - North Side	1st	Brown	Interior	Poor	Concrete	Jun-18-2020	2,100
KC-LBP-08	Concrete Pad	1st	Gray	Interior	Poor	Concrete	Jun-18-2020	3,000
KC-LBP-09	6-Inch Diameter Pipe	1st	Green	Interior	Poor	Metal	Jun-18-2020	240
KC-LBP-10	Motor	1st	Red	Interior	Poor	Metal	Jun-18-2020	29,000

TABLE B-2A
WESTCHESTER COUNTY
WESTCHESTER COUNTY AIRPORT
HANGAR D PUMP HOUSE
WHITE PLAINS, NEW YORK
LEAD-BASED PAINT SAMPLE RESULTS

Sample ID	Location	Floor	Color	Interior/ Exterior	Condition	Substrate Material	Date Sample Collected	Lead Concentration (ppm)
KC-LBP-11	Foam Tank	1st	Red	Interior	Poor	Metal	Jun-18-2020	<80
KC-LBP-12	Ceiling Truss	1st	Black	interior	Poor	Metal	Jun-18-2020	270

Notes:

Lead-based paint is defined as a coating with a lead concentration greater than or equal to 0.5% by weight or 5,000 parts per million (ppm).
Lead-based paint highlighted in green.

TABLE B-2B
WESTCHESTER COUNTY
WESTCHESTER COUNTY AIRPORT
HANGAR E PUMP HOUSE
WHITE PLAINS, NEW YORK
LEAD-BASED PAINT SAMPLE RESULTS

Sample ID	Location	Floor	Color	Interior/ Exterior	Condition	Substrate Material	Date Sample Collected	Lead Concentration (ppm)
KC-LBP-01	12-Inch Diameter Pipe	--	Red	Exterior	Poor	Metal	Jun-17-2020	8,400
KC-LBP-02	6-Inch Diameter Pipe	Lower Level	Green	Interior	Poor	Metal	Jun-17-2020	80,000
KC-LBP-03	Compressor Tank	Lower Level	Green	Interior	Poor	Metal	Jun-17-2020	110,000
KC-LBP-04	Generator	Lower Level	Beige	Interior	Poor	Metal	Jun-17-2020	55,000
KC-LBP-05	Metal Pipe	Lower Level	Orange	Interior	Poor	Metal	Jun-17-2020	16,000
KC-LBP-06	Metal Truss	Lower Level	Black	Interior	Poor	Metal	Jun-17-2020	34,000
KC-LBP-07	Metal Pipe	Lower Level	Red	Interior	Poor	Metal	Jun-17-2020	160,000
KC-LBP-08	Vent Pipe	Lower Level	Orange Over Gray	Interior	Poor	Metal	Jun-17-2020	150,000
KC-LBP-09	Vertical Pipe	Lower Level	Beige	Interior	Poor	Metal	Jun-17-2020	45,000
KC-LBP-10	Vertical Pipe	Lower Level	Yellow	Interior	Poor	Metal	Jun-17-2020	110,000

TABLE B-2B
WESTCHESTER COUNTY
WESTCHESTER COUNTY AIRPORT
HANGAR E PUMP HOUSE
WHITE PLAINS, NEW YORK
LEAD-BASED PAINT SAMPLE RESULTS

Sample ID	Location	Floor	Color	Interior/ Exterior	Condition	Substrate Material	Date Sample Collected	Lead Concentration (ppm)
KC-LBP-11	Door Frame	Lower Level	Gray	Interior	Poor	Metal	Jun-17-2020	42,000

Notes:

Lead-based paint is defined as a coating with a lead concentration greater than or equal to 0.5% by weight or 5,000 parts per million (ppm).
Lead-based paint highlighted in green.

TABLE B-2C
WESTCHESTER COUNTY
WESTCHESTER COUNTY AIRPORT
TOWER ROAD BACKFLOW PREVENTOR BUILDING
WHITE PLAINS, NEW YORK
LEAD-BASED PAINT SAMPLE RESULTS

Sample ID	Location	Floor	Color	Interior/ Exterior	Condition	Substrate Material	Date Sample Collected	Lead Concentration (% wt.)
KC-LBP-01	12-Inch Diameter Pipe	1st	Gray	Interior	Poor	Metal	Jun-17-2020	<0.028

Notes:

Lead-based paint is defined as a coating with a lead concentration greater than or equal to 0.5% by weight or 5,000 parts per million (ppm).
Lead-based paint highlighted in green.

TABLE B-3A
WESTCHESTER COUNTY
WESTCHESTER COUNTY AIRPORT
TOWER ROAD BACKFLOW PREVENTOR BUILDING
WHITE PLAINS, NEW YORK
POLYCHLORINATED BIPHENYL SAMPLE RESULTS

Sample ID	Materials Description	Location	Floor	Interior/ Exterior	Condition	Date Sample Collected	Total PCB Concentration (ppm)
KC-PCB-CAU-01	Exterior Caulk on Joint	Slab Joint - North Side	--	Exterior	Damaged	Jun-17-2020	ND
KC-PCB-CAU-02	Vent Caulk	Exterior Vent Caulk	--	Exterior	Damaged	Jun-17-2020	ND
KC-PCB-CAU-03	White Joint Caulk	Interior White Joint Caulk	1st	Interior	Damaged	Jun-17-2020	ND

Notes:

ppm: parts per million

ND: Not detected

Materials highlighted in blue exceed the NYSDEC guidance value of 50 parts per million

APPENDIX C

LABORATORY RESULTS, CHAIN OF CUSTODY RECORDS AND LABORATORY CERTIFICATIONS



EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514
Tel/Fax: (516) 997-7251 / (516) 997-7528
<http://www.EMSL.com / carleplacelab@emsl.com>

EMSL Order: 062010184
Customer ID: DVBI69
Customer PO:
Project ID:

Attention: Mike Hofgren
D&B Engineers and Architects, P.C.
330 Crossway Park Drive
Woodbury, NY 11797

Phone: (516) 364-9890
Fax: (516) 364-9045
Received Date: 06/19/2020 2:10 PM
Analysis Date: 06/26/2020
Collected Date: 06/18/2020

Project: WC-DPW, Westchester County Airport, #:5468-01

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID KC-ACM-RF-1-01 062010184-0001			Description Roof - Flashing - Under Parapet - East - Roof Flashing Tar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-RF-1-02 062010184-0002			Description Roof - Flashing - Parapet Wall - West Side - Roof Flashing Tar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-RM-2-01 062010184-0003			Description Roof - North Side - Roof Membrane - Bottom Layer		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black	<1.00% Glass	100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-RM-2-02 062010184-0004			Description Roof - East Side - Roof Membrane - Bottom Layer		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black	<1.00% Glass	100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-RM-3-01 062010184-0005			Description Roof - NE Side - Roof Membrane - Top Layer		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected

Initial report from: 06/26/2020 14:48:59



EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514
Tel/Fax: (516) 997-7251 / (516) 997-7528
<http://www.EMSL.com> / carleplacelab@emsl.com

EMSL Order: 062010184
Customer ID: DVBI69
Customer PO:
Project ID:

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID KC-ACM-RM-3-02 062010184-0006			Description Roof - NE Side - Roof Membrane - Top Layer		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-FT-4-01 062010184-0007			Description Exterior - NE Corner - Foundation Tar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-FT-4-02 062010184-0008			Description Exterior - East Side - Foundation Tar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-BM-5-01 062010184-0009			Description Exterior - NE Side - Brick Mortar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable	06/26/2020	Gray	2.00% Cellulose 2.00% Glass	33.00% Ca Carbonate 2.00% Mica 5.00% Non-fibrous (other) 56.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-BM-5-02 062010184-0010			Description Exterior - South West - Brick Mortar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable	06/26/2020	Gray	2.00% Cellulose 2.00% Glass	34.00% Ca Carbonate 2.00% Mica 60.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-GM-6-01 062010184-0011			Description Exterior - South Side - Glass Window - Cementitious Window Mortar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable	06/26/2020	White	2.00% Cellulose	65.00% Ca Carbonate 8.00% Non-fibrous (other) 25.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed

Initial report from: 06/26/2020 14:48:59



EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514
Tel/Fax: (516) 997-7251 / (516) 997-7528
<http://www.EMSL.com> / carleplacelab@emsl.com

EMSL Order: 062010184
Customer ID: DVBI69
Customer PO:
Project ID:

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID KC-ACM-GM-6-02 062010184-0012		Description	Exterior - South Side - Glass Window - Cementitious Window Mortar		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	06/26/2020	White	2.00% Cellulose	60.00% Ca Carbonate 11.00% Non-fibrous (other) 27.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-TCT-7-01 062010184-0013		Description	Interior - Comp. Tank #1 - Tar Sealant (Black)		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black/ Silver		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black/ Silver		100.00% Other	None Detected
Sample ID KC-ACM-TCT-7-02 062010184-0014		Description	Interior - Comp. Tank #3 - Tar Sealant (Black)		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black/ Silver		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black/ Silver		100.00% Other	None Detected
Sample ID KC-ACM-PPST-8-01 062010184-0015		Description	Interior - Tank #1 - Black Tar on Pipe Penetration Sealant		
		Homogeneity	Heterogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Various/ Black	None	100.00% Other	Inconclusive : <1% Chrysotile
TEM NYS 198.4 NOB	06/26/2020	Various/ Black		100.00% Other	None Detected
Sample ID KC-ACM-PPST-8-02 062010184-0016		Description	Interior - Tank #2 - Black Tar on Pipe Penetration Sealant		
		Homogeneity	Heterogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Various/ Black	None	100.00% Other	Inconclusive : <1% Chrysotile
TEM NYS 198.4 NOB	06/26/2020	Various/ Black		100.00% Other	None Detected
Sample ID KC-ACM-CPPS-9-01 062010184-0017		Description	Interior - South Side - Cementitious Pipe Penetration Sealant		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	06/26/2020	Gray	2.00% Cellulose 2.00% Glass	30.00% Ca Carbonate 1.00% Non-fibrous (other) 65.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed

Initial report from: 06/26/2020 14:48:59



EMSL Analytical, Inc.

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<http://www.EMSL.com> / carleplacelab@emsl.com

EMSL Order: 062010184
Customer ID: DVBI69
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID KC-ACM-CPPS-9-02 062010184-0018		Description	Interior - South Side - Cementitious Pipe Penetration Sealant		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	06/26/2020	Gray	2.00% Cellulose 1.00% Glass	38.00% Ca Carbonate 1.00% Non-fibrous (other) 58.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-PG-10-01 062010184-0019		Description	Interior - On Pipe - Pipe Gasket		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-PG-10-02 062010184-0020		Description	Interior - On Pipe - Pipe Gasket		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected

Initial report from: 06/26/2020 14:48:59



EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514
Tel/Fax: (516) 997-7251 / (516) 997-7528
<http://www.EMSL.com> / carleplacelab@emsl.com

EMSL Order: 062010184
Customer ID: DVBI69
Customer PO:
Project ID:

Test Report:Asbestos Analysis of Bulk Material

The samples in this report were submitted to EMSL for analysis by Asbestos Analysis of Bulk Materials via NYS ELAP Approved Methods. The reference number for these samples is the EMSL Order ID above. Please use this reference number when calling about these samples.

Report Comments:

Sample Receipt Date: 6/19/2020
Analysis Completed Date: 6/26/2020

Sample Receipt Time: 2:10 PM
Analysis Completed Time: 10:45 AM

Analyst(s):

Omatie Ramrattan-Scarallo

Omatie Ramrattan-Scarallo PLM NYS 198.1 Friable (6)

Jackson Li TEM NYS 198.4 NOB (14)

Omatie Ramrattan-Scarallo

Omatie Ramrattan-Scarallo PLM NYS 198.6 NOB (14)

Samples reviewed and approved by:

Daniel Clarke, Asbestos Laboratory Manager
or Other Approved Signatory

NOB = Non Friable Organically Bound N/A = Not Applicable VCM = Vermiculite Containing Material

-In New York State, TEM is currently the only method that can be used to determine if NOB materials can be considered or treated as non-asbestos containing.

All samples examined for the presence of vermiculite when analyzed via NYS 198.1.

-NYS Guidelines for Vermiculite containing samples are available at http://www.wadsworth.org/labcert/elapcert/forms/VermiculiteInterimGuidance_Rev070913.pdf EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples were received in good condition unless otherwise noted.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. This report may contain data that is not covered by the NVLAP accreditation.

