TOWN OF STRATFORD
Stratford Town Hall, 2725 Main Street, Stratford, CT 06615
Phone: 203-385-4045 | Fax: 203-385-4046
Email: purchasing@townofstratford.com | www.townofstratford.com
PURCHASING DEPARTMENT

BID #2026-15
FLOOD PROTECTION PROJECT
WATER POLLUTION CONTROL FACILITY

SEALED submissions are subject to the standard instructions set forth on the attached sheets. Any modifications must be specifically accepted by the Town of Stratford.

Released: *Wednesday, 4th February, 2026*

Phillip Ryan, Purchasing Agent

Bidder:

_____
Doing Business As (Trade Name)

_____
Address

_____
Town / State / Zip

_____
Title (Mr /Ms)

_____
Signature

_____
Telephone

_____
E-mail

Sealed bids will be received by the Purchasing Department at the office of the Purchasing Agent, 2725 Main Street, Room 104, Stratford, Connecticut 06615, up to:

10:00AM, Wednesday, 11th March, 2026

NOTE:

1. Bidders are to complete all requested data in the upper right corner of this page and must return this page with their bid proposal.
2. No bid shall be accepted from, or contracts awarded to, any person/company who is in arrears to the Town of Stratford upon debt, or contract or who has been within the prior five (5) years, a defaulter as surety or otherwise upon obligations to the Town of Stratford.
3. Submissions are to be submitted in a sealed envelope and clearly marked "BID #2026-15" on the outside of the envelope, including all outer packaging, such as, DHL, FedEx, UPS, etc.

INVITATION TO BID

The Town of Stratford ("Town") is seeking competitive bids from qualified contractors with proven industry experience to provide labor, materials, tools, equipment, and all else necessary, to perform the work as delineated in the Contract Documents prepared by GZA, 144 Elm Street, Amesbury, MA 01913.

1. Performance bond covering 100% of the contract price is required for contracts over $100,000.00 (C.G.S. 49-41).
2. CT-DEEP CWF / DHS-FEMA is an Affirmative Action, Equal Opportunity Employer.
3. It is a requirement of all contractors and subcontractors for affirmative action to ensure equal opportunity for employment as noted under Executive Order No. Three.
4. Project is paid for in part by CT-DEEP/CWF and provided by FEMA Pre-Disaster Mitigation Program (PDM).
5. Contractors must comply with State Prevailing Fair Wage Provisions (for new construction projects over $1,000,000.00 and remodel/repair projects over $100,000.00 – C.G.S. 31-53(g)).
6. Contractor must comply with DAS Contractor Prequalification requirements (>$1,000,000.00).
7. Town shall provide access to the site and project records at reasonable times for DEEP or authorized representatives.

PRE-BID MEETING

A non-mandatory pre-bid conference on Tuesday, 17th February, 2026 at 1:30PM will begin at Water Pollution Control Facility, 105 Beacon Point Road, Stratford for prospective bidders to scope the conditions.

- While the meeting is not mandatory, prospective bidders are encouraged to attend and will be required to sign-in at commencement of the meeting. The sign-in sheet will be posted on the Purchasing Department website as below. Copies will not be made available at the meeting, nor will they be distributed by fax or email.
- All requests for information will be answered in writing as specified below under RFI / Addenda.

REQUESTS FOR INFORMATION (RFI) / ADDENDA

Direct requests in writing to: Town of Stratford, Purchasing Department
Attention: Phillip Ryan, Purchasing Agent
E-mail: PRyan@townofstratford.com

NOTE: Written requests for information will not be accepted after 12:00PM on Wednesday, 25th February, 2026.

Response will be in the form of an addendum that will be posted approximately Wednesday, 4th March, 2026 at the close of business to the Purchasing Department website: https://www.stratfordct.gov/page/purchasing-department

It is the responsibility of each bidder to retrieve addenda from the website. Any contact about this bid between a Bidder and any other Town official and/or department manager and/or Town of Stratford employee, other than as set forth above, may be grounds for disqualification of that Bidder. No questions or clarifications shall be answered by phone, in person or in any other manner than specified above. Addenda will not be mailed, e-mailed or faxed out.

BID BOND / BID SECURITY

A five (5) percent bid bond or equal approved security as stated per the Terms and Conditions must be submitted with the proposal. Any bid submitted without such security will be excluded from the bidding process. No exceptions.

CHECKLIST

The following must be submitted with proposal:

- ☐ Cover page, completed and signed.
- ☐ Bid Form(s)
- ☐ Addenda acknowledged on Bid Form, or submitted if requested.
- ☐ Bid Bond or Equal Approved Security.
- ☐ Insurance Procedure.
- ☐ Non-Collusion Affidavit
- ☐ AIA Document A305 – Contractor's Qualification Statement.
- ☐ List of five (5) equivalent projects completed within the last three (3) years. (Include project and reference contact information for each.)
- ☐ List of all subcontractors identifying each trade, hourly rates, location, and Tax ID number.
- ☐ Identify any exceptions that may apply. These must be itemized and attached to the proposal form.
- ☐ Contractor Prequalification Statement.
- ☐ Update Bid Statement.
- ☐ W9 Form.

The Bidder hereby certifies that any and all defects, errors, inconsistencies or omissions of which he/she is aware, either directly or by notification from any material supplier found in the Contract Documents are listed herewith in this Bid Form.

Name _____ Title _____ Signature _____ Date_____

TOWN OF STRATFORD
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Phone: 203-385-4045 | Fax: 203-385-4046
Email: purchasing@townofstratford.com | www.townofstratford.com
PURCHASING DEPARTMENT

BID #2026-15

FLOOD PROTECTION PROJECT
WATER POLLUTION CONTROL FACILITY

INVITATION TO BID

Sealed bids for the construction of Bid Number 2026-15 "Flood Protection Project" will be received by Phillip Ryan, Purchasing Agent, Stratford Town Hall, 2725 Main Street, Room 104, Stratford, CT 06615 until 10:00AM. on Wednesday, 11th March, 2026 at which time the bids received will be publicly opened and read. All sealed bids must have outer envelope marked as "2026-15 Flood Protection Project".

A non-mandatory pre-bid conference on Tuesday, 17th February, 2026 at 1:30PM will begin at the Water Pollution Control Facility, 105 Beacon Point Road, Stratford, CT 06615.

The work will entail removal of existing stone riprap, excavation to approximately 3-4' depth, drilling micropiles, forming and pouring concrete pile caps and concrete walls, placement of fill for earthen embankment, installation gabion wall, reinstallation of stone riprap, and restoration of site. The total length of flood protection is 3,100 linear feet.

On Wednesday, 4th February, 2026 the Bidding Documents may be obtained online from the Town of Stratford website located at https://www.stratfordct.gov/page/purchasing-department

Funding:

- Connecticut Department of Energy & Environmental Protection (CT-DEEP) - Clean Water Fund (CWF).
- Department of Emergency Services & Public Protection – Division of Emergency Management & Homeland Security. DEMHS Grant No: PDMC-PJ-01-CT-2017-006. Fed Grant No: EMB-2018-PC-0005.

Any contract or contracts awarded under this invitation for bids are expected to be funded in part by the State of Connecticut (Department of Energy and Environmental Protection). Neither the State of Connecticut nor any of its departments, agencies, or employees is or will be a party to this invitation for bids or any resulting contract. This procurement will be subject to the requirements contained in Section 22a-482-4 (h), (j), and (o) of the regulations of Connecticut State Agencies, which are included as an attachment to Section 00800, Supplementary Conditions.

All applicable Federal, State and local laws, rules and regulations of all authorities having jurisdiction over the locality of the project shall apply to the contract and are deemed to be included herein**.** If the total amount of the project, including any current or future change orders, exceeds $100,000.00 all work is to be done in accordance with Connecticut Department of Labor (CT-DOL) rules and regulations. More information may be obtained from: www.ctdol.state.ct.us

The Davis-Bacon and Related Acts, shall apply to contractors and subcontractors performing on federally funded or assisted contracts in excess of $2,000.00 for the construction, alteration, or repair (including painting and decorating) of public buildings or public works. More information may be obtained from: https://www.dol.gov/whd/govcontracts/dbra.htm

NOTE: The Town shall apply the most current wage decision applicable at the time of contract award.

Minimum Wage Rates as determined by the Connecticut Department of Labor under the provision of the Connecticut General Statutes, Title 31, §53, latest revision (the "Act") apply to this project. It is the responsibility of the Contractor, before bid opening, to request, if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed Work under this Contract.

Disadvantaged Business Enterprise (DBE) goals are applicable to the total dollars paid to the construction contract. The goals imposed by the Connecticut DEEP for this project are a minimum of 3.00 percent for Minority Business Enterprise (MBE) participation and 5.00 percent for Women's Business Enterprise (WBE) participation by certified DBEs. The Bidder shall submit the required DEEP acknowledgement form, which is provided in the bid documents, with their bid. Failure to comply with the requirements of this paragraph may be deemed to render a proposal non-responsive.

It is a requirement of all contractors and subcontractors for affirmative action to ensure equal opportunity for employment as noted under Executive Order No. Three.

All Bidders shall furnish with their bid a bid deposit in the form of a bid bond in the amount of 5% of the total amount of the bid and made payable to the Town of Stratford, CT. Performance and Payment Bonds, in the full amount of the Contract price, will be required of the Successful Bidder.

Bidders shall be Department of Administrative Services (DAS) pre-qualified under the category of "Water Treatment Plants". Bidders are advised that both the DAS Prequalification Certificate and Update (Bid) Statement must accompany the bid proposal. Failure to supply these forms with the bid will result in rejection of the bid.

The project is subject to the American Iron and Steel (AIS) requirement of Section 436 of Public Law (P.L.) 113-76, Consolidated Appropriations Act, 2014, which requires that all of the iron and steel products used in the project are produced in the United States. Section 00800 contains further information on applicable iron and steel products and compliance.

The Town of Stratford ("Town") reserves the right to waive any informality in or to reject any or all bids, or to accept any bid which in its opinion, is in the public interest to do so.

No bid may be withdrawn within 120 days after the date of the opening of bids.

Consulting Engineer:
GZA | 144 Elm Street | Amesbury | MA 01913

END OF SECTION

SECTION 00300

BID FORM

The undersigned, as a bidder, declares that he/she has carefully examined the location of the proposed work, the proposed form of Agreement, and Contract Documents, and he/she proposes and agrees that, if this bid is accepted, he/she will contract with the Owner to provide all necessary machinery, tools and apparatus, to do all the work and furnish all the materials specified in the Contract Documents in the manner and time therein set forth required to complete the

BID #2026-15

WATER POLLUTION CONTROL FACILITY FLOOD PROTECTION SYSTEM IMPROVEMENTS

TOWN OF STRATFORD, CONNECTICUT

The work to be performed pursuant to this Bid shall be in strict conformity with the Contract Documents prepared therefore by the Owner, copies of which are on file in the Department of Public Works/Engineering Office, which Contract Documents are hereby made a part thereof, and incorporated by this reference as is fully set forth herein.