Samples analyzed by EMSL Analytical, Inc. Carle Place, NY NYS ELAP 11469

Initial report from: 06/26/2020 14:48:59

ASBESTOS BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

D&B ENG AND ARCHITECT

Client Name: WC-DPW
 Project Name and Address: Westchester County Airport

Inspector/Investigator: Kumar Chakraborty
 Project Manager: MH

Date: 6/18/2020
 Requested Turnaround Time: 24 Hour 6 Hour 72 Hour 48 Hour

Project Number: 5468-01
 Page: 1 of 2

BULK SAMPLE INFORMATION						
Bulk Sample ID No.	Material Description	Floor ID	Room/Area Description	Condition / Friability	Photo ID/ Time	
KC-ACM-RF-1-01-02	Roof Flushing Tar	Roof	Roof Flushing Tar under parapet	-Est	P/NF	
KC-ACM-RM-2-01-02	"	"	" West side parapet w/dly	P/NF		
KC-ACM-RM-2-01-02	Roof Membrane - Bottom layer		Northside of roof			
KC-ACM-RM-3-01-02	"		East side of roof			
KC-ACM-FT-4-01-02	Roof Membrane - Top layer		Top layer - NE side			
KC-ACM-BM-5-01-02	"	Ext.	" - East side			
KC-ACM-BM-5-01-02	Foundation Tar		NE Corner			
KC-ACM-BM-5-01-02	"		East side			
KC-ACM-BM-5-01-02	Brick Mortar		Exterior brick mortar - NE side			
KC-ACM-BM-5-01-02	"		" South west			

Special Instruction to Laboratory:
 Analyze All Samples Stop at First Positive in Each Homogeneous Group Perform TEM-NOB Analysis if Necessary
 Email Results to: kchakraborty@db-eng.com

CHAIN OF CUSTODY INFORMATION AND LABORATORY INFORMATION

Relinquished By:	Date	Time	Received By:	Date	Time	Method Of Submittal
I. (Print): K. CHAKRABORTY	6/18/2020		W. CHAKRABORTY	6/18/2020	2:10 PM	Walk in
(Sign):						
II. (Print):						Fed-Ex
(Sign):						Others
III. (Print):						Fed-Ex
(Sign):						Others

Lab Comments:

RECEIVED
 ANALYTICAL INC.
 CARLE PLACE, NY
 20 JUN 19 PM 2:10

062010184



ASBESTOS BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

Client Name: WC- DPW
Project Name and Address: Westchester County Airport - Hangar D
Inspector/Investigator: Kumar Chakraborty
Page: 2 of 2
Date: 6-18-2020
Requested Turnaround Time: 2 Hour 6 Hour 24 Hour 48 Hour 72 Hour Other 1 Week
Project Manager: MH
Project Number: 5468-01

BULK SAMPLE INFORMATION

Bulk Sample ID No.	Material Description	Floor ID	Room/Area Description	Condition / Friability	Photo ID/Time
KC-ACM-GM-6-01-02	Cementitious Window Mortar	Ext.	Southside Glass Window	OP/NF	
KC-ACM-TCT-7-01	Tar sealant on (black)	Int.	Comp Tank # 1		
KC-ACM-PPST-8-01	Black Tar on pipe penetration Sealant	Int.	Comp Tank # 3		
KC-ACM-CPPS-9-01	Cementation Pipe Penetration Sealant	↓	Interior Tank # 1		
	" "	Int.	" " # 2		
	" "	Int.	Southside		
KC-ACM-PG-10-01	Pipe Gasket	Ext.	Hot Pipe Gasket on chimney		
4 + -02	" "	" "	" " Pipe		

Condition: G - Good, D - Damage, SD - Significant Damage
Friability: F - Friable, NF - Not Friable
Special Instruction to Laboratory: Analyze All Samples Stop at First Positive in Each Homogeneous Group Perform TEM-NOB Analysis if Necessary
Email Results to: kchakraborty@db-eng.com

CHAIN OF CUSTODY INFORMATION AND LABORATORY INFORMATION

Relinquished By:	Date	Received By:	Date	Time	Method Of Submittal
I. (Print): P.K. CHAKRABORTY	6-18/2020	M. DUBOIS	6/19/20	2:10 PM	Field
(Sign):					Walk In
II. (Print):					Fed-Ex
(Sign):					Others
III. (Print):					Fed-Ex
(Sign):					Others
D&B Comments: Lab Comments:					
Analyzed By: _____ Date & Time: _____					
Print Name: _____ Sign: _____					

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062010184



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528 Mineola Avenue Carle Place, NY 11514
Tel/Fax: (516) 997-7251 / (516) 997-7528
<http://www.EMSL.com / carleplacelab@emsl.com>

EMSL Order: 062010086
Customer ID: DVBI69
Customer PO:
Project ID:

Attention: Mike Hofgren
D&B Engineers and Architects, P.C.
330 Crossway Park Drive
Woodbury, NY 11797

Phone: (516) 364-9890
Fax: (516) 364-9045
Received Date: 06/19/2020 2:11 PM
Analysis Date: 06/25/2020 - 06/26/2020
Collected Date: 06/17/2020

Project: WCA DPW, Westchester County Airport, Hanger E, #:5468-01

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID KC-ACM-FT-1-01 062010086-0001			Description Roof, West Side - Flashing Tar - Under Metal		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-FT-1-02 062010086-0002			Description Roof, NW Side - Flushing Tar - Under Metal		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-TAR-2-01 062010086-0003			Description Exterior, Northwest Side of Siding - Tar - Under Metal Door Joint Siding		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-TAR-2-02 062010086-0004			Description Exterior, West Side of Siding - Tar - Under Metal Door Joint Siding		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-RM-3-01 062010086-0005			Description Roof, South Side Roof, Entrance Door - Roof Tar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black/ Silver	<1.00% Glass	100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black/ Silver		100.00% Other	None Detected

Initial report from: 06/26/2020 14:50:40



EMSL Analytical, Inc.

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EMSL Order: 062010086
Customer ID: DVBI69
Customer PO:
Project ID:

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID KC-ACM-RM-3-02 062010086-0006		Description	Roof, North Side Roof, Entrance Door - Roof Tar		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black/ Silver	<1.00% Glass	100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black/ Silver		100.00% Other	None Detected
Sample ID KC-ACM-CM-4-01 062010086-0007		Description	Roof, Entrance Door - Cementitious Material - Under - On Deck		
		Homogeneity	Heterogeneous		
PLM NYS 198.1 Friable	06/25/2020	Gray	2.00% Cellulose 3.00% Glass	12.00% Ca Carbonate 60.00% Gypsum 23.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-CM-4-02 062010086-0008		Description	Roof, Entrance Door - Cementitious Material - Under - On Deck		
		Homogeneity	Heterogeneous		
PLM NYS 198.1 Friable	06/25/2020	Gray	2.00% Cellulose 5.00% Glass	5.00% Ca Carbonate 65.00% Gypsum 23.00% Non-fibrous (other)	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-RFP-5-01 062010086-0009		Description	Roof, Under Block on Roof - South Side - Felt Paper		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-RFP-5-02 062010086-0010		Description	Roof, Under Block on Roof - Southeast Side - Felt Paper		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-RM-6-01 062010086-0011		Description	Roof, South Side of Roof - Roof Tar - Under Foam Insulation		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected

Initial report from: 06/26/2020 14:50:40



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EMSL Order: 062010086
Customer ID: DVBI69
Customer PO:
Project ID:

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID KC-ACM-RM-6-02 062010086-0012			Description Roof, Southeast Side of Roof - Roof Tar - Under Foam Insulation		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-BM-7-01 062010086-0013			Description Exterior, East Corner - Brick Mortar		
			Homogeneity Heterogeneous		
PLM NYS 198.1 Friable	06/25/2020	Gray		6.00% Ca Carbonate 24.00% Non-fibrous (other) 70.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-BM-7-02 062010086-0014			Description Exterior, South Corner - Brick Mortar		
			Homogeneity Heterogeneous		
PLM NYS 198.1 Friable	06/25/2020	Gray		12.00% Ca Carbonate 18.00% Non-fibrous (other) 70.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-RVT-8-01 062010086-0015			Description Roof, Large Hatch Door - Roof Vent Tar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black/ Silver		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black/ Silver		100.00% Other	None Detected
Sample ID KC-ACM-RVT-8-02 062010086-0016			Description Roof, Sister Hatch - Roof Vent Tar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black/ Silver		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black/ Silver		100.00% Other	None Detected
Sample ID KC-ACM-PPS-9-01 062010086-0017			Description Lower Level, Inside - Tar / Pipe Penetration Sealant - Black		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black	None	95.70% Other	4.30% Chrysotile
TEM NYS 198.4 NOB	06/26/2020				Not Analyzed

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EMSL Order: 062010086
Customer ID: DVBI69
Customer PO:
Project ID:

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID KC-ACM-PPS-9-02 062010086-0018			Description Lower Level, Inside - Tar / Pipe Penetration Sealant - Black Homogeneity		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020				Positive Stop (Not Analyzed)
TEM NYS 198.4 NOB	06/26/2020				Not Analyzed
Sample ID KC-ACM-PPC-10-01 062010086-0019			Description Lower Level, Pipe - Pipe Penetration Cement Homogeneity Heterogeneous		
PLM NYS 198.1 Friable	06/25/2020	Gray		12.00% Ca Carbonate 16.00% Non-fibrous (other) 72.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-PPC-10-02 062010086-0020			Description Lower Level, Pipe - Pipe Penetration Cement Homogeneity Homogeneous		
PLM NYS 198.1 Friable	06/25/2020	Gray		8.00% Ca Carbonate 22.00% Non-fibrous (other) 70.00% Quartz	None Detected
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-FLT-11-01 062010086-0021			Description Exterior, East Side - Felt Paper - Under Metal Siding Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-FLT-11-02 062010086-0022			Description Exterior, West Side - Felt paper Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/25/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected

Initial report from: 06/26/2020 14:50:40



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EMSL Order: 062010086
Customer ID: DVBI69
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Material

The samples in this report were submitted to EMSL for analysis by Asbestos Analysis of Bulk Materials via NYS ELAP Approved Methods. The reference number for these samples is the EMSL Order ID above. Please use this reference number when calling about these samples.

Report Comments:

Sample Receipt Date: 6/19/2020
Analysis Completed Date: 6/25/2020

Sample Receipt Time: 2:11 PM
Analysis Completed Time: 1:23 PM

Analyst(s):

Erick Rosa PLM NYS 198.1 Friable (6)

Erick Rosa PLM NYS 198.6 NOB (15)

Jackson Li TEM NYS 198.4 NOB (14)

Samples reviewed and approved by:

Daniel Clarke, Asbestos Laboratory Manager
or Other Approved Signatory

NOB = Non Friable Organically Bound N/A = Not Applicable VCM = Vermiculite Containing Material

-In New York State, TEM is currently the only method that can be used to determine if NOB materials can be considered or treated as non-asbestos containing.

All samples examined for the presence of vermiculite when analyzed via NYS 198.1.

-NYS Guidelines for Vermiculite containing samples are available at http://www.wadsworth.org/labcert/elapcert/forms/VermiculiteInterimGuidance_Rev070913.pdf EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples were received in good condition unless otherwise noted.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. This report may contain data that is not covered by the NVLAP accreditation.

Samples analyzed by EMSL Analytical, Inc. Carle Place, NY NYS ELAP 11469

Initial report from: 06/26/2020 14:50:40



ASBESTOS BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

Client Name: WCA DPW
Project Name and Address: Westchester County Airport, Tanager E
Inspector/Investigator: Kumar Chakraborty
Page: 1 of 2
Date: 6-17-2020
 2 Hour 6 Hour 24 Hour
 48 Hour 72 Hour Other Week HR
Project Manager: Mike Ho-fgren
Project Number: 5468-01

BULK SAMPLE INFORMATION

Bulk Sample ID No.	Material Description	Floor ID	Room/Area Description	Condition / Friability	Photo ID/ Time
KC-ACM- FT -1-01	Flushing Jar Under Metal	Roof	Flushing Jar under Metal	P/NF	
FT-1-02	"	"	" " " NW Side	P/NF	
KC-ACM-TAR-2-01	Tar under metal door joint siding	Extnd	Northwest side of siding	P/NF	
-02	"	"	West side of "	P/NF	
KC-ACM-RM-3-01	Entrance door - Roof Tar	"	South side Roof		
3-02	"	"	North side roof		
KC-ACM-CM-4-01	Cementitious Roof Tar Material Under deck	Roof	Roof - Tar Under Roof	south side	
02	"	"	" " " North side		
KC-ACM-RFP-5-01	Felt Paper	Roof	Felt Paper under block on roof	south side	
-02	"	Roof	" " " " Southeast side		

Condition: D - Damage, SD - Significant Damage
Special Instruction to Laboratory:
 Analyze All Samples Stop at First Positive in Each Homogeneous Group Perform TEM-NOB Analysis if Necessary
 Email Results to: kchakraborty@db-eng.com

CHAIN OF CUSTODY INFORMATION AND LABORATORY INFORMATION

Relinquished By:	Date	Time	Received By:	Date	Time	Method Of Submittal
I. (Print): P.K. CHAKRABORTY	6/17/2020		Nichelle Davis	6/17/2020	2:11 PM	Field
II. (Sign): <i>[Signature]</i>						Walk In
III. (Print):						Fed-Ex
(Sign):						Others
(Print):						Fed-Ex
(Sign):						Others

Lab Comments:
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062010086



ASBESTOS BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

Client Name: WCA - DPW
Project Name and Address: Westchester County Airport - Hangar E

Inspector/Investigator: Kumar Chakraborty

Page: 2 of 2

Date: 6-17-2020
Requested Turnaround Time:
 2 Hour 6 Hour 24 Hour 48 Hour 72 Hour
 Other: 1 Week HR

Project Manager: Mike Hofgren
Project Number: 5468-01

BULK SAMPLE INFORMATION

Bulk Sample ID No.	Material Description	Floor ID	Room/Area Description	Condition / Friability	Photo ID/ Time
KC-ACM-RM-6-01	Roof Tar Under foam Insulation	Roof	Southside of Roof	P/NF	
4	" " "		Southeast of "	P/NF	
KC-ACM-BM-7-01	Brick Mortar	Ext.	East Corner	P/NF	
7-02	" "	Ext.	South Corner	P/NF	
C-ACM-RVT-8-01	Roof Vent Tar	Roof	Large hatch door	P/NF	
8-02	" "	"	Sister hatch	P/NF	
KC-ACM-PPS-9-01	Tar Mortar (Pipe Pen. Sealant)	LL	Inside lower level	P/NF	
9-02	" " "	LL	" " "	P/NF	
KC-ACM-PPC-10-01	Pipe Penetration Cement	LL	Lower level pipe		
-02	" "	LL	" " "		
KC-ACM-FLT-11-02	Felt Paper	Ext.	Felt Paper Under Metal Siding E		
11-02	Felt Paper	"	" " " Westside	↓	

Condition:
 G - Good, D - Damage, SD - Significant Damage
 Friability: F - Friable, NF - Not Friable

Special Instruction to Laboratory:
 Analyze All Samples Stop at First Positive in Each Homogeneous Group Perform TEM-NOB Analysis if Necessary
 Email Results to: kchakraborty@db-eng.com

CHAIN OF CUSTODY INFORMATION AND LABORATORY INFORMATION

Relinquished By:	Date	Time	Received By:	Date	Time	Method Of Submittal
I. (Print): P.K. CHAKRABORTY	6/17/2020		Mike Hofgren	6/17/20	2:11 PM	Field
(Sign): <i>[Signature]</i>						Walk In
II. (Print):						Fed-Ex
(Sign):						Others
III. (Print):						Fed-Ex
(Sign):						Others

Lab Comments:

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EMSL Order: 062010206
Customer ID: DVBI69
Customer PO:
Project ID:

Attention: Mike Hofgren
D&B Engineers and Architects, P.C.
330 Crossway Park Drive
Woodbury, NY 11797

Phone: (516) 364-9890
Fax: (516) 364-9045
Received Date: 06/19/2020 2:09 PM
Analysis Date: 06/26/2020 - 06/27/2020
Collected Date: 06/17/2020

Project: WCDPW, Westchester County Airport, Backflow Prevention Building, #5468-01