The following Bid Pricing Summary reflects the respective bid item breakdowns indicated in Tables 1, 2, 3, and 4:

1. The TOTAL BASE BID PRICE (Table 1 - Base Bid Total) is:

   _____Dollars

   ($_____)

   (insert words and numbers. In cases of conflict between words and numbers, words shall control)

2. The TOTAL ADD ALTERNATE 1 BID PRICE (Table 2 – Add Alternate 1 Bid Total) is:

   _____Dollars

   ($_____)

   (insert words and numbers. In cases of conflict between words and numbers, words shall control)

3. The TOTAL ADD ALTERNATE 2 BID PRICE (Table 3 – Add Alternate 2 Bid Total) is:

   _____Dollars

   ($_____)

   (insert words and numbers. In cases of conflict between words and numbers, words shall control)

4. The TOTAL ADD ALTERNATE 3 BID PRICE (Table 4 – Add Alternate 3 Bid Total) is:

_____Dollars

($_____)

(insert words and numbers. In cases of conflict between words and numbers, words shall control)

5. The TOTAL BASE BID PLUS ADD ALTERNATE 1 BID PRICE (Table 1 + Table 2) is:

_____Dollars

($_____)

(insert words and numbers. In cases of conflict between words and numbers, words shall control)

6. The TOTAL BASE BID PLUS ADD ALTERNATE 1 AND 2 BID PRICE (Table 1+Table 2+Table 3) is:

_____Dollars

($_____)

(insert words and numbers. In cases of conflict between words and numbers, words shall control)

7. The TOTAL BASE BID PLUS ADD ALTERNATE 1, 2, AND 3 BID PRICE (Table 1+Table 2+Table 3+Table 4) is:

_____Dollars

($_____)

(insert words and numbers. In cases of conflict between words and numbers, words shall control)

The unit prices for items comprising the contract are further defined as follows:

TABLE 1 – BASE BID				
ITEM NO.	QUANTITY	ITEM OF WORK WITH UNIT PRICE WRITTEN IN WORDS	UNIT PRICE	TOTAL PRICE
01100.1	1 LS	Utility Coordination, Locating, Clearance, and Verification at_____ _____ Dollars & Cents/Lump Sum		
01500.1	1 LS	Temporary Facilities at_____ _____ Dollars & Cents/Lump Sum		
01560.1	1 LS	Temporary Erosion and Sediment Control at_____ _____ Dollars & Cents/Lump Sum		
01900.1	1 LS	Mobilization/Demobilization at_____ _____ Dollars & Cents/Lump Sum		
02065.1	65 LF	Buried Pipe Removal at_____ _____ Dollars & Cents/Linear Foot		
02065.2	250 Ton	Unclassified Material Disposal at_____ _____ Dollars & Cents/Ton		
02110.1	1 LS	Clearing, Grubbing, and Stripping at_____ _____ Dollars & Cents/Lump Sum		
02300.1	1,600 CY	Impervious Fill at_____ _____ Dollars & Cents/Cubic Yard		

TABLE 1 – BASE BID				
ITEM NO.	QUANTITY	ITEM OF WORK WITH UNIT PRICE WRITTEN IN WORDS	UNIT PRICE	TOTAL PRICE
02300.2	350 CY	Processed Aggregate Base Course at_____ _____ Dollars & Cents/Cubic Yard		
02300.3	2,950 CY	No. 4 Crushed Stone at_____ _____ Dollars & Cents/Cubic Yard		
02300.4	1,100 CY	Granular Fill at_____ _____ Dollars & Cents/Cubic Yard		
02300.5	630 SY	Geotextile Fabric at_____ _____ Dollars & Cents/Square Yard		
02315.1	280 Ton	PCB Impacted Soil at_____ _____ Dollars & Cents/Ton		
02315.2	100 Ton	Contaminated Soil at_____ _____ Dollars & Cents/Ton		
02315.3	100 Ton	Polluted Soil at_____ _____ Dollars & Cents/Ton		
02373.1	5,825 CY	Riprap Slope Protection at_____ _____ Dollars & Cents/Cubic Yard		

TABLE 1 – BASE BID				
ITEM NO.	QUANTITY	ITEM OF WORK WITH UNIT PRICE WRITTEN IN WORDS	UNIT PRICE	TOTAL PRICE
02375.1	432 CY	Gabion Wall at_____ _____ Dollars & Cents/Cubic Yard		
02465.1	1 EA	Augercast Pile Load Test and Reporting – 24" Diameter at_____ _____ Dollars & Cents/Each		
02465.2	18,104 LF	Augercast Piles – 24" Diameter at_____ _____ Dollars & Cents/Linear Foot		
02475.1	1 EA	Drilled Micropile Load Test and Reporting – 12.75" Diameter at_____ _____ Dollars & Cents/Each		
02475.2	16,490 LF	Drilled Micropiles – 12.75" Diameter at_____ _____ Dollars & Cents/Linear Foot		
02510.1	1,125 SY	Bituminous Concrete Pavement - Removal at_____ _____ Dollars & Cents/Square Yard		
02510.2	890 LF	Bituminous Concrete Curb - Removal at_____ _____ Dollars & Cents/Linear Foot		
02510.3	760 SY	Bituminous Concrete Pavement at_____ _____ Dollars & Cents/Square Yard		

TABLE 1 – BASE BID				
ITEM NO.	QUANTITY	ITEM OF WORK WITH UNIT PRICE WRITTEN IN WORDS	UNIT PRICE	TOTAL PRICE
02510.4	380 LF	Bituminous Concrete Curb at_____ _____ Dollars & Cents/Linear Foot		
02633.1	1 EA	Inline Check Valves at_____ _____ Dollars & Cents/Each		
02660.1	1 LS	Remove and Replace 6-inch Water Service at_____ _____ Dollars & Cents/Lump Sum		
02710.1	3,020 LF	Underdrain System at_____ _____ Dollars & Cents/Linear Foot		
02760.1	1 LS	36-inch Effluent Pipe Abandonment at_____ _____ Dollars & Cents/Lump Sum		
02820.1	1,800 LF	Chain Link Fence and Gate – Removal at_____ _____ Dollars & Cents/Linear Foot		
02820.2	1,855 LF	Chain Link Fence Restoration and Improvement at_____ _____ Dollars & Cents/Linear Foot		
02820.3	1 EA	Chain Link Gate – Single at_____ _____ Dollars & Cents/Each		

TABLE 1 – BASE BID				
ITEM NO.	QUANTITY	ITEM OF WORK WITH UNIT PRICE WRITTEN IN WORDS	UNIT PRICE	TOTAL PRICE
02820.4	2 EA	Chain Link Gate – Double at_____ _____ Dollars & Cents/Each		
02820.1	604 LF	Guide Rail - Removal at_____ _____ Dollars & Cents/Linear Foot		
02820.2	2 EA	R-B Terminal Section (Guide Rail) at_____ _____ Dollars & Cents/Each		
02930.1	9,745 SY	Loaming, Seeding, and Revegetation at_____ _____ Dollars & Cents/Square Yard		
03300.1	2,305 CY	Reinforced Concrete Flood Wall at_____ _____ Dollars & Cents/Cubic Yard		
11287.1	1 LS	Deployable Flood Gate Structure and Storage [Gate-A] at_____ _____ Dollars & Cents/Lump Sum		
11287.2	1 LS	Deployable Flood Gate Structure and Storage [Gate-B] at_____ _____ Dollars & Cents/Lump Sum		
11287.3	1 LS	Deployable Flood Gate Structure and Storage [Gate-C] at_____ _____ Dollars & Cents/Lump Sum		
TOTAL BASE BID PRICE IN WORDS:			TOTAL BASE BID PRICE:	

TABLE 2 – ADD ALTERNATE 1 BID				
ITEM NO.	QUANTITY	ITEM OF WORK WITH UNIT PRICE WRITTEN IN WORDS	UNIT PRICE	TOTAL PRICE
03300.2 (ADD ALT. 1)	7,450 SF	Add Alternate 1: Architectural Concrete Finish (A1) at_____ _____ Dollars & Cents/Square Foot		
TOTAL ADD ALTERNATE 1 BID PRICE IN WORDS:			TOTAL ADD ALTERNATE 1 BID PRICE:	

TABLE 3 – ADD ALTERNATE 2 BID				
ITEM NO.	QUANTITY	ITEM OF WORK WITH UNIT PRICE WRITTEN IN WORDS	UNIT PRICE	TOTAL PRICE
03300.3 (ADD ALT. 2)	3,630 SF	Add Alternate 2: Architectural Concrete Finish (A2) at_____ _____ Dollars & Cents/Square Foot		
TOTAL ADD ALTERNATE 2 BID PRICE IN WORDS:			TOTAL ADD ALTERNATE 2 BID PRICE:	

TABLE 4 – ADD ALTERNATE 3 BID				
ITEM NO.	QUANTITY	ITEM OF WORK WITH UNIT PRICE WRITTEN IN WORDS	UNIT PRICE	TOTAL PRICE
03300.4 (ADD ALT. 3)	328 SF	Add Alternate 3: Architectural Concrete Finish (A3) at_____ _____ Dollars & Cents/Square Foot		
TOTAL ADD ALTERNATE 3 BID PRICE IN WORDS:			TOTAL ADD ALTERNATE 3 BID PRICE:	

Owner reserves the right to add or delete items from this list. The price of the contract shall be adjusted accordingly. The price set forth herein includes any and all costs and expenses of whatever source or nature for the work to be performed pursuant to the terms and conditions of the Contract Documents.

If awarded the contract, the undersigned hereby agrees to sign said contract and to furnish the necessary bonds within ten (10) days after being requested to do so by the Owner.

The undersigned has examined the location of the proposed work and is familiar with the Contract Documents and the local conditions at the place where the work is to be done.

The undersigned has checked carefully all of the above figures and understands that the Owner will not be responsible for any errors or omissions on the part of the undersigned in making up this bid.

The undersigned hereby certifies that this bid is genuine, and not sham or collusive, or made in the interest or in behalf of any person not herein named, and that the undersigned has not directly or indirectly induced or solicited any other bidder to put in a sham bid or any other person, firm or corporation to refrain from bidding and that the undersigned has not in any manner sought by collusion to secure for himself or herself an advantage over any other bidder.

Enclosed find bidder's bond or certified check in the amount of five (5%) percent of the bid for _____($_____) to guarantee execution of contract and furnishing of the necessary bonds as above provided, if awarded the contract.