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID KC-ACM-TLCR-1-01 <i>062010206-0001</i>			Description Roof - On Concrete Roof - West Side - Roof Tar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-TLCR-1-02 <i>062010206-0002</i>			Description Roof - On Concrete Roof - East Side - Roof Tar		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-TJOR-2-01 <i>062010206-0003</i>			Description Roof - On Concrete Roof - West Side - Tar Joint		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-TJOR-2-02 <i>062010206-0004</i>			Description Roof - On Concrete Roof - East Side - Tar Joint		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-CAU-3-01 <i>062010206-0005</i>			Description Exterior - On Slab Joint - Caulk		
			Homogeneity Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Pink		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Pink		100.00% Other	None Detected

Initial report from: 06/27/2020 09:26:42



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<http://www.EMSL.com> / carleplacelab@emsl.com

EMSL Order: 062010206
Customer ID: DVBI69
Customer PO:
Project ID:

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID KC-ACM-CAU-3-02 062010206-0006		Description	Exterior - On Slab Joint - Caulk		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Pink		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Pink		100.00% Other	None Detected
Sample ID KC-ACM-PPS-4-01 062010206-0007		Description	Interior - Vertical Pipe - Cementitious Pipe Penetration Sealant		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	06/26/2020	Brown/ Gray	None	20.00% Ca Carbonate 60.00% Quartz 20.00% Vermiculite	
Vermiculite > 10% - Analysis via NYS ELAP 198.6 required.					
PLM NYS 198.6 VCM	06/27/2020	Brown/ Gray		67.00% Other	None Detected
This method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing > 10% vermiculite.					
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-PPS-4-02 062010206-0008		Description	Interior - Vertical Pipe - Cementitious Pipe Penetration Sealant		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable	06/26/2020	Brown/ Gray	None	25.00% Ca Carbonate 60.00% Quartz 15.00% Vermiculite	
Vermiculite > 10% - Analysis via NYS ELAP 198.6 required.					
PLM NYS 198.6 VCM	06/27/2020	Brown/ Gray		63.00% Other	None Detected
This method does not remove vermiculite and may underestimate the level of asbestos present in a sample containing > 10% vermiculite.					
PLM NYS 198.6 NOB					Not Analyzed
TEM NYS 198.4 NOB					Not Analyzed
Sample ID KC-ACM-TAR-5-01 062010206-0009		Description	Interior - On Ceiling Slab - Tar Joint		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-TAR-5-02 062010206-0010		Description	Interior - On Ceiling Slab - Tar Joint		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Black		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Black		100.00% Other	None Detected
Sample ID KC-ACM-VC-6-01 062010206-0011		Description	Exterior - Vent - West Side - Vent Caulk		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Pink		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Pink		100.00% Other	None Detected

Initial report from: 06/27/2020 09:26:42



EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514
Tel/Fax: (516) 997-7251 / (516) 997-7528
<http://www.EMSL.com> / carleplacelab@emsl.com

EMSL Order: 062010206
Customer ID: DVBI69
Customer PO:
Project ID:

Test Report:Asbestos Analysis of Bulk Material

Test	Analyzed Date	Color	Non-Asbestos		Asbestos
			Fibrous	Non-Fibrous	
Sample ID KC-ACM-VC-6-02 062010206-0012		Description	Exterior - Vent - East Side - Vent Caulk		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Pink		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Pink		100.00% Other	None Detected
Sample ID KC-ACM-CAU-7-01 062010206-0013		Description	Interior - Corner Joint - East Corner - Joint Caulk		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Gray		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Gray		100.00% Other	None Detected
Sample ID KC-ACM-CAU-7-02 062010206-0014		Description	Interior - Corner Joint - West Corner - Joint Caulk		
		Homogeneity	Homogeneous		
PLM NYS 198.1 Friable					Not Analyzed
PLM NYS 198.6 VCM					Not Analyzed
PLM NYS 198.6 NOB	06/26/2020	Gray		100.00% Other	Inconclusive: None Detected
TEM NYS 198.4 NOB	06/26/2020	Gray		100.00% Other	None Detected

Initial report from: 06/27/2020 09:26:42



EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514
Tel/Fax: (516) 997-7251 / (516) 997-7528
<http://www.EMSL.com> / carleplacelab@emsl.com

EMSL Order: 062010206
Customer ID: DVBI69
Customer PO:
Project ID:

Test Report:Asbestos Analysis of Bulk Material

The samples in this report were submitted to EMSL for analysis by Asbestos Analysis of Bulk Materials via NYS ELAP Approved Methods. The reference number for these samples is the EMSL Order ID above. Please use this reference number when calling about these samples.

Report Comments:

Sample Receipt Date: 6/19/2020
Analysis Completed Date: 6/26/2020

Sample Receipt Time: 2:09 PM
Analysis Completed Time: 11:19 AM

Analyst(s):

Tomas Montes De Oca PLM NYS 198.1 Friable (2)

Tomas Montes De Oca PLM NYS 198.6 NOB (12)

Tomas Montes De Oca PLM NYS 198.6 VCM (2)

Jackson Li TEM NYS 198.4 NOB (12)

Samples reviewed and approved by:

Daniel Clarke, Asbestos Laboratory Manager
or Other Approved Signatory

NOB = Non Friable Organically Bound N/A = Not Applicable VCM = Vermiculite Containing Material
-In New York State, TEM is currently the only method that can be used to determine if NOB materials can be considered or treated as non-asbestos containing.
All samples examined for the presence of vermiculite when analyzed via NYS 198.1.
-NYS Guidelines for Vermiculite containing samples are available at http://www.wadsworth.org/labcert/elapcert/forms/VermiculiteInterimGuidance_Rev070913.pdf EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples were received in good condition unless otherwise noted.
This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. This report may contain data that is not covered by the NVLAP accreditation.

Samples analyzed by EMSL Analytical, Inc. Carle Place, NY NYS ELAP 11469

Initial report from: 06/27/2020 09:26:42



ASBESTOS BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

Client Name: WCDPW
Project Name and Address: Westchester County Airport - Backflow Prevention Building
Inspector/Investigator: Kumar Chakraborty
Page: 1 of 2
Date: 6/17/2020
Requested Turnaround Time: 2 Hour 6 Hour 24 Hour 48 Hour 72 Hour Other 1 Week HR
Project Manager: Mike Hefgren
Project Number: 5468-01

BULK SAMPLE INFORMATION

Bulk Sample ID No.	Material Description	Floor ID	Room/Area Description	Condition / Friability	Photo ID/ Time
KC-ACM-TLCR-1-01	Roof Tar	Roof	Tar layer on Concrete Roof - West side	P/NF	
-02	" "		" " " East side		
KC-ACM-TJOR-2-01	Tar Joint on concrete roof		Tar roof joint - West side		
-02	" "		" " " East side		
CC-ACM-CAU-3-01	Ext. caulk on slab joint		Slab joint on siding - N side		
→ -02	" "		slab joint on " Southside		
CC-ACM-PPS-4-01	Cementitious Pipe Penetration Sealant	INT	Interior Vertical Pipe		
→ -02	" "		" "		
CC-ACM-TAR-5-01	Interior Tar Joint		Tar joint on Ceiling Slab		
→ -02	" "		" "		
KC-ACM					

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 CARLE PLACE, NY
 20 JUN 20 11:50 AM

Condition:
 G - Good, D - Damage, SD - Significant Damage
 Friability: F - Friable, NF - Not Friable
 Special Instruction to Laboratory:
 Analyze All Samples Stop at First Positive in Each Homogeneous Group Perform TEM-NOB Analysis if Necessary
 Email Results to: kchakraborty@db-eng.com

CHAIN OF CUSTODY INFORMATION AND LABORATORY INFORMATION

Relinquished By:	Date	Time	Received By:	Date	Time	Method Of Submittal
I. (Print): Kumar Chakraborty	6/17/2020		Mike Hefgren	6/19/20	2:09 PM	Field
(Sign):						Walk In
II. (Print):						Fed-Ex
(Sign):						Others
III. (Print):						Fed-Ex
(Sign):						Others

D&B Comments:
 TEM - DZ 6/26/20
 Print Name: Tomás Montes De Oca
 Sign: Tomás Montes De Oca
 Date & Time: 6/26/20 11:50 am

062010206

T.M. 6/27/20

ASBESTOS BULK SAMPLE DATA AND CHAIN OF CUSTODY FORM

Client Name: WC DPW
Project Name and Address: Westchester County Airport - Blackflow Presentation Building
Inspector/Investigator: Kumar Chakraborty
Page: 2 of 2
Date: 6/17/2020
Requested Turnaround Time: 2 Hour 6 Hour 24 Hour 48 Hour 72 Hour Other 1 week HR
Project Manager: MH
Project Number: 5468-02

BULK SAMPLE INFORMATION					Photo ID/ Time
Bulk Sample ID No.	Material Description	Floor ID	Room/Area Description	Condition / Friability	
KC-ACM-VC-6-01-02	Vent Caulk	Ext.	Exterior Vent - Westside	P/NF	
	"	↓	" Eastside	↓	
KC-ACM-CAU-7-01	Joint Caulk - Corners	Int.	Interior Corner Joint - East Corner		
↓ ↓ -02	" "	Int.	" " West		

Condition: G - Good, D - Damage, SD - Significant Damage
Friability: F - Friable, NF - Not Friable
Special Instruction to Laboratory: Analyze All Samples Stop at First Positive in Each Homogeneous Group Perform TEM-NOB Analysis if Necessary
 Email Results to: kchakraborty@db-eng.com

CHAIN OF CUSTODY INFORMATION AND LABORATORY INFORMATION
Relinquished By: Kumar Chakraborty 6/17/2020
Received By: Michelle Dine 6/17/2020 2:45 pm
Method Of Submittal: Walk In
Field: [Signature]
Walk In: [Signature]
Fed-Ex: [Signature]
Others: [Signature]
Fed-Ex: [Signature]
Others: [Signature]

D&B Comments: TEM - [Signature] 6/26/20 11:50 am
 Print Name: Thomas Monte De Oca
 Sign: Thomas Monte De Oca

062010206

T.M. 6/27/20



EMSL Analytical, Inc.

528 Mineola Avenue, Carle Place, NY 11514

Phone/Fax: (516) 997-7251 / (516) 997-7528

<http://www.EMSL.com>

carleplacelab@emsl.com

EMSL Order:	062010179
CustomerID:	DVBI69
CustomerPO:	5468-01
ProjectID:	

Attn: **Kumar Chakroborty**
D&B Engineers and Architects, P.C.
330 Crossway Park Drive
Woodbury, NY 11797

Phone: (516) 364-9890
 Fax: (516) 364-9045
 Received: 06/19/20 2:11 PM
 Collected: 6/18/2020

Project: **5468-01**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3051A/7000B)*

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>Lead Concentration</i>
KC-LBP-01 Site: Ext. yellow paint form fire hose valve - Metal	062010179-0001	6/18/2020	6/26/2020	0.2514 g	150000 ppm
KC-LBP-02 Site: Ext. door frame SW corner - Grey - Metal	062010179-0002	6/18/2020	6/26/2020	0.2310 g	74000 ppm
KC-LBP-03 Site: WCDPW Hangar D / Blakc paint from roller door - ext.	062010179-0003	6/18/2020	6/26/2020	0.2073 g	1900 ppm
KC-LBP-04 Site: White over green paint on brick wall	062010179-0004	6/18/2020	6/26/2020	0.2501 g	<80 ppm
KC-LBP-05 Site: Orange paint from 12" dia. Pipe	062010179-0005	6/18/2020	6/26/2020	0.2680 g	260 ppm
KC-LBP-06 Site: Yellow paint on 12" dia metal pipe	062010179-0006	6/18/2020	6/26/2020	0.2505 g	46000 ppm
KC-LBP-07 Site: Brown paint on foundation wall - north side	062010179-0007	6/18/2020	6/26/2020	0.2636 g	2100 ppm
KC-LBP-08 Site: Grey paint on concrete pad	062010179-0008	6/18/2020	6/26/2020	0.2608 g	3000 ppm
KC-LBP-09 Site: Green paint on 6" dia pipe	062010179-0009	6/18/2020	6/26/2020	0.1466 g	240 ppm
KC-LBP-10 Site: Red paint on motor	062010179-0010	6/18/2020	6/26/2020	0.2619 g	29000 ppm
KC-LBP-11 Site: Red paint on foam tank	062010179-0011	6/18/2020	6/26/2020	0.2500 g	<80 ppm
KC-LBP-12 Site: Black paint from ceiling truss - Metal	062010179-0012	6/18/2020	6/26/2020	0.2570 g	270 ppm

Alger Liang, Lead Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.

Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008% wt based on the minimum sample weight per our SOP. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Carle Place, NY Lab ID 102344 is accredited by AIHA LAP, LLC in the env. accreditation program for Lead in Paint, CT PH-0249, NYS ELAP 11469, CA 2339

Initial report from 06/26/2020 21:48:53



EMSL ANALYTICAL, INC.
LABORATORY PRODUCTS TRAINING

Lead (Pb) Chain of Custody

EMSL Order ID (Lab Use Only):

062010179

PHONE: ()

FAX: ()

Company: DKB Engineers and Architects		EMSL-Bill to: <input type="checkbox"/> Same <input type="checkbox"/> Different If Bill to is Different note instructions in Comments**	
Street: 330 Crossway Park Drive		Third Party Billing requires written authorization from third party	
City: Woodbury	State/Province: NY	Zip/Postal Code: 11797	Country:
Report To (Name): Kumar Chakraborty		Telephone #: 516-939-7681	
Email Address: KChakraborty@ddb-eng.com		Fax #:	Purchase Order:
Project Name/Number: 5468-01		Please Provide Results: <input type="checkbox"/> Fax <input type="checkbox"/> Email	
U.S. State Samples Taken: NY		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide*

Matrix	Method	Instrument	Reporting Limit	Check
Chips <input type="checkbox"/> % by wt. <input type="checkbox"/> mg/cm ² <input checked="" type="checkbox"/> ppm (mg/kg)	SW846-7000B	Flame Atomic Absorption	0.01%	<input type="checkbox"/>
Air <input checked="" type="checkbox"/> (AL)	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	<input type="checkbox"/>
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	<input type="checkbox"/>
	NIOSH 7300M/NIOSH 7303	ICP-OES	0.5 µg/filter	<input type="checkbox"/>
Wipe* <input type="checkbox"/> ASTM <input type="checkbox"/> non ASTM <input type="checkbox"/> *if no box checked, non-ASTM Wipe assumed	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	<input type="checkbox"/>
	SW846-6010B or C	ICP-OES	1.0 µg/wipe	<input type="checkbox"/>
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1311/SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	<input type="checkbox"/>
SPLP	SW846-1312/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1312/SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	<input type="checkbox"/>
TTLC	22 CCR App. II, 7000B/7420	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	22 CCR App. II, SW846-6010B or C	ICP-OES	2 mg/kg (ppm)	<input type="checkbox"/>
STLC	22 CCR App. II, 7000B/7420	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	22 CCR App. II, SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	<input type="checkbox"/>
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	SW846-6010B or C	ICP-OES	2 mg/kg (ppm)	<input type="checkbox"/>
Wastewater Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.7	ICP-OES	0.020 mg/L (ppm)	<input type="checkbox"/>
Drinking Water Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.5	ICP-OES	0.003 mg/L (ppm)	<input type="checkbox"/>
TSP/SPM Filter	40 CFR Part 50	ICP-OES	12 µg/filter	<input type="checkbox"/>
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	<input type="checkbox"/>
Other:				<input type="checkbox"/>

Name of Sampler:		Signature of Sampler:	
Sample #	Location	Volume/Area	Date/Time Sampled
KE-LBP-1	Ext. Yellow Paint From Fire Hose Valve - Metal		6-18-2020
-02	Ext. Door Frame SW Corner - Grey - Metal		
Client Sample #s	Total # of Samples:		12
Relinquished (Client):	Date:	Time:	
Received (Lab):	Date:	Time:	
Comments:			

RECEIVED
 ANALYTICAL, INC.
 100 JEFFERSON PLACE, NY
 JUN 19 PM 2:11



EMSL Analytical, Inc.

528 Mineola Avenue, Carle Place, NY 11514

Phone/Fax: (516) 997-7251 / (516) 997-7528

<http://www.EMSL.com>

carleplacelab@emsl.com

EMSL Order: 062010176

CustomerID: DVBI69

CustomerPO: 5468-01

ProjectID:

Attn: **Kumar Chakroborty**
D&B Engineers and Architects, P.C.
330 Crossway Park Drive
Woodbury, NY 11797

Phone: (516) 364-9890
Fax: (516) 364-9045
Received: 06/19/20 2:11 PM
Collected: 6/17/2020

Project: **5468-01**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3051A/7000B)*

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>Lead Concentration</i>
KC-LBP-01 Site: Hangar E Desc: Paint (red) on exterior pipe - 12"	062010176-0001	6/17/2020	6/26/2020	0.2595 g	8400 ppm
KC-LBP-02 Site: Hangar E Desc: Green paint on 6" pipe	062010176-0002	6/17/2020	6/26/2020	0.0631 g	80000 ppm
KC-LBP-03 Site: Hangar E Desc: Green paint form compressor tank	062010176-0003	6/17/2020	6/26/2020	0.2567 g	110000 ppm
KC-LBP-04 Site: Hangar E Desc: Beige paint on generator	062010176-0004	6/17/2020	6/26/2020	0.0951 g	55000 ppm
KC-LBP-05 Site: Hangar E Desc: Orange paint on pipe	062010176-0005	6/17/2020	6/26/2020	0.0395 g	16000 ppm
KC-LBP-06 Site: Hangar E Desc: Black paint on metal truss	062010176-0006	6/17/2020	6/26/2020	0.0859 g	34000 ppm
KC-LBP-07 Site: Hangar E Desc: Red paint on pipe	062010176-0007	6/17/2020	6/26/2020	0.2579 g	160000 ppm
KC-LBP-08 Site: Hangar E Desc: Vent pipe - orange over grey	062010176-0008	6/17/2020	6/26/2020	0.1715 g	150000 ppm
KC-LBP-09 Site: Hangar E Desc: Beige paint on vertical pipe	062010176-0009	6/17/2020	6/26/2020	0.0983 g	45000 ppm
KC-LBP-10 Site: Hangar E Desc: Yellow paint on vertical pipe	062010176-0010	6/17/2020	6/26/2020	0.1663 g	110000 ppm
KC-LBP-11 Site: Hangar E Desc: Grey paint on door frame	062010176-0011	6/17/2020	6/26/2020	0.0837 g	42000 ppm

Alger Liang, Lead Laboratory Manager
or other approved signatory

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Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008% wt based on the minimum sample weight per our SOP. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Carle Place, NY Lab ID 102344 is accredited by AIHA LAP, LLC in the env. accreditation program for Lead in Paint, CT PH-0249, NYS ELAP 11469, CA 2339

Initial report from 06/26/2020 21:47:07



EMSL ANALYTICAL, INC.
LABORATORY PRODUCTS • TRAINING

Lead (Pb) Chain of Custody

EMSL Order ID (Lab Use Only):

PHONE: ()
FAX: ()

062010176

Company: D&B Engineers and Architects		EMSL-Bill to: <input type="checkbox"/> Same <input type="checkbox"/> Different <small>If Bill to is Different note instructions in Comments**</small>		
Street: 330 Crossway Park Dr.		Third Party Billing requires written authorization from third party		
City: Woodbury	State/Province: NY	Zip/Postal Code: 11797	Country:	
Report To (Name): Kumar Chakraborty		Telephone #: 516-328-939-7681		
Email Address: kchakraborty@ddb-eng.com		Fax #:	Purchase Order:	
Project Name/Number: 5468-01		Please Provide Results: <input type="checkbox"/> Fax <input type="checkbox"/> Email		
U.S. State Samples Taken:		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt		
Turnaround Time (TAT) Options* - Please Check				
<input type="checkbox"/> 3 Hour	<input type="checkbox"/> 6 Hour	<input type="checkbox"/> 24 Hour	<input type="checkbox"/> 48 Hour	
<input type="checkbox"/> 72 Hour	<input checked="" type="checkbox"/> 96 Hour	<input checked="" type="checkbox"/> 1 Week	<input type="checkbox"/> 2 Week	
<small>*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide</small>				
Matrix	Method	Instrument	Reporting Limit	Check
Chips <input type="checkbox"/> % by wt. <input type="checkbox"/> mg/cm ² <input checked="" type="checkbox"/> ppm (mg/kg)	SW846-7000B	Flame Atomic Absorption	0.01%	<input type="checkbox"/>
Air (AL)	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	<input type="checkbox"/>
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	<input type="checkbox"/>
	NIOSH 7300M/NIOSH 7303	ICP-OES	0.5 µg/filter	<input type="checkbox"/>
Wipe* ASTM <input type="checkbox"/> non ASTM <input type="checkbox"/> <small>*if no box checked, non-ASTM Wipe assumed</small>	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	<input type="checkbox"/>
	SW846-6010B or C	ICP-OES	1.0 µg/wipe	<input type="checkbox"/>
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1311/SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	<input type="checkbox"/>
SPLP	SW846-1312/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1312/SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	<input type="checkbox"/>
TTLC	22 CCR App. II, 7000B/7420	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	22 CCR App. II, SW846-6010B or C	ICP-OES	2 mg/kg (ppm)	<input type="checkbox"/>
STLC	22 CCR App. II, 7000B/7420	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	22 CCR App. II, SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	<input type="checkbox"/>
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	SW846-6010B or C	ICP-OES	2 mg/kg (ppm)	<input type="checkbox"/>
Wastewater Unpreserved <input type="checkbox"/> Preserved with HNO₃ pH < 2 <input type="checkbox"/>	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.7	ICP-OES	0.020 mg/L (ppm)	<input type="checkbox"/>
Drinking Water Unpreserved <input type="checkbox"/> Preserved with HNO₃ pH < 2 <input type="checkbox"/>	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.5	ICP-OES	0.003 mg/L (ppm)	<input type="checkbox"/>
TSP/SPM Filter	40 CFR Part 50	ICP-OES	12 µg/filter	<input type="checkbox"/>
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	<input type="checkbox"/>
Other:				
Name of Sampler:			Signature of Sampler:	
Sample #	Location	Volume/Area	Date/Time Sampled	
KCLBR-01	Hanger-E - Paint (red) on Exterior Pipe - 12" φ		6-27-2020	
-02	@ " " - Green Paint on 6" φ PIPE		JUN 1 11 19 AM '20	
Client Sample #s:			Total # of Samples:	
Relinquished (Client): Kumar Chakraborty		Date: 6-17-2020	Time:	
Received (Lab): Alger Lamy		Date: 06/19/20 @ 2:11PM	Time:	
Comments:				

RECEIVED
 EMSL ANALYTICAL, INC.
 CARLE PLACE, NY

**EMSL Analytical, Inc.**

528 Mineola Avenue, Carle Place, NY 11514

Phone/Fax: (516) 997-7251 / (516) 997-7528

<http://www.EMSL.com>carleplacelab@emsl.com

EMSL Order:	062010181
CustomerID:	DVBI69
CustomerPO:	
ProjectID:	

Attn: **Kumar Chakroborty**
D&B Engineers and Architects, P.C.
330 Crossway Park Drive
Woodbury, NY 11797

Phone: (516) 364-9890
 Fax: (516) 364-9045
 Received: 06/19/20 2:10 PM
 Collected: 6/17/2020

Project: 5468-01

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3051A/7000B)*

<i>Client Sample Description</i>	<i>Lab ID</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Lead Concentration</i>
KC-LBP-01	062010181-0001	6/17/2020	6/26/2020	<0.028 % wt
Site: Backflow prevention - Lead paint on 12" dia pipe				

Alger Liang, Lead Laboratory Manager
 or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted.

Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008% wt based on the minimum sample weight per our SOP. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request.

Samples analyzed by EMSL Analytical, Inc. Carle Place, NY Lab ID 102344 is accredited by AIHA LAP, LLC in the env. accreditation program for Lead in Paint, CT PH-0249, NYS ELAP 11469, CA 2339

Initial report from 06/26/2020 10:43:23



EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Lead (Pb) Chain of Custody

EMSL Order ID (Lab Use Only):

PHONE: ()
FAX: ()

062010181

Company: D&B Engineers and Architects		EMSL-Bill to: <input type="checkbox"/> Same <input type="checkbox"/> Different <small>If Bill to is Different note instructions in Comments**</small>	
Street: 330 Crossway Park Drive		Third Party Billing requires written authorization from third party	
City: Woodbury	State/Province: NY	Zip/Postal Code: 11797	Country:
Report To (Name): Kumar Chakraborty		Telephone #:	
Email Address: Kcha.kraborty@db-eng.com		Fax #:	Purchase Order:
Project Name/Number: 5468-01		Please Provide Results: <input type="checkbox"/> Fax <input type="checkbox"/> Email	
U.S. State Samples Taken: NY		CT Samples: <input type="checkbox"/> Commercial/Taxable <input type="checkbox"/> Residential/Tax Exempt	

Turnaround Time (TAT) Options* - Please Check

3 Hour
 6 Hour
 24 Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

*Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide

Matrix	Method	Instrument	Reporting Limit	Check
Chips <input type="checkbox"/> % by wt. <input type="checkbox"/> mg/cm ² <input checked="" type="checkbox"/> ppm (mg/kg)	SW846-7000B	Flame Atomic Absorption	0.01%	<input type="checkbox"/>
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	<input type="checkbox"/>
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	<input type="checkbox"/>
	NIOSH 7300M/NIOSH 7303	ICP-OES	0.5 µg/filter	<input type="checkbox"/>
Wipe* <input type="checkbox"/> ASTM non ASTM <input type="checkbox"/> <small>*if no box checked, non-ASTM Wipe assumed</small>	SW846-7000B	Flame Atomic Absorption	10 µg/wipe	<input type="checkbox"/>
	SW846-6010B or C	ICP-OES	1.0 µg/wipe	<input type="checkbox"/>
TCLP	SW846-1311/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1311/SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	<input type="checkbox"/>
SPLP	SW846-1312/7000B/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	SW846-1312/SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	<input type="checkbox"/>
TTLC	22 CCR App. II, 7000B/7420	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	22 CCR App. II, SW846-6010B or C	ICP-OES	2 mg/kg (ppm)	<input type="checkbox"/>
STLC	22 CCR App. II, 7000B/7420	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	22 CCR App. II, SW846-6010B or C	ICP-OES	0.1 mg/L (ppm)	<input type="checkbox"/>
Soil	SW846-7000B	Flame Atomic Absorption	40 mg/kg (ppm)	<input type="checkbox"/>
	SW846-6010B or C	ICP-OES	2 mg/kg (ppm)	<input type="checkbox"/>
Wastewater Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	SM3111B/SW846-7000B	Flame Atomic Absorption	0.4 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.7	ICP-OES	0.020 mg/L (ppm)	<input type="checkbox"/>
Drinking Water Unpreserved <input type="checkbox"/> Preserved with HNO ₃ pH < 2 <input type="checkbox"/>	EPA 200.8	ICP-MS	0.001 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	<input type="checkbox"/>
	EPA 200.5	ICP-OES	0.003 mg/L (ppm)	<input type="checkbox"/>
TSP/SPM Filter	40 CFR Part 50	ICP-OES	12 µg/filter	<input type="checkbox"/>
	40 CFR Part 50	Graphite Furnace AA	3.6 µg/filter	<input type="checkbox"/>
Other:				<input type="checkbox"/>

Name of Sampler:		Signature of Sampler:	
Sample #	Location	Volume/Area	Date/Time Sampled
KC-LBP-01	Blackflow Prevention Tank - Lead paint on 12" Ø pipe	Ø 12" Ø pipe	6-17-2020

Client Sample #s	-	Total # of Samples:	20
Relinquished (Client):		Date:	6/17/2020
Received (Lab):		Date:	06/19/20 @ 02:10 PM
Comments:			

RECEIVED
 EMSL ANALYTICAL, INC.
 CHELSEA, NY
 JUN 19 PM 2:10



EMSL Analytical, Inc.

200 Route 130 North, Cinnaminson, NJ 08077

Phone: (856) 303-2500 Fax: (856) 858-4571 Email: EnvChemistry2@emsl.com

Attn:

Mike Hofgren
D&B Engineers and Architects, P.C.
330 Crossway Park Drive
Woodbury, NY 11797

7/7/2020

Phone: (516) 364-9890
Fax: (516) 364-9045

The following analytical report covers the analysis performed on samples submitted to EMSL Analytical, Inc. on 6/23/2020. The results are tabulated on the attached data pages for the following client designated project:

5468-01 Westchester County Airport - Backflow Prevention Bldg.

The reference number for these samples is EMSL Order #012006241. Please use this reference when calling about these samples. If you have any questions, please do not hesitate to contact me at (856) 303-2500.

Approved By:

Phillip Worby, Environmental Chemistry
Laboratory Director



The test results contained within this report meet the requirements of NELAP and/or the specific certification program that is applicable, unless otherwise noted.
NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, CA ELAP 1877

The samples associated with this report were received in good condition unless otherwise noted. This report relates only to those items tested as received by the laboratory. The QC data associated with the sample results meet the recovery and precision requirements established by the NELAP, unless specifically indicated. All results for soil samples are reported on a dry weight basis, unless otherwise noted. This report may not be reproduced except in full and without written approval by EMSL Analytical, Inc.

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077
 Phone/Fax: (856) 303-2500 / (856) 858-4571
<http://www.EMSL.com> EnvChemistry2@emsl.com

EMSL Order: 012006241
 CustomerID: DVBI69
 CustomerPO:
 ProjectID:

Attn: **Mike Hofgren**
D&B Engineers and Architects, P.C.
330 Crossway Park Drive
Woodbury, NY 11797

Phone: (516) 364-9890
 Fax: (516) 364-9045
 Received: 06/23/20 9:00 AM

Project: **5468-01 Westchester County Airport - Backflow Prevention Bldg.**

Analytical Results

Client Sample Description KC-PCB-CAU-01
 Slab Joint - Northside
Collected: 6/17/2020 **Lab ID:** 012006241-0001

Method	Parameter	Result	RL Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA					
3540C/8082A	Aroclor-1016	ND D	0.98 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1221	ND D	0.98 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1232	ND D	0.98 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1242	ND D	0.98 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1248	ND D	0.98 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1254	ND D	0.98 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1260	ND D	0.98 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1262	ND D	0.98 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1268	ND D	0.98 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH

Client Sample Description KC-PCB-CAU-02
 Ext. Vent - Caulk
Collected: 6/17/2020 **Lab ID:** 012006241-0002

Method	Parameter	Result	RL Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA					
3540C/8082A	Aroclor-1016	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1221	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1232	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1242	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1248	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1254	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1260	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1262	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1268	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH

Client Sample Description KC-PCB-CAU-03
 Int. White Joint Caulk
Collected: 6/17/2020 **Lab ID:** 012006241-0003

Method	Parameter	Result	RL Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA					
3540C/8082A	Aroclor-1016	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1221	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1232	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1242	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1248	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH

**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077
 Phone/Fax: (856) 303-2500 / (856) 858-4571
<http://www.EMSL.com> EnvChemistry2@emsl.com

EMSL Order:	012006241
CustomerID:	DVBI69
CustomerPO:	
ProjectID:	

Attn: **Mike Hofgren**
D&B Engineers and Architects, P.C.
330 Crossway Park Drive
Woodbury, NY 11797

Phone: (516) 364-9890
 Fax: (516) 364-9045
 Received: 06/23/20 9:00 AM

Project: **5468-01 Westchester County Airport - Backflow Prevention Bldg.**

Analytical Results

Client Sample Description KC-PCB-CAU-03 **Collected:** 6/17/2020 **Lab ID:** 012006241-0003
 Int. White Joint Caulk

Method	Parameter	Result	RL Units	Prep Date & Analyst	Analysis Date & Analyst
GC-SVOA					
3540C/8082A	Aroclor-1254	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1260	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1262	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH
3540C/8082A	Aroclor-1268	ND D	0.97 mg/Kg	6/26/2020 AB	06/30/20 0:00 EH

Definitions:

- MDL - method detection limit
- J - Result was below the reporting limit, but at or above the MDL
- ND - indicates that the analyte was not detected at the reporting limit
- RL - Reporting Limit (Analytical)
- D - Dilution Sample required a dilution which was used to calculate final results

012006241



PCB SAMPLE DATA AND CHAIN OF CUSTODY FORM

Client Name: **WC-DPW** Project Name and Address: **Westchester County Airport - Backflow Prevention Bldg.** Inspector/Investigator: **Kumar Chakraborty** Page: 1 of 1

Date: **6/17/2020** Requested Turnaround Time: 2 Hour 6 Hour 24 Hour 72 Hour Other **2 Week** HR **PH** Project Manager: **MH** Project Number: **5468-01**

BULK SAMPLE INFORMATION					
Bulk Sample ID No.	Material Description	Floor ID	Room/Area Description	Condition / Friability	Photo ID/ Time
1 KC-PCB-CAY-01	Ext. Caulk on Joint	Ext.	Slab Joint-Northside		
2 KC-PCB-CAY-02	Vent Caulk	"	Ext. Vent-Caulk		
3 KC-PCB-CAY-03	White Joint Caulk	"	Int. White Joint Caulk		

Condition: MD - Minor Damage, G - Good, P - Poor

Friability: F - Friable, NF - Not Friable

Special Instruction to Laboratory: Email Results to: kchakraborty@db-eng.com

CHAIN OF CUSTODY INFORMATION AND LABORATORY INFORMATION

Relinquished By:	Date	Time	Received By:	Date	Time	Method Of Submittal
I. (Print): K. CHAKRABORTY	6/17/20		Katherine Vaid	6-19-20	2:10PM	Field
(Sign): <i>[Signature]</i>			AM	6/22/20		Walk In
II. (Print):			COVERED	6/23/20	7:35 PM	Fed-Ex
(Sign):				9AM		Others
III. (Print):						Fed-Ex
(Sign):						Others

D&B Comments: **rec'd in plastic 6/23 CP**

Lab Comments:

By: _____ Date & Time: _____
 Print Name: _____
 Sign: _____

RECEIVED
 EMSL ANALYTICAL, INC.
 CARLE PLACE, NY
 20 JUN 19 PM 2:10

4°

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER



Expires 12:01 AM April 01, 2021
Issued April 01, 2020

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. DANIEL CLARKE
EMSL ANALYTICAL, INC.
528 MINEOLA AVE.
CARLE PLACE, NY 11514

NY Lab Id No: 11469

*is hereby APPROVED as an Environmental Laboratory for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved subcategories and/or analytes are listed below:*

Miscellaneous

Asbestos in Friable Material	Item 198.1 of Manual EPA 600/M4/82/020
Asbestos in Non-Friable Material-PLM	Item 198.6 of Manual (NOB by PLM)
Asbestos in Non-Friable Material-TEM	Item 198.4 of Manual
Asbestos-Vermiculite-Containing Material	Item 198.8 of Manual
Lead in Dust Wipes	EPA 7000B
Lead in Paint	EPA 7000B

Sample Preparation Methods

EPA 3051A

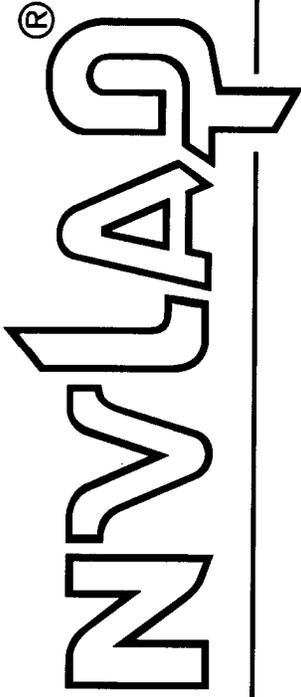
NEW
YORK
STATE

Department
of Health

Serial No.: 61402

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 101048-10

EMSL Analytical, Inc.
Carle Place, NY

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Asbestos Fiber Analysis

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).*

2019-07-01 through 2020-06-30

Effective Dates



A handwritten signature in black ink, appearing to read "Thomas S. Luman".

For the National Voluntary Laboratory Accreditation Program



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

EMSL Analytical, Inc.
528 Mineola Ave.
Carle Place, NY 11514
Daniel Clarke
Phone: 516-997-7251
Email: dclarke@emsl.com
http://www.emsl.com

ASBESTOS FIBER ANALYSIS

NVLAP LAB CODE 101048-10

Bulk Asbestos Analysis

<u>Code</u>	<u>Description</u>
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

<u>Code</u>	<u>Description</u>
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

A handwritten signature in black ink, appearing to read "Daniel Clarke".

For the National Voluntary Laboratory Accreditation Program



AIHA Laboratory Accreditation Programs, LLC

SCOPE OF ACCREDITATION

EMSL Analytical, Inc.
 528 Mineola Ave., Carle Place, NY 11514

Laboratory ID: **102344**
 Issue Date: 09/30/2019

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Industrial Hygiene Laboratory Accreditation Program (IHLAP)

Initial Accreditation Date: 10/01/2005

IHLAP Scope Category	Field of Testing (FoT) (FoTs cover all relevant IH matrices)	Technology sub-type/ Detector	Published Reference Method/Title of In-house Method	Method Description or Analyte <i>(for internal methods only)</i>
Asbestos/Fiber Microscopy Core	Phase Contrast Microscopy (PCM)		NIOSH 7400	
	Transmission Electron Microscopy (TEM)		EPA AHERA - 40 CFR Part 763	EPA AHERA Method (40 CFR 763, Subpart E, Appendix A), Mandatory Method
			NIOSH 7402	

A complete listing of currently accredited Industrial Hygiene laboratories is available on the AIHA-LAP, LLC website at: <http://www.aihaaccreditedlabs.org>



AIHA Laboratory Accreditation Programs, LLC SCOPE OF ACCREDITATION

EMSL Analytical, Inc.

528 Mineola Ave., Carle Place, NY 11514

Laboratory ID: **102344**

Issue Date: 05/03/2018

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

The EPA recognizes the AIHA-LAP, LLC ELLAP program as meeting the requirements of the National Lead Laboratory Accreditation Program (NLLAP) established under Title X of the Residential Lead-Based Paint Hazard Reduction Act of 1992 and includes paint, soil and dust wipe analysis. Air and composited wipes analyses are not included as part of the NLLAP.

Environmental Lead Laboratory Accreditation Program (ELLAP)

Initial Accreditation Date: 08/15/1999

Field of Testing (FoT)	Technology sub-type/ Detector	Method	Method Description <i>(for internal methods only)</i>
Paint		EPA SW-846 3050B	
		EPA SW-846 3051A	
		EPA SW-846-7000B	
Soil		EPA SW-846 3050B	
		EPA SW-846 3051A	
		EPA SW-846-7000B	
Settled Dust by Wipe		EPA SW-846 3050B	
		EPA SW-846 3051A	
		EPA SW-846-7000B	
Airborne Dust		NIOSH 7082	

A complete listing of currently accredited Environmental Lead laboratories is available on the AIHA-LAP, LLC website at: <http://www.aihaaccreditedlabs.org>

NEW YORK STATE DEPARTMENT OF HEALTH
WADSWORTH CENTER



Expires 12:01 AM April 01, 2021
Issued April 01, 2020
Revised April 07, 2020

CERTIFICATE OF APPROVAL FOR LABORATORY SERVICE

Issued in accordance with and pursuant to section 502 Public Health Law of New York State

MR. PHILLIP M. WORBY
EMSL ANALYTICAL INC
200 ROUTE 130 NORTH
CINNAMINSON, NJ 08077

NY Lab Id No: 10872

*is hereby APPROVED as an Environmental Laboratory in conformance with the
National Environmental Laboratory Accreditation Conference Standards (2003) for the category
ENVIRONMENTAL ANALYSES SOLID AND HAZARDOUS WASTE
All approved analytes are listed below:*

Polychlorinated Biphenyls

Aroclor 1016 (PCB-1016)	EPA 8082A
Aroclor 1221 (PCB-1221)	EPA 8082A
Aroclor 1232 (PCB-1232)	EPA 8082A
Aroclor 1242 (PCB-1242)	EPA 8082A
Aroclor 1248 (PCB-1248)	EPA 8082A
Aroclor 1254 (PCB-1254)	EPA 8082A
Aroclor 1260 (PCB-1260)	EPA 8082A
Aroclor 1262 (PCB-1262)	EPA 8082A
Aroclor 1268 (PCB-1268)	EPA 8082A
PCB 1	EPA 8082A
PCB 101	EPA 8082A
PCB 110	EPA 8082A
PCB 138	EPA 8082A
PCB 141	EPA 8082A
PCB 151	EPA 8082A
PCB 153	EPA 8082A
PCB 170	EPA 8082A
PCB 18	EPA 8082A
PCB 180	EPA 8082A
PCB 183	EPA 8082A
PCB 187	EPA 8082A
PCB 206	EPA 8082A
PCB 31	EPA 8082A
PCB 44	EPA 8082A
PCB 5	EPA 8082A
PCB 52	EPA 8082A

Polychlorinated Biphenyls

PCB 66	EPA 8082A
PCB 87	EPA 8082A

Polynuclear Aromatic Hydrocarbons

2-Acetylaminofluorene	EPA 8270D
Acenaphthene	EPA 8270D
Acenaphthylene	EPA 8270D
Anthracene	EPA 8270D
Benzo(a)anthracene	EPA 8270D
Benzo(a)pyrene	EPA 8270D
Benzo(b)fluoranthene	EPA 8270D
Benzo(g,h,i)perylene	EPA 8270D
Benzo(k)fluoranthene	EPA 8270D
Chrysene	EPA 8270D
Dibenzo(a,h)anthracene	EPA 8270D
Fluoranthene	EPA 8270D
Fluorene	EPA 8270D
Indeno(1,2,3-cd)pyrene	EPA 8270D
Naphthalene	EPA 8270D
Phenanthrene	EPA 8270D
Pyrene	EPA 8270D

Priority Pollutant Phenols

2,3,4,6 Tetrachlorophenol	EPA 8270D
2,4,5-Trichlorophenol	EPA 8270D
2,4,6-Trichlorophenol	EPA 8270D
2,4-Dichlorophenol	EPA 8270D