The undersigned has satisfied him/herself by personal examination of the location of proposed work, and by such other measures as they may prefer, as to the actual conditions and requirements of the work, and shall not, after submission of the bid, dispute, complain or assert that there was any misunderstanding in regard to the nature or amount of the work to be done.

Basis of award shall be based on the Total Bid Price to the lowest qualified bidder depending upon available funds.

Contractor acknowledges receipt of Addenda Nos. _____ through _____

This bid is submitted by:

_____
(Complete name of firm to be given here)

Signature: _____ Date: _____

Printed Name as Signed Above: _____

Contact Person: _____

Business: _____

Address: _____

Telephone: _____Employer I. D. # _____

Email Address: _____

Note: If the bidder is a corporation, indicate State of incorporation; if a partnership, give full names and addresses of all partners; and if an individual, give residential address if different from business address. Incorporated in what State: _____

President:	
Treasurer:	
Secretary	

If a Partnership: (Name all Partners)

Name of Partner:	
Residence:	
Name of Partner:	
Residence:	

If an Individual:

Name:	
Residence:	

If an Individual doing business under a firm name:

Name of Firm:	
Name of Individual:	
Business Address:	
Residence:	

The bidder will give below the name and address of the Surety Company who will sign the bonds.

_____

_____

BIDDER'S QUALIFICATION

The Bidder is required to state below work he/she has done of a character similar to that of the work included in the proposed contract and to give references that will enable the Owner to judge his/her experience and skills to successfully undertake this project.

Project/Amount	Description	Contact	Completion Date
1.			
2.			
3.			
4.			
5.			

LIST OF SUB-CONTRACTORS

Any person making a bid to perform the work, shall in his or her bid, set forth: (a) The name and location of the place of business of each subcontractor who will perform work or labor or render service to the prime Contractor in or about the construction of the work or improvement, or a subcontractor licensed by the State of Connecticut who, under subcontract to the primary Contractor specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in the plans and specifications, in an amount in excess of one-half of 1 percent of the prime Contractor's total bid; (b) The portion of the work which will be done by each such subcontractor under this act. The prime Contractor shall list only one subcontractor for each such portion as defined by the prime Contractor in his or her bid.

Any item of work, which does not set forth a designated Subcontractor will be done by the Prime Contractor.

NAME & ADDRESS PORTION OF WORK

_____
_____
_____
_____
_____
_____
_____
_____
_____

(PRIME CONTRACTOR)

Signed by:

Title:

END OF SECTION

NON-COLLUSION AFFIDAVIT

State of _____:

County of _____:s.s.

I state that I am the_____ of _____
(TITLE) (NAME OF MY FIRM)
and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation communication or agreement with any other contractor, bidder/proposer or potential bidder/proposer.

(2) Neither the price(s) nor the amount of this bid/rfp, and neither the approximate price(s) nor approximate amount of this bid/rfp, have been disclosed to any other firm or person who is a bidder/proposer or potential bidder/proposer, and they will not be disclosed before bid/rfp opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding/proposing on this contract, or to submit a bid/proposal higher than this bid/rfp, or to submit any intentionally high or noncompetitive bid/rfp or other form of complementary bid/rfp.

(4) I fully understand that more than one offer from an individual, firm partnership; corporation or association under the same or different name will be rejected. Reasonable grounds for believing that a bidder/proposer is interested in more than one bid/rfp for the work contemplated may cause rejection of all bids/rfps in which the bidder/proposer is interested. Any or all bidders/proposers will be rejected if there is any reason for believing that collusion exists among the bidders/proposers. Participants in such collusion may not be considered in the future offers for the same work. Each bidder/proposer by submitting a bid/proposal certifies that it is not a part to any collusive action.

(5) The bid/rfp of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid/proposal.

(6) _____its affiliates, subsidiaries, officers,
(NAME OF MY FIRM)
directors and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding/proposing on any public contract, except as follows:
I state that _____ understands and acknowledges that
(NAME OF MY FIRM)
the above representations are material and important, and will be relied on by the Town of Stratford in awarding the bid/proposal for which this is submitted. I understand and my firm

understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the Town of Stratford of the true facts relating to the submission of bids/proposals for this contract.

(7) I agree to furnish and deliver all services on the date and time agreed on by _____ and the Town of Stratford once the
(NAME OF MY FIRM)
Contract is signed. Furthermore, there will not be any cancellations to the Town of Stratford. If a bidder/proposer submits a bid/proposal on any services he/she will be responsible for delivering that service at the bid/proposal cost, in accordance with the attached above specifications, which were submitted with this bid/proposal and upon which the bid/proposal was made.

(8) In submitting this bid/proposal, the undersigned declares that this is made without any connection with any persons making another bid/proposal on the same contract; that the bid/proposal is in all respects fair and without collusion, fraud or mental reservation; and that no official of the Town, or any person in the employ of the Town, is directly or indirectly interested in said bid/proposal or in the supplies or work to which it relates, or in any portion of the profits thereof.

(9) The undersigned further understands that the above declarations are material representations to the Town of Stratford made as a condition to the acceptance of the bid/proposal. If found to be false, the Town of Stratford retains the right to reject said bid/proposal and rescind any resultant contract and/or purchase order and notify the undersigned accordingly, thereby declaring as void said bid/proposal and contract or purchase order.

CONTINUTED >>>

VENDOR INFORMATION. (Please print the following)

VENDOR NAME

ADDRESS

TELEPHONE FAX #

E-MAIL WEB SITE

AUTHORIZED SIGNATURE TITLE

(12) By signing this bid/proposal the bidder/proposer understands and agrees to the attached terms, conditions, and specifications, including Collusion among Bidders/Proposers Employment Discrimination by the Contractor Prohibited.

SIGNATURE

SWORN AND SUBSCRIBED TO BEFORE ME, A NOTARY PUBLIC, IN AND FOR THE COUNTY OF AND THE STATE OF

THIS

DAY OF , YEAR

MY COMMISSION EXPIRES

NOTARY PUBLIC

SEARCH

SHARE

What is the Prevailing Wage Bid Package?

Date: August 16, 2023

Read time: 1 minutes

Prevailing Wage Bid Package

- Prevailing Wage Law Poster (PDF)
- Section 31-53b: Construction safety and Health Course. Proof of completion required for employees on public building projects.
  - Informational Bulletin - The 10-Hour OSHA Construction Safety and Health Course (PDF)
- Notice For All Mason Contractors (PDF)
- CT General Statute 31-55a
- Contracting Agency Certification Form (PDF)
- Contractors Wage Certification Form (PDF)

- Payroll Certification - Public Works Projects
- Information Bulletin - Occupational Classifications (PDF)
- Footnotes (Rev. 07/25) (PDF)

Prevailing Wage Information >

Wage and workplace standards

Browse Categories

Unemployment

UI Claims and Eligibility

American Job Centers

CONN-OSHA

CT Jobs

Employment and Training

Mediation and Arbitration

Shared Work

State Board of Labor Relations

Trade Adjustment Assistance

Unemployment Insurance (UI) Tax Division

Unemployment Appeals

Unemployment Overpayments

Workers

Employers

Job Seekers

Related Articles

Additional Benefits Information for Veterans
American Job Center Services for Veterans
Annual Reports to the Connecticut General Assembly Regarding the Application of Military Training or Experience for Service Members
Bridgeport American Job Center
Connecticut Career Resource Network (CCRN)

CT Department of Labor

200 Folly Brook Blvd.
Wethersfield, CT 06109

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Minimum Rates and Classifications for
Heavy/Highway Construction

ID#: 26-0583

Connecticut Department of Labor
Wage and Workplace Standards Division

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number: 2026-15 Project Town: Stratford
State#: FAP#:
Project: Water Pollution Control Facility: Flood Protection

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	50.21	30.01
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	46.09	36.29
2) Carpenters, Piledrivermen	42.03	29.19
2a) Diver Tenders	42.03	29.19
2b) Divers Effluent	67.52	29.19
3) Divers	50.49	29.19
03a) Millwrights	43.25	29.13
03b) Carpenter-Welder	42.53	29.19
03c) Carpenter: Working with creosote lumber or acid	43.03	29.19

As of: January 16, 2026

4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	59.7	26.65
4a) Painters: Brush and Roller	39.57	26.50
4b) Painters: Spray	42.57	26.50
4bc) Painters: Spray Helper	40.57	26.50
4c) Painters: Steel Only	41.57	26.50
4d) Painters: Blast	44.57	26.50
4de) Painter: Blast Helper	40.57	26.50
4e) Painters: Tanks, Tower and Swingstage etc.	41.57	26.50
4f) Elevated Tanks (60 feet and above)	48.57	26.50
5) Electrician (Trade License required: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	47.4	35.32+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	45.25	43.62 + a
7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9)	50.58	36.30
----LABORERS---- -		
8) Group 1: General Laborers and concrete specialist	35.7	28.85

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8) Group 1a: Acetylene Burners (Hours worked with a torch)	36.7	28.85
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	35.95	28.85
10) Group 3: Pipelayers	36.2	28.85
11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators	36.2	28.85
12) Group 5: Toxic waste removal (non-mechanical systems)	37.7	28.85
13) Group 6: Blasters	37.45	28.85
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	38.7	28.85
Group 8: Traffic control signalmen	21.42	28.85
Group 9: Hydraulic Drills	36.45	28.85
Group 10: Toxic Waste Removers A or B With PPE	38.7	28.85
----LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and Liner Plate Tunnels in Free Air.----		
13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders	37.93	28.85 + a
13b) Brakemen, Trackmen, Miners' Helpers and all other men	36.96	28.85 + a

As of: January 16, 2026

----CLEANING, CONCRETE AND CAULKING TUNNEL----		
14) Concrete Workers, Form Movers, and Strippers	36.96	28.85 + a
15) Form Erectors	37.29	28.85 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		
16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers, Miners Helpers	36.96	28.85 + a
17) Laborers Topside, Cage Tenders, Bellman	36.85	28.85 + a
18) Miners	37.93	28.85 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	44.42	28.85 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	44.22	28.85 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	42.24	28.85 + a
21) Mucking Machine Operator, Grout Boss, Track Boss	45.01	28.85 + a
----TRUCK DRIVERS----(*see note below)		
Block Truck	37.48	32.68 + a

2 Axle	36.16	32.68 + a
Helpers	34.66	32.68 + a
Three Axle Trucks; Two Axle Mixer	36.27	32.68 + a
Three Axle Mixer	36.33	32.68 + a
Four Axle Trucks	36.39	32.68 + a
Four Axle Mixer	37.19	32.68 + a
5 Axle	36.39	32.68 + a
5 Axle Mixer	37.19	32.68 + a
Heavy Duty Trailer (40 tons and over)	38.66	32.68 + a
Heavy Duty Trailer (up to 40 tons)	37.39	32.68 + a
Snorkle Truck	36.54	32.68 + a
Swivel Dump and Tack Truck	36.39	32.68 + a
Euclids and Semi Trailer	36.44	32.68 + a