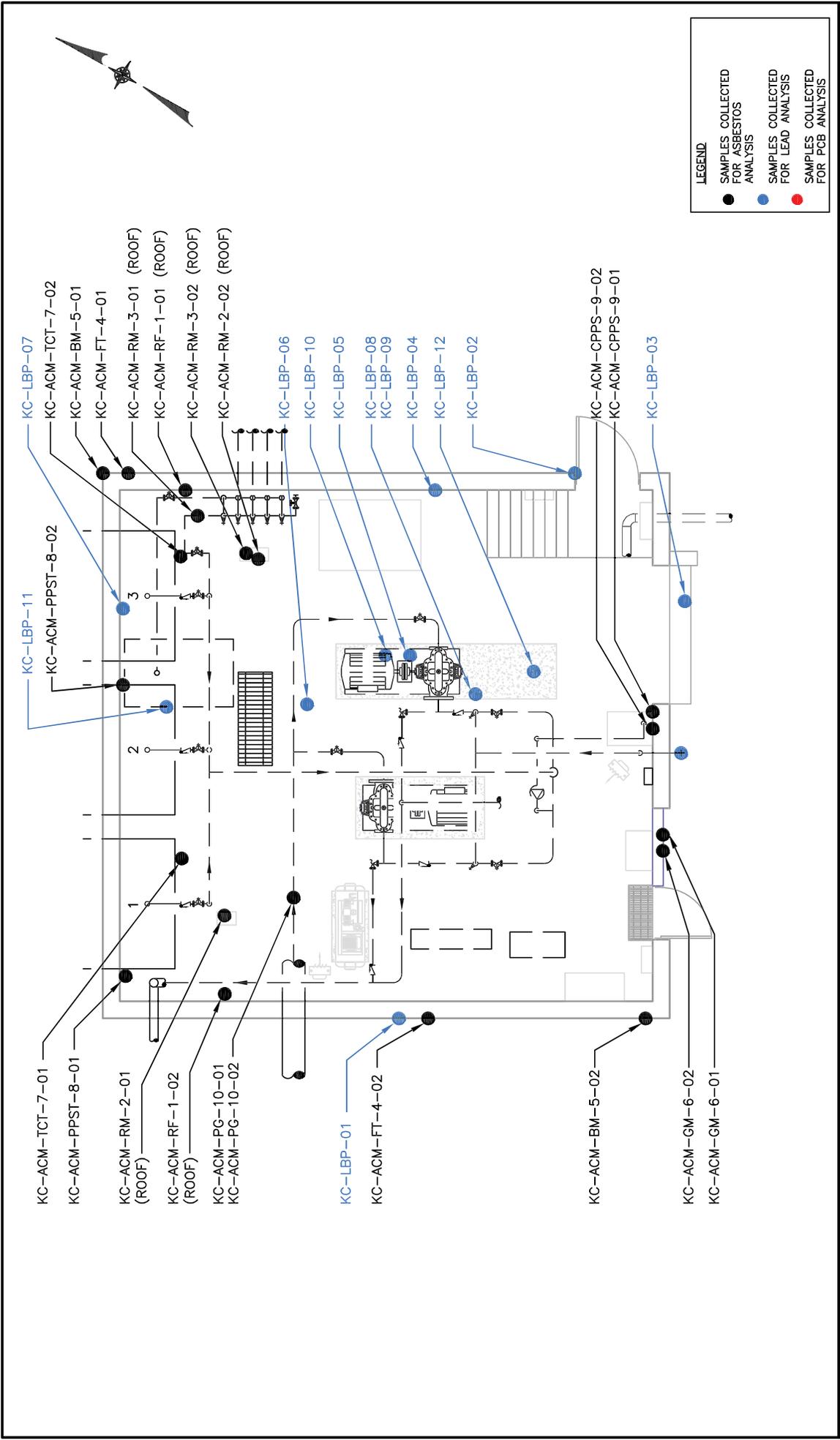
Serial No.: 61934

Property of the New York State Department of Health. Certificates are valid only at the address shown, must be conspicuously posted, and are printed on secure paper. Continued accreditation depends on successful ongoing participation in the Program. Consumers are urged to call (518) 485-5570 to verify the laboratory's accreditation status.



APPENDIX D

SAMPLE LOCATION PLANS



SCALE: 3/16"=1'-0"

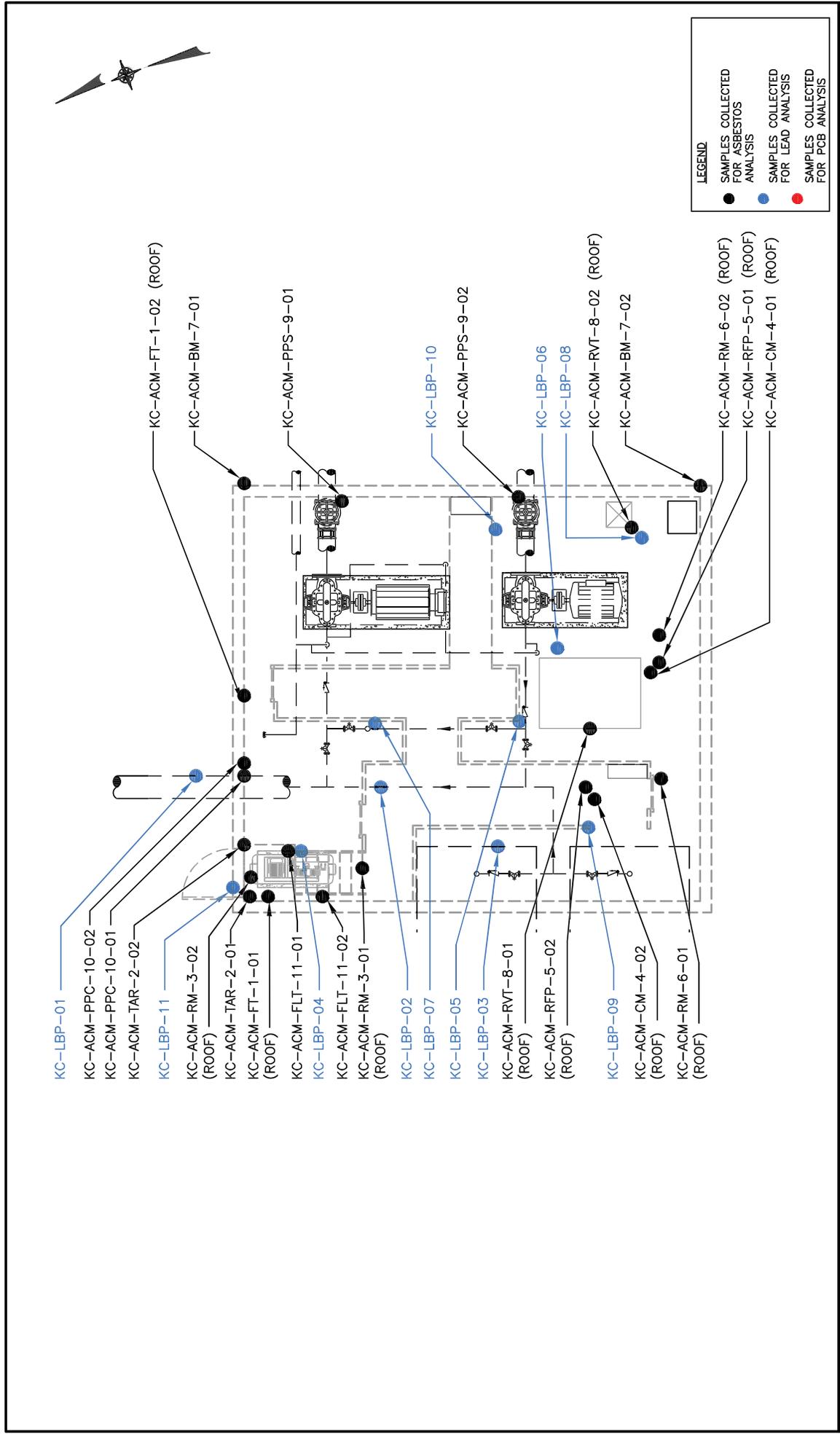
WESTCHESTER COUNTY AIRPORT

**HANGER D PUMP HOUSE
SAMPLE LOCATION PLAN**

FIGURE D-1



**D&B ENGINEERS
AND
ARCHITECTS, P.C.**

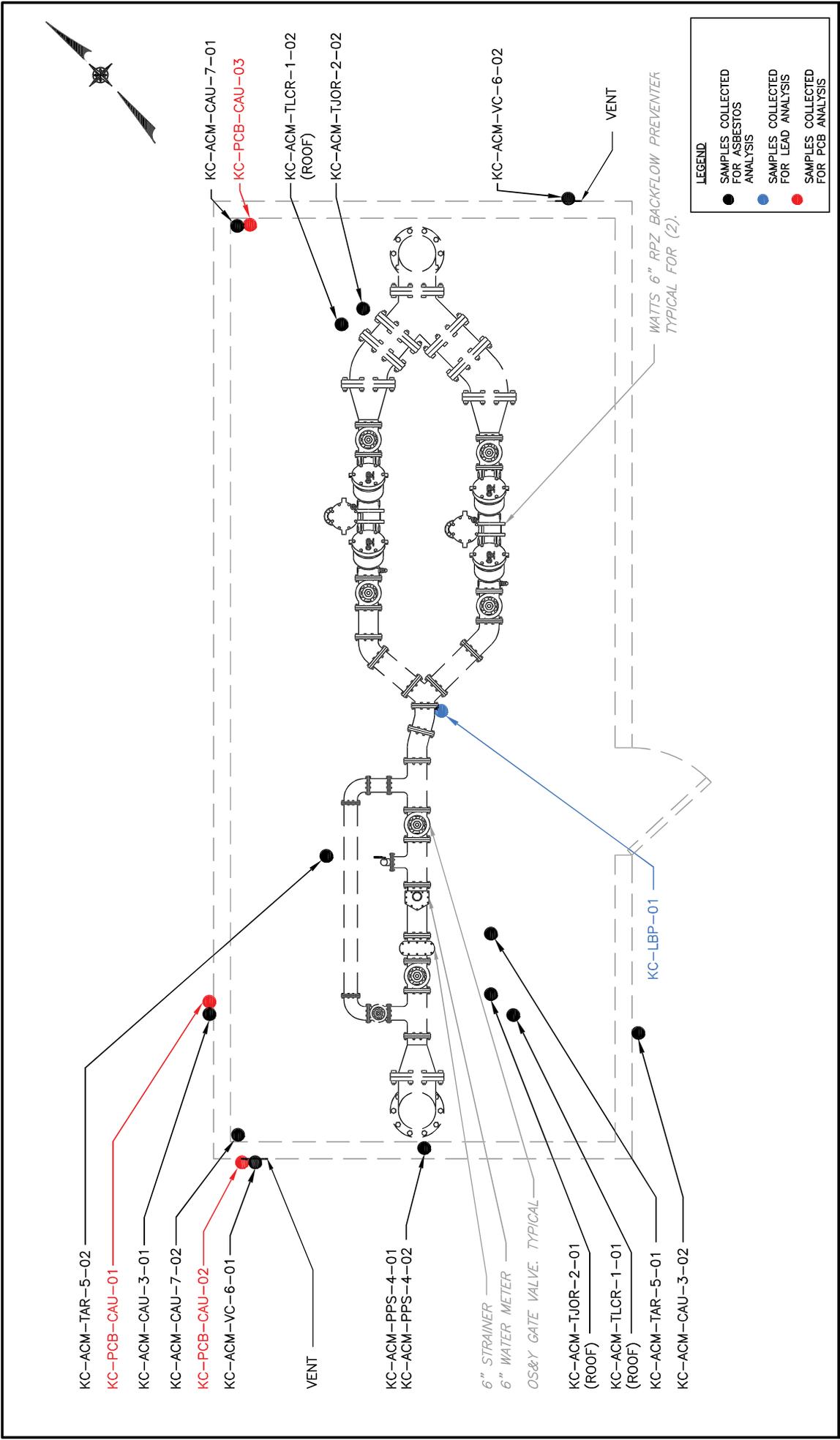


SCALE: 3/16"=1'-0"

FIGURE D-2

WESTCHESTER COUNTY AIRPORT
**HANGER E PUMP HOUSE
 SAMPLE LOCATION PLAN**





SCALE: 3/8"=1'-0"

WESTCHESTER COUNTY AIRPORT

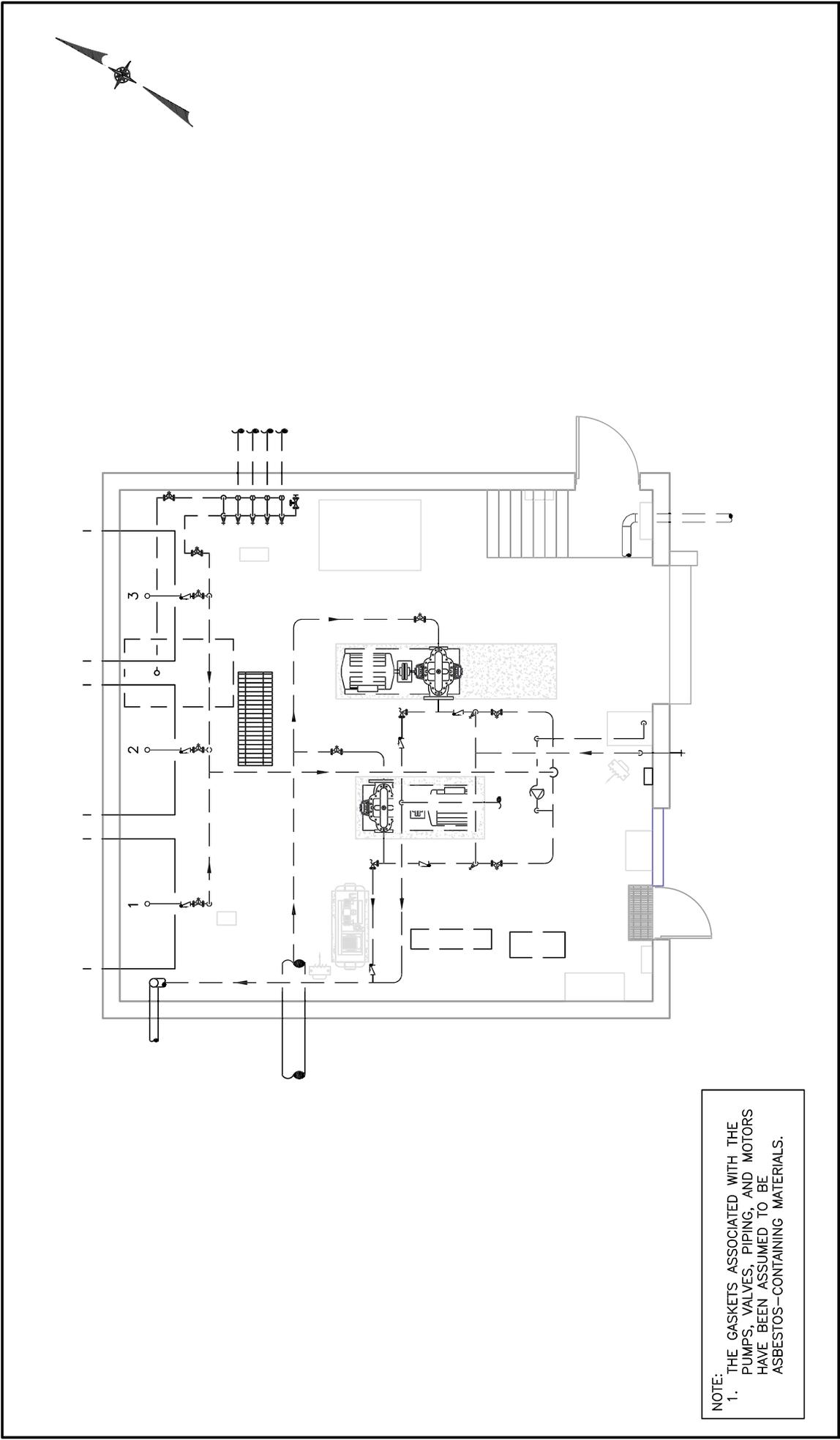
**TOWER ROAD BACKFLOW PREVENTOR BUILDING
SAMPLE LOCATION PLAN**

FIGURE D-3



APPENDIX E

ASBESTOS LOCATION PLANS



NOTE:
 1. THE GASKETS ASSOCIATED WITH THE PUMPS, VALVES, PIPING, AND MOTORS HAVE BEEN ASSUMED TO BE ASBESTOS-CONTAINING MATERIALS.

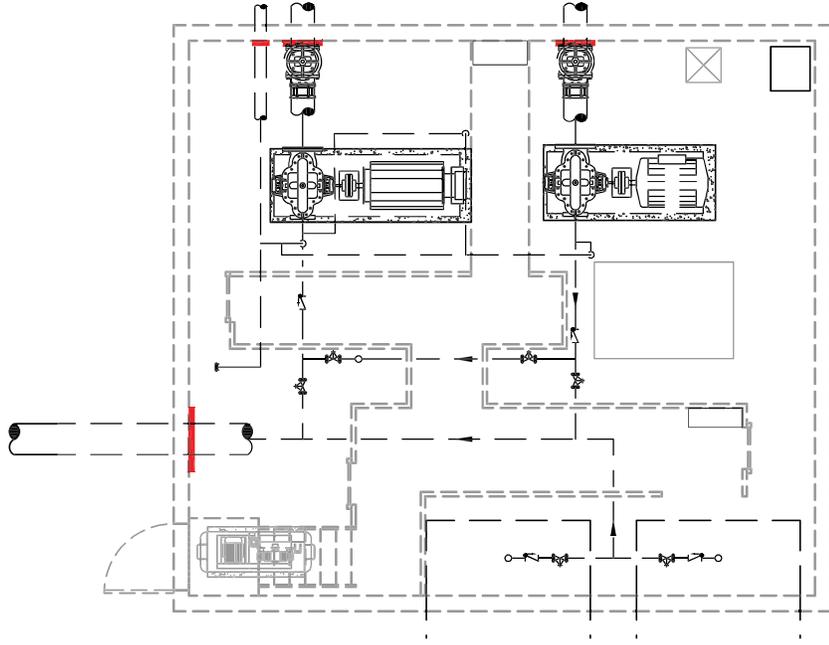
SCALE: 3/16"=1'-0"

FIGURE E-1

WESTCHESTER COUNTY AIRPORT

HANGER D PUMP HOUSE
 ASBESTOS-CONTAINING MATERIAL LOCATION PLAN





NOTE:
1. THE GASKETS ASSOCIATED WITH THE PUMPS, VALVES, PIPING, AND MOTORS HAVE BEEN ASSUMED TO BE ASBESTOS-CONTAINING MATERIALS.

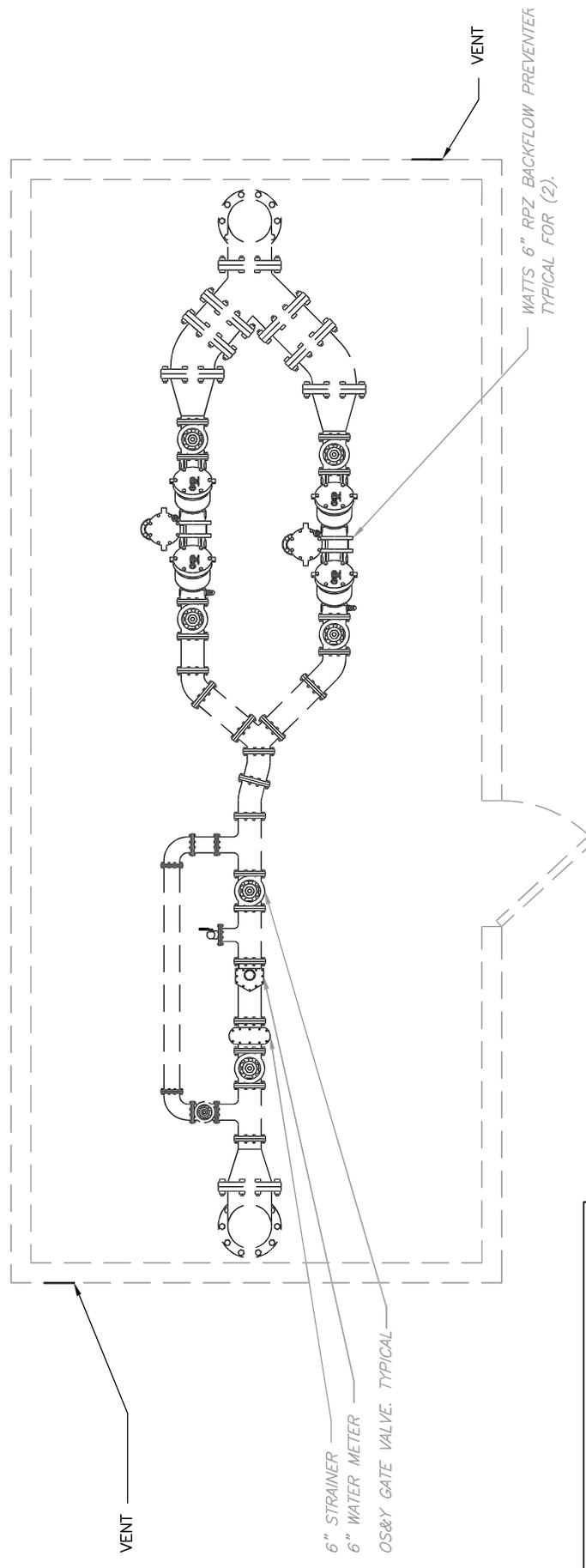
LEGEND:
— BLACK TAR PIPE
— PENETRATION SEALANT



WESTCHESTER COUNTY AIRPORT
HANGER E PUMP HOUSE
ASBESTOS-CONTAINING MATERIAL LOCATION PLAN

SCALE: 3/16"=1'-0"

FIGURE E-2



NOTE:
 1. THE GASKETS ASSOCIATED WITH THE PUMPS, VALVES, PIPING, AND MOTORS HAVE BEEN ASSUMED TO BE ASBESTOS-CONTAINING MATERIALS.



APPENDIX 7

DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
Division of Engineering

George Latimer
County Executive

Sherlita Amler, M.D.
Commissioner of Health

July 5, 2022

D&B Engineers and Architects
4 West Red Oak Lane, Suite 315
White Plains, NY 10604
Attn: Carolyn A. Lowe, P.E.

RE: File ID: C21-033
Approval of Plans for
Water Main Extension at
Westchester County Airport
North Castle (T)
Harrison (T)
PWS ID: 5903435

Dear Ms. Lowe:

Enclosed is an Approval of Plans for Water Supply Improvement issued this day and approved plans prepared by you consisting of Twenty (20) sheets, dated May 14, 2021, last revised April 15, 2022, for the above referenced project. This approval is issued pursuant to 10NYCRR Part 5, Subpart 5-1, Section 5-1.22 and Chapter 873, Article VII, Section 873.707.1, of the Laws of Westchester County.

The approval of Plans for Public Water Supply Improvement and approved plans should be filed in the appropriate office of The Town of Harrison and Town of North Castle. The applicant is obligated to comply with each of the conditions stipulated in this Approval of Plans for Public Water Supply Improvement.

Supervision of the construction by a licensed and registered professional engineer in the State of New York who will furnish a certificate of construction compliance to the Westchester County Department of Health is a responsibility of the applicant.

The certificate of construction compliance, including two (2) sets of As-Built plans and results of acceptable bacteriological analyses of water, and satisfactory pressure leakage tests (see conditions of approval) must be forwarded promptly to this office after completion of construction. Please note that an Approval of Completed Works, issued by the Westchester County Department of Health, is required before this construction may be put into service.

The approved plans call for the installation of approximately 2,670 linear feet of 12" class 52 ductile iron pipe, one (1) prefabricated Engineered Fluid, Inc. vault with one (1) 12-inch and one (1) 4-inch pressure reducing valve, seven (7) fire hydrants, and related appurtenances located at the Westchester County Airport, Harrison (T) and North Castle (T).

Very truly yours,



(for) Delroy Taylor, P.E.
Assistant Commissioner
Bureau of Environmental Quality

DT:ZT:KM
Enclosure

cc: Paul Kutzy, P.E. – Westchester Joint Water Works
Sal Misiti – North Castle Water Districts
Rocco Germani – Building Inspector, Harrison (T)
File



NEW YORK STATE DEPARTMENT OF HEALTH
 APPROVAL OF PLANS
 FOR PUBLIC WATER SUPPLY IMPROVEMENT

THIS APPROVAL IS ISSUED UNDER THE PROVISIONS OF 10 NYCRR, PART 5, SUBPART 5-1, SECTION 5-1.22 AND CHAPTER 873, Article VII, Section 873.707.1 OF THE WESTCHESTER COUNTY SANITARY CODE.

1. APPLICANT Westchester Joint Water Works	2. LOCATION OF WORKS Harrison (T), North Castle (T)	3. COUNTY Westchester	4. WATER DISTRICT -
5. TYPE OF PROJECT: <input type="checkbox"/> 1 Source <input type="checkbox"/> 3 Pumping Units <input type="checkbox"/> 5 Fluoridation <input checked="" type="checkbox"/> 7 Distribution <input type="checkbox"/> 2 Transmission <input type="checkbox"/> 4 Chlorination <input type="checkbox"/> 6 Other Treatment <input type="checkbox"/> 8 Storage <input type="checkbox"/> 9 Other			
REMARKS:- The approved plans call for the installation of approximately 2,670 linear feet of 12" class 52 ductile iron pipe, one (1) prefabricated Engineered Fluid, Inc. vault with one (1) 12-inch and one (1) 4-inch pressure reducing valve, seven (7) fire hydrants, and related appurtenances located at the Westchester County Airport, Harrison (T) and North Castle (T).			

By initiating improvement of the approved supply, the applicant accepts and agrees to abide by and conform with the following:

- a. THAT the proposed work be constructed in complete conformity with the plans and specifications approved this day or approved amendments thereto.
- b. THAT the proposed works not be placed into operation until such time as a Completed Works Approval is issued in accordance with Part 5 of the New York State Sanitary Code and Article VII, of the Westchester County Sanitary Code.
- c. THAT the proposed water distribution lines be disinfected in accordance with the AWWA Standard C651-05 except for Section 4.4.2, for disinfecting water mains.
- d. THAT two acceptable results of bacteriological analyses of water samples of water collected from the new distribution main after disinfection and before use of the mains at 24 hour intervals shall be submitted to the Westchester County Department of Health.
- e. THAT supervision of construction be by a licensed and registered professional engineer in the State of New York who shall furnish a certificate of construction compliance and two (2) sets of AS-Built plans after completion of construction.
- f. THAT the Department must be notified 48 hours prior to the Pressure Test in order for a representative to verify such test.
- g. THAT this approval is valid for one (1) year.
- h. THAT any temporary water mains installed during construction of the above mentioned water supply improvements shall not be placed into service until the temporary piping installed is disinfected in accordance with AWWA Standard C651-05 except Section 4.4.2, and until acceptable bacteriological test results are accepted by this Department.
- i. THAT a request for an extension of the expiration date of this permit must be received by this department before the permit's expiration date. Request received after the permit has expired will not be considered.
- j. THAT the facilities shall not be placed in operation until the proposed easement for the owner of utility, Westchester Joint Water Works, has been recorded with the Westchester County Land Records and that the Department has accepted the recorded document.

ISSUED FOR THE STATE COMMISSIONER OF HEALTH

July 5, 2022

DATE



DESIGNATED REPRESENTATIVE
 Delroy Taylor, P.E.
 Assistant Commissioner
 Bureau of Environmental Quality

(jpe)

GENERAL

6. Type of Ownership: Westchester County

- Municipal Commercial 68 Private Other 1 Authority 30 Interstate
 Industrial Corp. Water Works Private Institutional 9 Federal 40 International Corp.
 26 Board of Education 20 State 18 Indian Reservation

7. Estimated Total Cost

\$8,830,000.00

8. Population Served

59,629

9. Drainage Basin

Long Island Sound

10. Federal Aid Involved?

 YES NO

11. WSA Project?

 YES NO**SOURCE**

12.

SURFACE Name _____ Class _____

GROUND Name _____ Class _____

13. Estimated Source

Development Cost

14. Safe Yield:

GPD

15. Description

TREATMENT

16. Type of Treatment

- 1 Alteration 5 Clarifiers 9 Fluoridation
 2 Microstrainers 6 Filtration 10 Softening
 3 Mixing 7 Iron Removal 11 Corrosion Control
 4 Sedimentation 8 Chlorination 12 Other U.V.

17. Name of Treatment Works

18. Max. Treat. Cap.

19. Grade of Plant
Operator Req.

20. Est. Cost

\$

21. Description:

DISTRIBUTION

22. Type of Project

- 1 Cross Connection 3 Transmission
 2 Interconnection 4 Fire Pump Chl.

23. Type of Storage

Elevated _____ gal.
Underground _ gal.