----POWER EQUIPMENT OPERATORS----

Group 1: Crane Handling or Erecting Structural Steel or Stone, Hoisting Engineer (2 drums or over). (Trade License Required)	58.19	29.80 + a
Group 1a: Front End Loader (7 cubic yards or over); Work Boat 26 ft. and over.	53.33	29.80 + a
Group 2: Cranes (100 ton rate capacity and over); Bauer Drill/Caisson. (Trade License Required)	57.78	29.80 + a
Group 2a: Cranes (under 100 ton rated capacity).	56.79	29.80 + a
Group 2b: Excavator over 2 cubic yards; Pile Driver ($3.00 premium when operator controls hammer).	52.92	29.80 + a
Group 3: Excavator; Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar);Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required)	51.92	29.80 + a
Group 4: Trenching Machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper).	51.42	29.80 + a
Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" mandrel)	50.63	29.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	50.63	29.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	50.22	29.80 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under Mandrel)	49.77	29.80 + a

As of: January 16, 2026

Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	49.25	29.80 + a
Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder), Vacuum Excavation Truck and Hydrovac Excavation Truck (27 HG pressure or greater).	48.67	29.80 + a
Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	45.96	29.80 + a
Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	45.96	29.80 + a
Group 12: Wellpoint Operator.	45.87	29.80 + a
Group 13: Compressor Battery Operator.	45.12	29.80 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	43.6	29.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	43.06	29.80 + a
Group 16: Maintenance Engineer.	42.2	29.80 + a
Group 17: Portable Asphalt Plant Operator; Portable Crusher Plant Operator; Portable Concrete Plant Operator., Portable Grout Plant Operator, Portable Water Filtration Plant Operator.	47.91	29.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	44.7	29.80 + a
Surveyor: Chief of Party	48.16	29.80 + a
Surveyor: Assistant Chief of Party	44.41	29.80 + a

As of: January 16, 2026

Surveyor: Instrument Man	42.73	29.80 + a
Surveyor: Rodman or Chairman	36.78	29.80 + a

**NOTE: SEE BELOW

----LINE CONSTRUCTION----(Railroad Construction and Maintenance)----

20) Lineman, Cable Splicer, Technician	59.91	34.00
21) Heavy Equipment Operator	53.92	31.88
22) Equipment Operator, Tractor Trailer Driver, Material Men	50.92	30.84
23) Driver Groundmen	44.93	28.47
23a) Groundman Experienced	32.95	13.99

----OUTSIDE LINE CONSTRUCTION----

24) Driver Groundmen	43.78	28.42
25) Groundmen	32.1	13.95
26) Heavy Equipment Operators	52.53	31.83
27) Linemen, Cable Splicers, Dynamite Men	58.37	33.94

As of: January 16, 2026

28) Material Men, Tractor Trailer Drivers, Equipment Operators	49.61	30.79
29) Technician	56.12	32.85
----COMMUNICATION----		
Sales & Service Technician: To include but not limited to: Installation, Repair, Splicing and Maintenance	48.84	18.07
----DREDGING----		
Class A1: Mechanical Dredge Operator	48.48	17.32+a+b
Class B1: Maintenance Engineer	41.93	16.87+a+b
Class C1: Mate/Welder	38.38	16.62+a+b
Class D: Deckhand	30.86	16.09+a+b

Welders: Rate for craft to which welding is incidental.
Surveyors: Hazardous material removal: $3.00 per hour premium.
*Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.
**Note: Hazardous waste premium $3.00 per hour over classified rate.
Truck Drivers: Trainers Premium: $3.00 over wage rate.
Truck Drivers: Night Premium - Mixer Drivers: $2.00 over wage rate.

Crane with 150 ft. boom (including jib) - $1.50 extra
Crane with 200 ft. boom (including jib) - $2.50 extra
Crane with 250 ft. boom (including jib) - $5.00 extra
Crane with 300 ft. boom (including jib) - $7.00 extra
Crane with 400 ft. boom (including jib) - $10.00 extra

As of: January 16, 2026

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of each apprentice in a specific trade.

~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work ~~

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.
Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.
The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. For those without internet access, please contact the division listed below.
The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.
All subsequent annual adjustments will be posted on our Web Site for contractor access.
Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

As of: January 16, 2026

"General Decision Number: CT20260013 01/02/2026

Superseded General Decision Number: CT20250013

State: Connecticut

Construction Type: Heavy

County: Fairfield County in Connecticut.

HEAVY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/02/2026

BRCT0001-011 01/06/2025

	Rates	Fringes
BRICKLAYER	$ 43.14	34.74

BRCT0001-012 01/06/2025

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 43.14	34.74

CARP0326-019 05/05/2025

	Rates	Fringes
CARPENTER		
CARPENTER, PILEDRIVER	$ 42.03	29.19
DIVER TENDER	$ 42.03	29.19
DIVER	$ 50.49	29.19

CARP1121-006 01/06/2025

	Rates	Fringes
MILLWRIGHT	$ 43.25	29.13

ELEC0003-004 04/17/2025

Darien, Greenwich, New Canaan, Stamford and the portion of Norwalk lying West of Five Mile River

	Rates	Fringes
ELECTRICIAN	$ 45.00	69.17%+5.50

ELEC0488-006 06/01/2025

Bethel, Bridgeport, Brookfield, Danbury, Easton, Fairfield, Monroe, New Fairfield, Newtown, Norwalk, Redding, Ridgefield, Shelton, Sherman, Stratford, Trumball, Weston, Westport and Wilton Townships

	Rates	Fringes
ELECTRICIAN	$ 47.40	3%+35.32

ENGI0478-001 04/06/2025

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 58.19	29.80
GROUP 2	$ 57.78	29.80
GROUP 3	$ 56.79	29.80
GROUP 4	$ 51.92	29.80
GROUP 5	$ 50.63	29.80
GROUP 6	$ 50.22	29.80
GROUP 7	$ 49.25	29.80
GROUP 8	$ 49.25	29.80
GROUP 9	$ 48.67	29.80
GROUP 10	$ 45.96	29.80
GROUP 11	$ 45.96	29.80
GROUP 12	$ 45.87	29.80
GROUP 13	$ 47.91	29.80
GROUP 14	$ 45.12	29.80
GROUP 15	$ 44.70	29.80
GROUP 16	$ 43.60	29.80
GROUP 17	$ 43.06	29.80
GROUP 18	$ 42.20	29.80
GROUP 19	$ 53.33	29.80
GROUP 20	$ 52.92	29.80
GROUP 21	$ 51.92	29.80

Hazardous waste premium $3.00 per hour over classified rate.

Crane with boom, including jib, 150 feet - $1.50 extra.
Crane with boom, including jib, 200 feet - $2.50 extra.
Crane with boom, including jib, 250 feet - $5.00 extra.
Crane with boom, including jib, 300 feet - $7.00 extra.
Crane with boom, including jib, 400 feet - $10.00 extra

1) Crane handling or erecting structural steel or stone, hoisting engineer(2 drums or over)
2) Cranes(100 ton rated capacity and over) Bauer Drill/Caisson
3) Cranes(under 100 ton rated capacity)

a. PAID HOLIDAYS: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday.

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Crane handling or erecting structural steel or stone, hoisting engineer (2 drums or over)

GROUP 2: Cranes (100 ton capacity & over) Bauer Drill/Caisson

GROUP 3: Cranes (under 100 ton rated capacity)

GROUP 4: Trenching machines, lighter derrick, concrete finishing machine, CMI machine or similar, Koehring Loader (skooper).

GROUP 5: Specialty railroad equipment, asphalt spreader, asphalt reclaiming machine, line grider, concrete pumps, drills with self contained power units, boring machine, post hole digger, auger, pounder, well digger, milling machine (over 24' mandrel), side boom, combination hoe and

loader, directional driller

GROUP 6: Front end loader (3 cu. yds. up to 7 cu. yards), bulldozer (Rough grade dozer) .

GROUP 7: Asphalt roller, concrete saws and cutters (ride on types), Vermeer concrete cutter, stump grinder, scraper, snooper, skidder, milling machine (24"" and under Mandrel).

GROUP 8: Mechanic, grease truck operator, hydoblaster, barrier mover, power stone spreader, welder, work boat under 26 ft. transfer machine.

GROUP 9: Front end loader (under 3 cubic yards), skid steer loader (regardless of attachments), bobcat or similar, forklift, power chipper, landscape equipment (including hydroseeder), Vacuum Exacavation Truck and Hydrovac Excavation Truck (27 HG pressure or greater).

GROUP 10: Vibratory hammer,ice machine, diesel & air, hammer, etc.

GROUP 11: Conveyor, earth roller, power pavement breaker (whiphammer), robot demolition equipment.

GROUP 12: Wellpoint operator.

GROUP 13: Portable asphalt plant operator, portable concrete plant operator, portable crusher plant operator, portable grout plant operator, portable water filtration plant operator.

GROUP 14: Compressor battery operator.

GROUP 15: Power Safety boat, Vacuum truck, Zim mixer, Sweeper; (Minimum for any job requiring a CDL license) .

GROUP 16: Elevator operator, tow motor operator (solid tire no rough terrain).

GROUP 17: Generator operator, compressor operator, pump operator,welding machine operator; Heater operator.

GROUP 18: Maintenance engineer.

GROUP 19: Front end loader(7 cubic yards or over); work boat 26 ft. and over.

GROUP 20: Excavator over 2 cubic yards; pile driver($3.00 premium when operator
controls hammer).

GROUP 21: Excavator, gradall, master mechanic, hoisting engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power or operaing), rubber tire excavator (drott 1085
similar), grader operator, bulldozer finegrade (slopes shaping, laser or GPS, ect.)

ENGI0478-007 04/06/2025

	Rates	Fringes

POWER EQUIPMENT OPERATOR:

Asphalt Paver	$ 50.63	29.80
Asphalt Roller	$ 49.77	29.80
Asphalt Spreader	$ 50.63	29.80
Backhoe/Excavator 2 cubic yards and over	$ 52.92	29.80
Backhoe/Excavator under 2 cubic yards	$ 51.92	29.80
Bulldozer (Rough Grade Dozer)	$ 50.22	29.80
Bulldozer Fine Grade(includes slopes, shaping, laser or gps)	$ 51.92	29.80
Crane handling or erecting structural steel or stone	$ 58.19	29.80
Cranes (100 ton capacity & over)	$ 57.78	29.80
Cranes (under 100 ton rated capacity)	$ 56.79	29.80
Drills with self contained power units; Directional driller	$ 50.63	29.80
Earth Roller	$ 45.96	29.80
Forklift	$ 48.67	29.80
Front End Loader (3 cubic yards up to 7 cubic yards)	$ 50.22	29.80
Front End Loader (7 cubic yards or over)	$ 53.33	29.80
Front End Loader (under 3 cubic yards)	$ 48.67	29.80
Grader/Blade	$ 51.92	29.80
Maintenance Engineer/Oiler	$ 42.20	29.80
Mechanic	$ 49.25	29.80
Rubber Tire Backhoe/Excavator	$ 51.92	29.80

a. PAID HOLIDAYS: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday.

b. Crane with boom, including jib, 150 feet - $1.50 extra .
Crane with boom, including jib, 200 feet- $2.50 extra.
Crane with boom, including jib, 250 feet - $5.00 extra.
Crane with boom, including jib, 300 feet - $7.00 extra.
Crane with boom, including jib, 400 feet - $10.00 extra.

1) Crane handling or erecting structural steel or stone, hoisting engineer(2 drums or over)
2) Cranes(100 ton rated capacity and over) Bauer Drill/Caisson
3) Cranes(under 100 ton rated capacity)

IRON0015-005 06/02/2025

	Rates	Fringes
IRONWORKER, REINFORCING	$ 45.25	43.62

a. PAID HOLIDAY: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

LABO0146-002 04/06/2025

	Rates	Fringes
Laborers: (TUNNEL CONSTRUCTION)		
CLEANING, CONCRETE AND CAULKING TUNNEL:		
Concrete Workers, Form Movers and Strippers	$ 36.96	28.85
Form Erectors	$ 37.29	28.85
ROCK SHAFT, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:		
Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	$ 36.96	28.85
Laborers Topside, Cage Tenders, Bellman	$ 36.85	28.85
Miners	$ 37.93	28.85
SHIELD DRIVE AND LINER PLATE TUNNELS IN FREE AIR:		
Brakemen and Trackmen	$ 36.96	28.85
Miners, Motormen, Mucking Machine Operators, Nozzlemen, Grout Men, Shaft and Tunnel, Steel and Rodmen, Shield and Erector, Arm Operator, Cable Tenders	$ 37.93	28.85
TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR:		
Blaster	$ 44.42	28.85
Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	$ 44.22	28.85
Change House Attendants, Powder Watchmen, Top on Iron Bolt	$ 42.24	28.85
Mucking Machine Operator	$ 45.01	28.85

a. PAID HOLIDAYS: On tunnel work only: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.

No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

LABO0146-003 04/06/2025

	Rates	Fringes
LABORERS		
GROUP 1	$ 35.70	28.85
GROUP 2	$ 35.95	28.85
GROUP 3	$ 36.20	28.85
GROUP 4	$ 38.70	28.85
GROUP 5	$ 37.45	28.85
GROUP 6	$ 37.70	28.85
GROUP 7	$ 21.42	28.85

GROUP 8:.....$ 36.70 28.85
GROUP 9:.....$ 38.70 28.85

LABORERS CLASSIFICATIONS

GROUP 1: Laborers (Unskilled), concrete specialist

GROUP 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators and powdermen.

GROUP 3: Pipelayers, Jackhammer/Pavement breaker (handheld), mason tenders/catch basin builders, asphalt rakers, air track operators, block paver and curb setter

GROUP 4: Asbestos/lead removal

GROUP 5: Blasters

GROUP 6: Toxic waste remover

GROUP 7: Traffic control signalman

GROUP 8: Acetylene burner (Hours worked with a torch)

GROUP 9: Toxic Waste Removers A or B With PPE

(On a site designated as a SuperFund Site by the U.S. Army Corps of Engineers and is deemed a HAZ-MAT site, and applies to employees required to wear OSHA leval A or B even if the PPE is not worn.)

PAIN0011-013 06/01/2021

	Rates	Fringes
PAINTER		
Brush and Roller	$ 36.42	22.90
Spray Only	$ 39.42	22.90
Steel Only	$ 38.42	22.90

TEAM0064-001 04/06/2025

	Rates	Fringes
Truck drivers:		
2 Axle Ready Mix	$ 36.27	32.68
2 Axle	$ 36.16	32.68
3 Axle Ready Mix	$ 36.33	32.68
3 Axle	$ 36.27	32.68
4 Axle Ready Mix	$ 37.19	32.68
4 Axle	$ 36.39	32.68
Heavy Duty Trailer 40 tons and over	$ 38.66	32.68
Heavy Duty Trailer up to 40 tons	$ 37.39	32.68
Snorkle Truck	$ 36.54	32.68
Specialized (Earth moving equipment other than conventional type on-the-road trucks and semi-trailers, including Euclids)	$ 36.44	32.68

Hazardous waste removal work receives additional $1.25 per hour.

a. PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

TEAM0064-006 04/06/2025

	Rates	Fringes
TRUCK DRIVER: 4 Axle Truck	$ 36.39	32.68

Hazardous waste removal work receives additional $1.25 per hour.

a. PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas Day and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

SUCT2002-008 12/16/2008

	Rates	Fringes
IRONWORKER, STRUCTURAL	$ 28.62	10.84

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the

contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union

rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION
"

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Clean Water Fund Memorandum (2021-001)

Policy for Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment on Clean Water Fund Projects

I. PURPOSE

To provide municipalities guidance on the federal requirements regarding the inclusion of certain telecommunications and video surveillance services or equipment on Clean Water Fund (CWF) projects.

II. GOVERNING AUTHORITIES

Code of Federal Regulations Section 200.216: Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment

III. POLICY

A. The above referenced prohibition became effective on August 13, 2020.

B. Prohibited telecommunications equipment or services covered by this requirement includes:

- Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
- Video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
- Telecommunications or video surveillance services provided by such entities or using such equipment.
- Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

C. CWF projects affected by this prohibition and options for compliance with this requirement.

- The telecommunication prohibition applies to all future CWF construction projects.

- For projects that are in construction as of the date of this memorandum, the telecommunication prohibition only applies to those CWF projects that have been assigned federal funding. DEEP staff will notify the municipalities that are subject to this requirement and offer the following options for compliance:

  a. redesign and install acceptable equipment;
  b. if equipment is already in place, remove and replace it; or
  c. identify the cost of the installed equipment, leave the equipment in place, and that cost is an ineligible cost for CWF participation.

July 28, 2021
Date

Jennifer L. Perry, P.E.
Director, Water Planning & Management
Bureau of Water Protection & Land Reuse

Clean Water Fund Memorandum (2023-001)

Policy for Change Orders and Submission Requirements

PURPOSE

To provide municipalities with guidance on the requirements regarding the submission of change orders which are being financed by the Clean Water Fund.

GOVERNING AUTHORITIES

Section 22a-482-4(k) to the Regulations of the Connecticut State Agencies (RCSA): Negotiation of Contract Amendments (Change Order)

POLICY

Prior to execution, the municipality is responsible for submitting to DEEP drafts of all change orders greater than $100,000 for review and approval. Related work is not permitted to be split into separate change orders to avoid the approval process for change orders in excess of $100,000. If a change order greater than $100,000 is not submitted for DEEP review and approval prior to execution, then work completed under that change order shall not be eligible to receive funding from the Clean Water Fund program.

The Municipality is responsible for negotiating construction change orders and for submitting copies of change orders to DEEP for review and approval of any project receiving funding through the Clean Water Fund program. The contract price and time may only be changed by a change order. The unit prices shall be determined by the original bid items when possible. A new unit price may be negotiated only when quantity changes (±15% of the original bid quantity) and the total dollar change of that item is significant. Unit prices of new items shall be negotiated. The reimbursement must be based on actual costs and a negotiated amount for overhead and profit.

For each change order in excess of $100,000, the contractor shall submit to the municipality cost and pricing data to enable the municipality to determine the eligibility of costs proposed. It is the responsibility of the municipality to submit such backup information to DEEP.

The RCSA further state that this $100,000 threshold is defined as follows for change orders which include both additive and deductive items:

(A) If any single item (additive or deductive) exceeds $100,000;
(B) If no single additive or deductive item has a value of $100,000 but the total price of the change order is over $100,000; and
(C) If the total of additive items of work in the change order exceeds $100,000 or the total of deductive items of work in the change order exceeds $100,000 and the net price of the change order is less than $100,000.

Examples are included in Attachment A.

The municipality is responsible for submitting all executed copies of change orders to DEEP in a timely manner.

Exception: The following does not require pre-approval: A change order solely for the purpose of the final closeout of a construction project that reconciles the individual bid items based on actual quantities or amounts used versus those projected, provided such change order does not include excessive foreseeable overages (including any changes which warrant a stand-alone change order pursuant to RCSA §§ 22a-482-1—22a-482-4, inclusive) or any additional changes in scope of work.

DEFINITIONS

CGS: Connecticut General Statutes

CWF: Connecticut Clean Water Fund

DEEP: Connecticut Department of Energy and Environmental Protection

RCSA: Regulations of the Connecticut State Agencies

April 18, 2023
Date

Nisha Patel, P.E., Director
Water Planning & Management Division
Bureau of Water Protection & Land Reuse

ATTACHMENT A:
EXAMPLES OF CHANGE ORDERS REQUIRING APPROVAL PRIOR TO EXECUTION

EXAMPLES

1) Any single item greater than a change of $100,000 shall initiate the requirement for pre-approval even when the total of the change order is for less than $100,000.

Bid item	Quantity	Unit Price	Price
Item A	10	$10,100	$101,000
Item B	-5	$1,000	-$5,000
Item C	-1	$100	-$100
Total Price			$95,900

Item A price change is $101,000 and thus initiates the requirement for preapproval.

2) Any change order greater than a total change of $100,000 shall initiate the requirement for pre-approval.

Bid item	Quantity	Unit Price	Price
Item A	6	$10,000	$60,000
Item B	-5	$1,000	-$5,000
Item C	1	$55,000	$55,000
Total Price			$110,000

The total price change is $110,000 and thus initiates the requirement for preapproval.

3) Any change greater than $100,000 of either additive or deducted items shall initiate a requirement for pre-approval even when the total is less than $100,000.

Bid item	Quantity	Unit Price	Price
Item A	5	$10,000	$50,000
Item B	-50	$1,000	-$50,000
Item C	-1	$55,000	-$55,000
Total Price			-$55,000

The total price change for deductible items is -$105,000 and thus initiates the requirement for pre-approval.

NOTE: These examples are presented for illustrative purposes only and are not inclusive of all change order situations. If in doubt or if you have any questions, please contact DEEP's Municipal Wastewater Section.

Connecticut Department of
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79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Clean Water Fund Memorandum (2019-003)

Disadvantaged Business Enterprise (DBE) Subcontractor Participation on Clean Water Fund (CWF) Projects for Construction Projects

I. PURPOSE

The municipality, through its prime contractor must make specified good faith efforts to attain the DBE goals as specified in this document in Section III. This is an administrative condition of the U.S. Environmental Protection Agency (EPA) Grant which funds CWF projects.