24. Est. Cost

Distribution
\$8,000,000.00

25. Anticipated Distribution

System Demand: Avg. 13.8 MGD Max. 24.7 MGD

26. Designed For Fire Flow

 YES NO

27. Description:

See Item #5



George Latimer
County Executive

Sherlita Amler, M.D.
Commissioner of Health

July 5, 2022

D&B Engineers and Architects
4 West Red Oak Lane, Suite 315
White Plains, NY 10604
Attn: Carolyn A. Lowe, P.E.

RE: File ID: C21-034
Approval of Plans for
Water Main Extension at
New King Street
Harrison (T)

Dear Ms. Lowe:

Enclosed is an Approval of Plans for Water Supply Improvement issued this day and approved plans prepared by you consisting of Twenty (20) sheets, dated May 14, 2021, last revised April 15, 2022, for the above referenced project. This approval is issued pursuant to 10NYCRR Part 5, Subpart 5-1, Section 5-1.22 and Chapter 873, Article VII, Section 873.707.1, of the Laws of Westchester County.

The approval of Plans for Public Water Supply Improvement and approved plans should be filed in the appropriate office of The Town of North Castle. The applicant is obligated to comply with each of the conditions stipulated in this Approval of Plans for Public Water Supply Improvement.

Supervision of the construction by a licensed and registered professional engineer in the State of New York who will furnish a certificate of construction compliance to the Westchester County Department of Health is a responsibility of the applicant.

The certificate of construction compliance, including two (2) sets of As-Built plans and results of acceptable bacteriological analyses of water, and satisfactory pressure leakage tests (see conditions of approval) must be forwarded promptly to this office after completion of construction. Please note that an Approval of Completed Works, issued by the Westchester County Department of Health, is required before this construction may be put into service.

The approved plans call for the installation of approximately 1,390 linear feet of 12" class 52 ductile iron pipe, two (2) fire hydrants, and related appurtenances, located in New King Street, North Castle (T).

Very truly yours,

(for)

Delroy Taylor, P.E.
Assistant Commissioner
Bureau of Environmental Quality

DT:ZT:KM
Enclosure

cc: Sal Misiti – North Castle Water Districts
Paul Kutzy, P.E. – Westchester Joint Water Works
Rocco Germani – Building Inspector, Harrison (T)
File

Department of Health
25 Moore Avenue
Mount Kisco, New York 10519

Telephone: (914) 864-7318

Fax: (914) 813-4691



NEW YORK STATE DEPARTMENT OF HEALTH
APPROVAL OF PLANS
FOR PUBLIC WATER SUPPLY IMPROVEMENT

THIS APPROVAL IS ISSUED UNDER THE PROVISIONS OF 10 NYCRR, PART 5, SUBPART 5-1, SECTION 5-1.22 AND CHAPTER 873, Article VII, Section 873.707.1 OF THE WESTCHESTER COUNTY SANITARY CODE.

1. APPLICANT Town of North Castle	2. LOCATION OF WORKS Harrison (T), North Castle (T)	3. COUNTY Westchester	4. WATER DISTRICT Future North Castle Water District #8
<p>5. TYPE OF PROJECT:</p> <p>() 1 Source () 3 Pumping Units () 5 Fluoridation (X) 7 Distribution</p> <p>() 2 Transmission () 4 Chlorination () 6 Other Treatment () 8 Storage () 9 Other</p> <p>REMARKS: The approved plans call for the installation of approximately 1,390 linear feet of 12" class 52 ductile iron pipe, two (2) fire hydrants, and related appurtenances, located in New King Street, North Castle (T).</p>			

By initiating improvement of the approved supply, the applicant accepts and agrees to abide by and conform with the following:

- a. **THAT** the proposed work be constructed in complete conformity with the plans and specifications approved this day or approved amendments thereto.
- b. **THAT** the proposed works not be placed into operation until such time as a Completed Works Approval is issued in accordance with Part 5 of the New York State Sanitary Code and Article VII, of the Westchester County Sanitary Code.
- c. **THAT** the proposed water distribution lines be disinfected in accordance with the AWWA Standard C651-05 except for Section 4.4.2, for disinfecting water mains.
- d. **THAT** two acceptable results of bacteriological analyses of water samples of water collected from the new distribution main after disinfection and before use of the mains at 24 hour intervals shall be submitted to the Westchester County Department of Health.
- e. **THAT** supervision of construction be by a licensed and registered professional engineer in the State of New York who shall furnish a certificate of construction compliance and two (2) sets of AS-Built plans after completion of construction.
- f. **THAT** the Department must be notified 48 hours prior to the Pressure Test in order for a representative to verify such test.
- g. **THAT** this approval is valid for one (1) year.
- h. **THAT** any temporary water mains installed during construction of the above mentioned water supply improvements shall not be placed into service until the temporary piping installed is disinfected in accordance with AWWA Standard C651-05 except Section 4.4.2, and until acceptable bacteriological test results are accepted by this Department.
- i. **THAT** a request for an extension of the expiration date of this permit must be received by this department before the permit's expiration date. Request received after the permit has expired will not be considered.

ISSUED FOR THE STATE COMMISSIONER OF HEALTH

July 5, 2022

DATE



DESIGNATED REPRESENTATIVE

Delroy Taylor, P.E.

Assistant Commissioner

Bureau of Environmental Quality

(for)

GENERAL

6. Type of Ownership: Westchester County

Municipal Commercial 68 Private Other 1 Authority 30 Interstate
 Industrial Corp. Water Works Private Institutional 9 Federal 40 International Corp.
 26 Board of Education 20 State 18 Indian Reservation

7. Estimated Total Cost

\$2,210,000.00

8. Population Served

> 101

9. Drainage Basin

Long Island Sound

10. Federal Aid Involved?

 YES NO

11. WSA Project?

 YES NO**SOURCE**

12.

SURFACE Name _____ Class _____

GROUND Name _____ Class _____

13. Estimated Source

Development Cost

14. Safe Yield:

GPD

15. Description

TREATMENT

16. Type of Treatment

1 Alteration 5 Clarifiers 9 Fluoridation
 2 Microstrainers 6 Filtration 10 Softening
 3 Mixing 7 Iron Removal 11 Corrosion Control
 4 Sedimentation 8 Chlorination 12 Other U.V.

17. Name of Treatment Works

18. Max. Treat. Cap.

19. Grade of Plant
Operator Req.

20. Est. Cost

\$

21. Description:

DISTRIBUTION

22. Type of Project

1 Cross Connection 3 Transmission
 2 Interconnection 4 Fire Pump Chl.

23. Type of Storage

Elevated ____ gal.
Underground _ gal.

24. Est. Cost

Distribution
\$2,000,000.00

25. Anticipated Distribution

System Demand: Avg. 0.05 MGD Max. ____ MGD

26. Designed For Fire Flow

 YES NO

27. Description:

See Item #5



George Latimer
County Executive

Sherlita Amler, MD
Commissioner of Health

July 5, 2022

OLA Consulting Engineers
50 Broadway
Hawthorne, NY 10532
Attn: Barbara J. Walsh, P.E.

RE: Log #: 13503-22-RPZ(2)
Application for Backflow Prevention Device
Westchester County Airport
Tower Rd & Purchase St Intersection
White Plains (C)

Dear Ms. Walsh:

The plans and specifications for the above project have been reviewed and approved by this office pursuant to the provisions of Chapter 873, Article VII, Section 873.707.1 of the Laws of Westchester and Section 5-1.31, Subpart 5-1, of Part 5 of the New York State Sanitary Code.

A Certificate of Approval is attached.

Form NYSDOH-1013 is to be utilized as a Request for Completed Works Approval. This form can be downloaded from the following link:

https://health.westchestergov.com/images/stories/pdfs/crossconnection_doh1013.pdf.

NYSDOH- 1013 consists of two parts: (A) the initial test of the device(s) by a certified backflow prevention device tester, and (B) a certification by a Professional Engineer or Registered Architect, licensed and registered in the State of New York that installation is in accordance with the approved plans. The completed NYSDOH-1013 must be sent to our Department within 45 days of installation of the device(s). This form can be emailed to DOH-BFlow@westchestergov.com.

Respectfully,

Delroy Taylor, P.E.
Assistant Commissioner
Bureau of Environmental Quality

DT:KM

cc: Hugh J. Greechan, Commissioner – Westchester County DPW
Damon Amodio – Building Inspector, White Plains (C)
Joe Webb – Westchester Joint Water Works
Paul Kutzy – Westchester Joint Water Works
File



NEW YORK STATE DEPARTMENT OF HEALTH
 CERTIFICATE OF APPROVAL
 FOR BACKFLOW PREVENTION DEVICES

This approval is issued under the provisions of 10 NYCRR, Part 5, Section 5-1.31, and Chapter 873, Article VII, Section 873.707.1 of the Laws of Westchester County.

		Log No.	13502-22-RPZ(2)
Facility: Westchester County Airport, 240 Airport Rd		City, Village, Town: White Plains (C)	County: WESTCHESTER
Owner's Mailing Address: Department of Public Works 148 Martine Avenue White Plains NY, 10601			
Physical Location of Backflow Prevention Device(s): Intersection of Tower Road & Purchase Street			
Description of Device(s): Two (2) 10" Watts LF909M1 RPZ devices			
Water Supplier: Westchester Joint Water Works			
Name Designated Representative: Joseph Webb			
Mailing Address: 1625 Mamaroneck Ave, Mamaroneck			Zip: 10543

Conditions of Approval:

- A. THAT the device(s) shall be installed within 90 days, and that within 45 days of installation the attached New York State Department of Health Form DOH-1013 shall be completed and returned to the water supplier and the Westchester County Department of Health.
- B. THAT a certified backflow prevention device tester test the above backflow prevention device(s) at least yearly and report the results to the water purveyor indicated above.
- C. THAT any connection made prior to the backflow prevention device(s) shall render this approval void.
- D. THAT the proposed works be constructed in conformance with plans and specifications approved this day and any amendments thereto.
- E. THAT certification that installation of device(s) is in accordance with the approved plans, Form NYSDOH-1013, Part B, must be completed by a Professional Engineer or Registered Architect, licensed and registered in the State of New York.
- F. THAT the approved device(s) shall be so set that the test cocks are faced for easy access.
- G. THAT if facility construction has not commenced within 90 days of the issuance of this Certificate of Approval, then this Certificate shall become null and void unless an extension to the 90 day installation period is secured from the Westchester County Department of Health by the facility owner.

Designated Representative



 Delroy Taylor, P.E.
 Assistant Commissioner

ISSUED FOR THE STATE COMMISSIONER OF HEALTH BY:

DATE: July 5, 2022



George Latimer
County Executive

Sherlita Amler, MD
Commissioner of Health

July 5, 2022

OLA Consulting Engineers
50 Broadway
Hawthorne, NY 10532
Attn: Barbara J. Walsh, P.E.

RE: Log #: 13502-22-RPZ(2)
Application for Backflow Prevention Device
Westchester County Airport
Airport Road & Tower Road Intersection
White Plains (C)

Dear Ms. Walsh:

The plans and specifications for the above project have been reviewed and approved by this office pursuant to the provisions of Chapter 873, Article VII, Section 873.707.1 of the Laws of Westchester and Section 5-1.31, Subpart 5-1, of Part 5 of the New York State Sanitary Code.

A Certificate of Approval is attached.

Form NYSDOH-1013 is to be utilized as a Request for Completed Works Approval. This form can be downloaded from the following link:

https://health.westchestergov.com/images/stories/pdfs/crossconnection_doh1013.pdf.

NYSDOH- 1013 consists of two parts: (A) the initial test of the device(s) by a certified backflow prevention device tester, and (B) a certification by a Professional Engineer or Registered Architect, licensed and registered in the State of New York that installation is in accordance with the approved plans. The completed NYSDOH-1013 must be sent to our Department within 45 days of installation of the device(s). This form can be emailed to DOH-BFlow@westchestergov.com.

Respectfully,

Delroy Taylor, P.E.
Assistant Commissioner
Bureau of Environmental Quality

DT:KM

cc: Hugh J. Greechan, Commissioner – Westchester County DPW
Damon Amodio – Building Inspector, White Plains (C)
Joe Webb – Westchester Joint Water Works
Paul Kutzy – Westchester Joint Water Works
File



**NEW YORK STATE DEPARTMENT OF HEALTH
 CERTIFICATE OF APPROVAL
 FOR BACKFLOW PREVENTION DEVICES**

This approval is issued under the provisions of 10 NYCRR, Part 5, Section 5-1.31, and Chapter 873, Article VII, Section 873.707.1 of the Laws of Westchester County.

	Log No.	13502-22-RPZ(2)
Facility: Westchester County Airport, 240 Airport Rd	City, Village, Town: White Plains (C)	County: WESTCHESTER
Owner's Mailing Address: Department of Public Works 148 Martine Avenue White Plains NY, 10601		
Physical Location of Backflow Prevention Device(s): Intersection of Airport Road & New King Street		
Description of Device(s): Two (2) 10" Watts LF909M1 RPZ devices		
Water Supplier: Westchester Joint Water Works		
Name Designated Representative: Joseph Webb		
Mailing Address: 1625 Mamaroneck Ave, Mamaroneck		Zip: 10543

Conditions of Approval:

- A. THAT the device(s) shall be installed within 90 days, and that within 45 days of installation the attached New York State Department of Health Form DOH-1013 shall be completed and returned to the water supplier and the Westchester County Department of Health.
- B. THAT a certified backflow prevention device tester test the above backflow prevention device(s) at least yearly and report the results to the water purveyor indicated above.
- C. THAT any connection made prior to the backflow prevention device(s) shall render this approval void.
- D. THAT the proposed works be constructed in conformance with plans and specifications approved this day and any amendments thereto.
- E. THAT certification that installation of device(s) is in accordance with the approved plans, Form NYSDOH-1013, Part B, must be completed by a Professional Engineer or Registered Architect, licensed and registered in the State of New York.
- F. THAT the approved device(s) shall be so set that the test cocks are faced for easy access.
- G. THAT if facility construction has not commenced within 90 days of the issuance of this Certificate of Approval, then this Certificate shall become null and void unless an extension to the 90 day installation period is secured from the Westchester County Department of Health by the facility owner.

Designated Representative

ISSUED FOR THE STATE COMMISSIONER OF HEALTH BY:

DATE: July 5, 2022



 Delroy Taylor, P.E.
 Assistant Commissioner