This memorandum supersedes the **Clean Water Fund Memorandum (2016-003)**

II. GOVERNING STATUTE OR REGULATION

General Compliance (Federal), 40 CFR, Part 33: The municipality, through its prime contractor must comply with the requirements of EPA's Program for Utilization of DBEs.

III. EPA REQUIREMENTS

The following clause shall be included in all construction contract documents and amendments for goods and services to be funded under the CWF:

The requirement for DBE subcontractor participation, expressed as a percentage of the total eligible contract amount, shall be a minimum of 8.0 percent with the following makeup:

Minority Business Enterprise (MBE): 3.0 percent
Woman Business Enterprise (WBE): 5.0 percent

Failure to meet or exceed the required percentage or submit acceptable documentation of the six good faith efforts may render a bid non-responsive and may cause the bid to be rejected.

IV. THE SIX GOOD FAITH EFFORTS AS SPECIFICALLY DEFINED BY EPA

The Six Good Faith Efforts are required methods employed by all Connecticut Department of Energy and Environmental Protection (DEEP) CWF recipients to ensure that all DBEs have the opportunity to compete for procurements funded by DEEP financial assistance dollars. The prime contractor is expected to employ the six good faith efforts throughout the entire project to insure that the DBE percentages are maintained or exceeded in the event that one DBE subcontractor needs to be substituted for another.

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, State and Local and Government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.

2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.

3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, State and local Government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.

4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.

5. Use the services and assistance of the Small Business Administration (SBA) (Federal) and the Minority Business Development Agency of the Department of Commerce.

6. If the prime contractor awards subcontracts, require the prime contractor to take the above steps.

The prime contractor's certification as a DBE has no effect on this requirement. Therefore, if the prime contractor is a DBE, the Six Good Faith Efforts defined above must be employed in the procurement of subcontracts to be secured to achieve the MBE 3.0% and WBE 5.0% participation.

V. CERTIFICATION

A DBE must be certified at the time that the subcontract for their services is executed. A business that is pending new certification, recertification, or whose certification has expired **cannot** be counted toward the goals.

In the case where a subcontractor DBE is certified as both a MBE and a WBE (a woman who is also a member of a minority class):

1. The prime contractor may count the entire value of the subcontract as either a MBE or a WBE.

2. The prime contractor may choose to split the subcontract between the MBE and the WBE categories to fulfill both goals. If the prime contractor chooses this route:
   a. They must indicate the dollars to be apportioned to the categories either on the face of the copy of the fully executed subcontract submitted to the Connecticut Department of Energy and Environmental Protection (DEEP) or by some other written method.
   b. The certification submitted to DEEP must indicate that the principal of the subcontractor is both a woman and a minority.
   c. For a certification that only identifies the subcontractor as a DBE, additional documentation is required as proof of dual status. In the case of Connecticut Department of Transportation (CTDOT), the detailed information page within their online database suffices as proof.

VI. ACCEPTABLE CERTIFICATION OPTIONS

1. **Connecticut Department of Administrative Services (DAS)** - DEEP will continue to accept DAS certification until such time as other State entities are identified whose certification processes meet the EPA criteria. DAS will only certify Connecticut based firms that meet the criteria under Connecticut General Statute 4a-60g.

2. **CTDOT** - Companies that desire to do business with CTDOT as well as the DEEP should seek CTDOT certification which will be accepted by the DEEP. DBE firms are advised that the certification process can take 90 days to complete. CTDOT will certify both in state as well as out of state firms.

3. **EPA** - In the event an entity cannot be certified by CTDOT as a DBE, that entity should seek certification with EPA. Such entities must provide EPA with evidence from CTDOT denying certification.

4. **SBA** - Certification is available to companies under the Woman Owned Small Business (WOSB) program and the SBA 8(a) Business Development Program (www.sba.gov/8abd/) which has a net worth ceiling of $250,000 for initial applicants.

5. **Other states certification** - Prime contractors may utilize certification from other states. Such certification must specify the DBE designation. Where there is no DBE certification option within a state, the instance must be presented to the DEEP Financial Administrator assigned to the project for consideration on a per case basis.

VII. DBE COMPLIANCE PROCESS

1. Within fourteen (14) calendar days after bid opening the prime contractor (apparent low bidder) shall complete and submit two copies of the DEEP Subcontractor Verification Form along with the DBE certification for each subcontractor to the municipality. The municipality must then submit one copy of these documents to DEEP as part of the authorization to award request.

2. Once DEEP authorizes the municipality to award the contract, the prime contractor is required to submit two copies of the executed DBE subcontracts to the municipality who submits one copy to the DEEP Financial Administrator.

3. No payment requests will be processed by DEEP until the executed copies of the subcontracts and the DBE certifications are on file in the DEEP office.

4. Should the prime contractor not meet the goals, documentation of good faith efforts will be required to be submitted to the DEEP Municipal Facilities Wastewater Engineer for consideration that the good faith effort was extensive enough to warrant the acceptance of a lower goal for the specific contract in question.

5. In the event that a DBE subcontractor is substituted for another during the project, two copies of the executed subcontract along with the corresponding DBE certification for the substitute are submitted to the municipality who forwards one copy of each to the DEEP Financial Administrator.

6. If additional construction costs are approved by DEEP, the prime contractor employs the good faith efforts defined above to meet the goals for the new total eligible contract amount.

VIII. DAS PREQUALIFICATION CERTIFICATION FOR DBE SUBCONTRACTORS

At time that the prime contractor submits copies of the executed DBE subcontracts to the municipality, two copies of the current DAS Prequalification Certificate for each DBE subcontractor whose subcontract value is equal to or greater than $500,000 must also be submitted. In turn, the municipality is required to submit one copy of each DBE Prequalification Certification to the DEEP Financial Administrator. Suppliers of material or products who do not do installation or construction work are not subject to the DAS Construction Contractor prequalification requirement.

IX. SUBMISSION OF THIS FORM

This form is to be signed by the contractor or the contractor's authorized representative. The form is then submitted to the municipality's representative for signature. The municipality includes the form as part of the authorization to award request to DEEP.

I hereby verify that I have read and understand the DBE requirements in this memorandum and will procure subcontracts whose percentages will meet or exceed the minimums listed above.

Contract Name _____

Name of Prime Contractor _____
Name and Title of Authorized Officer _____
Authorized Signature _____ **Date** _____

Town Official and Title _____
Authorized Signature _____ **Date** _____

X. DEFINITIONS

CGS: Connecticut General Statutes

CTDOT: Connecticut Department of Transportation

CWF: Clean Water Fund

DAS: Connecticut Department of Administrative Services

DBE: Disadvantaged Business Enterprise

DEEP: Connecticut Department of Energy and Environmental Protection

EPA: Environmental Protection Agency (Federal)

MBE: Minority Business Enterprise

SBA: Small Business Administration (Federal)

WBE: Woman Business Enterprise

WOSB: Woman Owned Small Business (Federal program - SBA)

June 19, 2019
Date

Denise Ruzicka, Director
Water Planning and Management Division
Bureau of Water Protection & Land Reuse

Connecticut Secretary of the State
Authenticated Electronic Legal Material

Agency
Department of Environmental Protection

Subject
Clean Water Fund

Inclusive Sections
§§ 22a-482-1—22a-482-4

CONTENTS

Sec. 22a-482-1. Introduction and priority management system
Sec. 22a-482-2. Requirements for funding project agreements
Sec. 22a-482-3. Technical program elements
Sec. 22a-482-4. Administrative program elements

Clean Water Fund

Sec. 22a-482-1. Introduction and priority management system

(a) **Definitions** as used in Sections 22a-482-1 to 22a-482-4 inclusive,

(1) "Act" means the Federal Clean Water Act (33 U.S.C. 1251 et seq., as amended).

(2) "Ad valorem tax" means a tax based upon the assessed value of real property.

(3) "Applicant" means a municipality as defined in section 22a-475 of the General Statutes.

(4) "Architectural or engineering services" means consultation, investigations, reporting and design services offered within the scope of the practice of architecture or professional engineering as defined by the laws of the State of Connecticut.

(5) "Building" means the erection, acquisition, alteration, remodeling, improvement or extension of pollution abatement facilities.

(6) "Cash flow projection" means a schedule of expenditures to municipal prime contracts throughout the life of the project.

(7) "Clean Water Fund" means the fund created under sections 22a-475 to 22a-483 inclusive of the General Statutes.

(8) "Collector sewer" means the common lateral sewers, within a publicly owned sewer system, which are primarily installed to receive wastewaters directly from facilities which convey wastewaters from individual systems, or from private property, and which include service "Y" connections designed for connection with those facilities including:

(A) crossover sewers connecting more than one property on one side of a major street, road, or highway to a lateral sewer on the other side when they are more cost-effective than parallel sewers; and

(B) pumping units and pressurized lines serving individual structures or groups of structures when such units are more cost-effective and are owned and maintained by the municipality.

This definition excludes other facilities which convey wastewater from individual structures or from private property to the public lateral sewer or its equivalent and also excludes facilities associated with alternatives to conventional pollution abatement facilities in small communities.

(9) "Combined sewer" means a sewer that is designed as a sanitary sewer and a storm sewer.

(10) "Compatible industrial wastewater" means wastewater that is produced by an industrial user, has a pollutant strength and other characteristics similar to those of domestic wastewater, and can be efficiently and effectively transported and treated with domestic wastewater.

(11) "Complete waste treatment system" means a system that consists of all the pollution abatement facilities necessary to meet the requirements of Title III of the Act, involving the transport of wastewater from individual homes or buildings to a plant or facility where treatment of the wastewater is accomplished; the treatment of the wastewater to remove pollutants; and the ultimate disposal, including recycling or reuse, of the treated wastewater

and residues which result from the treatment process.

(12) "Construction" means the erection, building, acquisition, alteration, remodeling, improvement or extension of pollution abatement facilities; or, the inspection and supervision of any of the foregoing items.

(13) "Cost Analysis" means the review and evaluation of each element of subagreement cost to determine reasonableness, allocability and allowability.

(14) "Design" means studies, surveys, plans, working drawings, specifications, procedures and field testing of innovative and alternative wastewater treatment processes and techniques (excluding operation and maintenance) requisite for the construction of pollution abatement facilities.

(15) "Excessive infiltration/inflow" means the quantity of infiltration/inflow which can be economically eliminated from a sewer system as determined in a cost-effectiveness analysis that compares the costs for correcting the infiltration/inflow conditions to the total costs for transportation and treatment of the infiltration/inflow.

(16) "Grantee" means a municipality as defined in section 22a-475 of the General Statutes.

(17) "Individual systems" means privately owned alternative pollution abatement facilities (including dual waterless/gray water systems) serving one or more principal residences or small commercial establishments. Normally these are onsite systems with localized treatment and disposal of wastewater, but may include systems serving a cluster of principal residences or small commercial establishments.

(18) "Infiltration" means water other than wastewater that enters a sewer system (including sewer service connections and foundation drains) from the ground through such means as defective pipes, pipe joints, connections, or manholes. Infiltration does not include, and is distinguished from, inflow.

(19) "Inflow" means water other than wastewater that enters a sewer system (including sewer service connections) from sources such as, but not limited to: roof leaders, cellar drains, yard drains, area drains, drains from springs and swampy areas, manhole covers, connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash waters, or drainage. Inflow does not include, and is distinguished from, infiltration.

(20) "Initiation of operation" means the date specified by the municipality on which use of the project begins for the purpose that it was planned, designed and built.

(21) "Interceptor sewer" means a sewer which is designed for one or more of the following purposes:

(A) to intercept wastewater from collector sewers and convey such wastes directly to a treatment facility or another interceptor;

(B) to replace an existing pollution abatement facility and transport the waste to an adjoining collector sewer or interceptor sewer for conveyance to a treatment plant;

(C) to transport wastewater from one or more municipal collector sewers to another municipality or to a regional plant for treatment; or

(D) to intercept an existing discharge of raw or inadequately treated wastewater for transport directly to another interceptor or to a pollution abatement facility.

(22) "Municipality" is as defined in section 22a-475 of the General Statutes.

(23) "Nonexcessive infiltration" means the quantity of wastewater flow which cannot be economically and effectively eliminated from a sewer system as determined in a cost-effectiveness analysis.

(24) "Nonexcessive inflow" means the rainfall induced peak inflow rate which does not result in chronic operational problems related to hydraulic overloading of the pollution abatement facility during storm events. These problems may include surcharging, backups, bypasses, and overflows.

(25) "Operation and maintenance" means activities required to assure the dependable and economical functioning of pollution abatement facilities.

(A) Maintenance: preservation of functional integrity and efficiency of equipment and structures. This includes preventive maintenance, corrective maintenance and replacement of equipment as needed during the useful life of the facility.

(B) Operation: control of the unit processes and equipment which make up the pollution abatement facility. This includes financial and personnel management, records, laboratory control, process control, safety and emergency operation planning.

(26) "Pollution abatement facility" is as defined in section 22a-475 of the General Statutes and is synonymous with the terms project, treatment works, treatment system, and treatment facility.

(27) "Pollution abatement facility phase or segment" means any portion of a complete pollution abatement facility described in an approved engineering report which can be identified as a contract or discrete sub-item or subcontract. Completion of the building of a pollution abatement facility phase or segment may, but need not in and of itself, result in an operable pollution abatement facility.

(28) "Planning" means all necessary engineering reports and studies to determine the feasibility of pollution abatement facilities including pertinent engineering, architectural, legal, fiscal and economic investigations prior to design.

(29) "Project performance standards" means the performance and operational requirements applicable to a project including the enforceable requirements of the Act and the specifications which the project is planned and designed to meet.

(30) "Price analysis" means the process of evaluating a prospective price without regard to the contractor's separate cost elements and proposed profit. Price analysis determines the reasonableness of the proposed subagreement price based on adequate price competition, previous experience with similar work, established catalog or market price, law, or regulation.

(31) "Principal residence" means the habitation of a family or household for at least 51 percent of the year. Second homes, vacation or recreation residences are not included in this definition.

(32) "Profit" means the net proceeds obtained by deducting all allowable costs (direct

and indirect) from the price.

(33) "Project schedule" means a timetable specifying the dates of key project events including public notices of proposed procurement actions, subagreement awards, issuance of a notice to proceed with the building and key milestones in the building, initiation of operation and completion of the project.

(34) "Replacement" means expenditures for obtaining and installing equipment, accessories, or appurtenances which are necessary during the useful life of the pollution abatement facility to maintain the capacity and performance for which such works were designed and constructed. The term "operation and maintenance" includes replacement.

(35) "Sanitary sewer" means a conduit intended to carry liquid and water carried wastes from residences, commercial buildings, industrial plants and institutions together with minor quantities of ground, storm and surface waters that are not admitted intentionally.

(36) "Services" means a contractor's labor, time or efforts which do not involve the delivery of a specific end item, other than documents which may result from the contractor's labor, time or efforts (e.g., reports, design drawings, specifications). This term does not include employment agreements or collective bargaining agreements.

(37) "Small commercial establishments" means private commercial establishments such as restaurants, hotels, stores, filling stations, or recreational facilities; or private, non-profit entities such as: churches, schools, hospitals, or charitable organizations having dry weather wastewater flows of less than 25,000 gallons per day.

(38) "Small community" means any municipality with a population of 5,000 or less or highly dispersed sections of large municipalities, as determined by the Commissioner.

(39) "Storm sewer" means a sewer designed to carry only storm waters, surface runoff, street wash waters and drainage.

(40) "Subagreement" means a written agreement between a grant recipient and another party (other than another public agency) and any lower tier agreement for services, supplies, equipment, or construction necessary to complete the project. Subagreements include contracts and subcontracts for personal and professional services, agreements with consultants and purchase orders.

(41) "Useful life" means the period during which a pollution abatement facility will be operated.

(42) "User charge" means a charge levied on users of a pollution abatement facility, or that portion of the ad valorem taxes paid by a user, for the user's proportionate share of the cost of operation and maintenance (including replacement) of such facility.

(43) "Value engineering" (VE) means a specialized cost control technique which uses a systematic and creative approach to identify and to focus on unnecessarily high costs in a project in order to arrive at cost savings without sacrificing the reliability or efficiency of the project.

(b) **Development and Format of Project Priority List.**

(1) The Commissioner shall make funding assistance available for projects on a state priority list as established under this section for such periods as are authorized by the

Legislature under Chapter 446k of the General Statutes.

(2) The Commissioner shall prepare an ordered priority listing of projects for which state funding assistance shall be made available for the period effective July 1st to the following June 30th corresponding to the state fiscal year.

(3) The priority list shall contain two portions: (A) a fundable portion consisting of those highest priority projects ready for construction and anticipated to be funded within the current state fiscal year; and (B) a future portion consisting of those projects that may be funded from future authorized allotments.

(c) **State Priority System and Project Priority List.**

(1) Priority Rating Criteria. All projects eligible for funding assistance shall be evaluated and assigned a priority rating in accordance with the criteria set forth below and will appear on the project priority list. The Commissioner may determine that large-scale, multi-phase projects be segregated and rated separately. Each project shall be evaluated and given points as applicable for each of the following rating criteria, the sum of which shall determine its priority number. These criteria are consistent with the rating system used to establish federal funding priorities and are shown in the following table:

PRIORITY RATING POINT SYSTEM

I. Benefit of project upon adversely impacted potable water supplies. (10 points maximum)

A. Impaired water supply affecting less than 25 people–2 points.

B. Impaired water supply affecting 26 to 100 people–4 points.

C. Impaired water supply affecting 101 to 1,000 people–6 points.

D. Impaired water supply affecting 1001 to 5,000 people–8 points.

E. Impaired water supply affecting more than 5,000 people–10 points.

II. Benefit of project toward attainment of designated water quality standards and goals. (28 points maximum)

A. Project is necessary for attainment of water quality standards where the impacted water resource is:

1. Smaller than main stem of a sub-regional drainage basin or groundwater goals will be attained–5 points.

2. Main stem of sub-regional drainage basin–10 points.

3. Main stem of regional drainage basin–15 points.

4. Main stem of major drainage basin–20 points.

B. Project will impact coastal areas (considered the equivalent of a regional drainage basin)–15 points.

For the purposes of the Priority Rating Point System, the drainage basin designations are defined on the map entitled "Natural Drainage Basins in Connecticut: 1981" prepared by the Natural Resources Center of the Department of Environmental Protection in cooperation with the United States Geological Survey.

C. Project will enable impacted waters to meet minimum dissolved oxygen standards–8 points.

III. Project will enhance specific water resource values. (24 points maximum)

A. Fishery resources–(6 points maximum).

1. Project will improve recreational fisheries–3 points.

2. Project will improve anadromous fisheries–6 points.

3. Project will open new streams for fish stocking programs–6 points.

B. Shellfish resources–(6 points maximum).

1. Project will lower coliform bacteria levels in the waters of shellfish beds–3 points.

2. Project will open new areas for shellfishing–6 points.

C. Swimming–(6 points maximum).

1. Project will enhance existing swimming opportunities–3 points.

2. Project will allow for new swimming opportunities–6 points.

D. Eutrophication–(6 points maximum).

1. Project will reduce eutrophication of a lake or impoundment by diverting septic system discharges out of a drainage basin–3 points.

2. Project will reduce eutrophication of a lake or impoundment by providing nutrient removal in a municipal treatment plant or by relocating an existing treatment plant discharge–6 points.

IV. Population equivalent (including commercial and industrial waste) initially served by the project. (12 points maximum)

A. Less than 5000–2 points.

B. 5,000 but less than 10,000–4 points.

C. 10,000 but less than 20,000–6 points.

D. 20,000 but less than 40,000–8 points.

E. 40,000 but less than 75,000–10 points.

F. 75,000 or greater–12 points.

V. Health and Sanitation Impacts. (6 points)

Project will eliminate ponding of sewage from failing septic systems, backup of sewage into basements, or overflow of sewage in streets (combined sewer overflow correction projects are not eligible for points).

VI. Miscellaneous. (20 points maximum)

A. Project involves the upgrading of an existing primary facility in order to comply with secondary treatment standards–5 points.

B. Project that will result in Commissioner rescinding an Order concerning a sewer connection moratorium–5 points.

C. Project will eliminate nuisance odors associated with treatment processes or pump stations but exclusive of large-scale expansion or upgrading of pollution abatement facilities–5 points.

D. Remedial action will improve treatment plant operations where treatment standards are already being achieved–5 points.

VII. Connecticut Housing Partnership Program–Development Designation Community has received development designation–3 points.

Note: In cases where the priority rating or score is the same for two or more projects, the order is determined by the highest score assigned cumulatively in criteria II (total), III (total), and IV. If a tie still remains, preference will be given to those projects ready to proceed at the earliest date within the limit of funds available.

(2) Project Ranking Mechanism. The relative position or rank of a project on the priority list for funding will be determined by its priority number and its readiness to proceed to construction during the funding year under consideration. The Commissioner may choose to assign a higher rank for projects which fall into one of the following categories:

(A) Category I–Consists of projects for which a construction application was submitted for review during the previous funding period and which were on the fundable portion of that year's priority list. These applications have undergone preliminary review, are essentially complete and represent the good faith efforts of municipalities to comply with grant program requirements. Only those projects from the fundable portion of the previous year's priority list can be placed in this category;

(B) Category II–Consists of phased projects where previous phases were funded by the Clean Water Fund: Phased funding takes into account local disruption created by construction activities and the ability of the Clean Water Fund to finance the entire project in one fiscal year. The state has a strong commitment to a phased project once it is initiated.

(C) Category III–Consists of projects which remedy documented pollution of potable water supplies. In order to qualify for high ranking for funding within this special category, projects must meet the following basic criteria: (i) the scope of the pollution problem is significant; (ii) the affected water supply is not potable, i.e. does not meet minimum drinking water standards and requires treatment beyond chlorination; and (iii) pollution abatement facilities are the cost-effective solution to the problem. This category does not apply to potential emergency use of class B waters for potable water supply as defined in the Connecticut Water Quality Standards adopted pursuant to section 22a-426 of the General Statutes.

(3) Order of Funding Priority. The Commissioner shall distribute funds subject to the requirements for public hearing set forth in this section. It is the goal to establish a balance between planning, design and construction. Therefore, all needs within the highest funding designation need not be fulfilled before proceeding to the next highest funding designation. The following categories establish the general order in which assistance is made:

(A) funds to finance temporary loans for planning and design pursuant to section 22a-478 (e) of the General Statutes necessary for planning and design for sewage facility projects;

(B) a reserve of funds to finance unanticipated cost increases for projects previously funded;

(C) a reserve of funds sufficient to finance at least one small community project;

(D) additional set asides which the Commissioner may establish if he or she determines that serious health or water quality problems caused by wastewater facilities are in the public interest to correct, but will not receive sufficient-priority to correct in a time frame he or

she considers reasonable; and

(E) funds available for construction.

(4) Annual Public Hearing. The amount of funds applied to each category described in subdivision (3) of this subsection shall be determined annually by the Commissioner based upon available funds and shall be designated in a draft priority list. The draft priority list will indicate which specific projects are proposed to receive funding within each funding designation for the upcoming fiscal year and shall be made available to appropriate local officials at least thirty (30) days prior to a specified date for public hearing. The Commissioner will consider all written and oral testimony presented at the hearing and may elect to modify the draft priority list on the basis of such testimony. The Commissioner shall also indicate his or her reasons for accepting or rejecting any suggested revisions as part of the hearing record. Following notice of any changes to the priority list which may result from the hearing, the priority list shall be deemed final except for minor revisions allowable under subdivision (5) of this section.

(5) Revisions to the Priority List.

(A) The priority system shall include a project bypass procedure. The Commissioner may bypass a project on the fundable portion of the priority list if he or she determines that the bypassed project will not be ready to proceed within the first six months of the funding year. The Commissioner shall advise, in writing, each municipality he or she intends to bypass and the reasons therefore. Projects that are bypassed will retain their relative priority rating for consideration in future years. Projects bypassed will be replaced by the next highest ranking project ready to proceed. Projects will be removed from the priority list the following year after they receive funding.

(B) Revisions to the priority list may be made at any time during the funding period. If the Commissioner determines the change to be significant, a public hearing with appropriate notice will be held and all affected by such a change will be notified directly.

(Effective March 5, 1992)

Sec. 22a-482-2. Requirements for funding project agreements

(a) **Types of Projects.** The Commissioner is authorized to award assistance for the following types of projects:

(1) Planning: the preparation of engineering reports;

(2) Design: the preparation of contract plans and specifications; and

(3) Construction: the building of pollution abatement facilities and sewers.

(b) **Level of State Assistance.** The amount of state funding assistance shall be based on the Commissioner's determination of eligibility and the provisions of sections 22a-475 to 22a-483, inclusive, of the General Statutes.

(c) **Applications for Funding Assistance.** A municipality applying for funding assistance shall file properly executed forms and applications prescribed by the Commissioner. In addition, the following supporting documentation shall be submitted as appropriate:

(1) An Application for Engineering Report Funding Assistance which shall include:

(A) a Plan of Study including:

(i) the proposed planning area;

(ii) an identification of the entity or entities that will be conducting the planning;

(iii) the nature and scope of the proposed planning project and public participation program, including a schedule for the completion of specific tasks; and

(iv) an itemized description of the estimated engineering report costs;

(B) proposed subagreements, or an explanation of the intended method of awarding subagreements, for performance of any substantial portion of the project;

(C) a resolution adopted by the municipality's Water Pollution Control Authority authorizing a specific person to file the application and execute the agreement. The resolution shall be certified and sealed by the Town/City Clerk; and

(D) a cash flow projection.

(2) An Application for Design Funding Assistance which shall include:

(A) an engineering report meeting all the requirements set forth in section 22a-482-3 (a) of the Regulations of Connecticut State Agencies.

(B) proposed subagreements, or an explanation of the intended method of awarding subagreements, for performance of any substantial portion of the project;

(C) a resolution adopted by the municipality's Water Pollution Control Authority authorizing a specific person to file the application and execute the agreement. The resolution must be certified and sealed by the Town or City Clerk;

(D) a value engineering (VE) commitment in compliance with section 22a-482-3 (d) of the Regulations of Connecticut State Agencies for all design funding assistance applications for projects with a projected total building cost of $10 million or more, including the cost for interceptor and collector sewers. For those projects requiring VE, the municipality may propose, subject to the Commissioner's approval, to exclude interceptor and collector sewers from the scope of the VE analysis;

(E) proposed or executed (as determined appropriate by the Commissioner) inter-municipal agreements necessary for the construction and operation of the proposed pollution abatement facility for any facility serving two or more municipalities;

(F) a schedule for initiation and completion of the project work;

(G) evidence that local authority to construct the facilities has been obtained; and

(H) a cash flow projection.

(3) An Application for Construction Assistance which shall include:

(A) all requirements for design funding assistance as specified in subdivision (c) (2) of this section;

(B) a final legal opinion stating that the acquisition of all sites, easements or rights-of-way necessary to assure undisturbed construction and operation and maintenance of the proposed project have been acquired. The cost of any real property eligible for funding assistance must reflect fair market value as determined by standard recognized appraisal methods;

(C) two copies of contract plans and specifications for the review and approval of the Commissioner;

(D) a schedule for submission of a proper operation and maintenance program including a preliminary plan of operation;

(E) an approved user charge system developed in accordance with the requirements set forth in section 22a-482-3 (e) of the Regulations of Connecticut State Agencies;

(F) a cash flow projection; and

(G) amounts and terms of any other financial assistance.

(d) **Terms of Funding Assistance.**

(1) No financial assistance shall be made for a pollution abatement facility that would provide capacity for new connections or other developments to be located in environmentally sensitive land such as wetlands, floodplains, prime agricultural lands, or regulated coastal zones. Appropriate and effective funding conditions (e.g. restricting sewer hook-ups) should be used where necessary to protect these resources from new development.

(2) The prime purpose in the award of construction assistance is to solve existing pollution problems and not intended to assist in new development.

(3) For engineering reports and design, no financial assistance will be allowed for any engineering work performed before award without the prior written approval of the Commissioner.

(4) Except as otherwise provided in this subsection, no assistance for construction may be awarded for any construction which is initiated prior to the date of award. Preliminary construction work, such as advance acquisition of major equipment items requiring long lead times, acquisition of an option for the purchase of eligible land, or advance construction of minor portions of a pollution abatement facility, including associated engineering costs, in emergencies or instances where delay could result in significant cost increases, may be approved by the Commissioner after the completion of an environmental review, but only if the municipality submits a written and adequately substantiated request.

(5) The approval of a plan of study, an engineering report, plans and specifications, advance acquisition of equipment or advance construction will not constitute a commitment or approval of assistance for a subsequent phase of the project. In instances where such approval is obtained, the applicant proceeds at its own risk, since payment for such costs cannot be made unless assistance for the project is awarded.

(6) The municipality shall notify the Commissioner that it has complied or will comply with the applicable procurement provisions of subsections (f), (g) and (h) of 22a-482-4 of the Regulations of Connecticut State Agencies before the award of any assistance.

(7) Within ninety (90) days after receipt of a completed application (excluding suspension periods for submission of supplemental information), the Commissioner will take one of the following actions: (A) approve for award; (B) defer due to lack of funding; or (C) disapprove the application. The applicant shall be promptly notified, in writing, of any deferral or disapproval. A deferral or disapproval of an application shall not preclude

its reconsideration or a reapplication.

(8) The Commissioner will transmit the funding agreement to the applicant for execution. The agreement must be executed by the applicant and returned within three (3) calender weeks after receipt. The agreement shall set forth the approved project scope, budget (cash flow analysis), total project costs, and the approved commencement and completion dates for the project or major phases thereof.

(9) The project funding agreement shall set forth the amount of funding assistance. The amount may not exceed the amount of funds available.

(10) The amount and term of funding assistance shall be determined at the time of award. The time period is subject to extension for excusable delay, at the discretion of the Commissioner.

(11) The amount of financial assistance shall not exceed 100% of the cost eligible for grant and loan. Calculation of a grant or loan available shall first include a deduction of financial assistance available from other sources.

(12) The municipality may finance short term debt through the marketplace or from the Clean Water Fund.

(A) Accrued interest on funds borrowed from the marketplace shall be paid at the time of borrowing.

(B) Accrued interest on amounts borrowed from the Clean Water Fund may be either paid at the time of such borrowing or become part of the principal to be repaid over the term of the project and shall be determined by the Commissioner at the time of issuance of the project funding obligation. Short term interest shall be charged at the rate of 2% per year compounded annually for all outstanding loan balances. Interest on short term obligations shall be computed on the basis of a year of 360 days and the number of days elapsed. Interest shall be charged from the date a check is issued from the fund to the municipality.

(13) Grant proceeds shall be disbursed only upon a determination by the Commissioner that satisfactory documentation of eligible grant costs have been received.

(14) The Commissioner shall establish a procedure for disbursement of grant and loan proceeds to the municipalities.

(15) The municipality shall use the proceeds of the project loan and the project grant solely for the purpose of funding the project. The municipality shall promptly disburse to all contractors the proceeds of such project loan and project grant on the same day that it receives proceeds from the state.

(16) The municipality shall agree and covenant in the project funding agreement that it shall, at all times, do and perform all acts and things reasonably requested by the state to insure interest paid on any tax exempt obligations issued by the state to fund the Clean Water Fund shall, for the purposes of federal income taxation, be excludable from the gross income of the recipients thereof under the Internal Revenue Code of 1986, as amended.

(17) The municipality shall have all project costs, loans, and grants audited by an auditor approved by the Commissioner.

(18) The municipality shall repay to the Clean Water Fund all outstanding loan balances, including principal and interest accrued, within twenty years from the scheduled completion date of the project.

(19) The municipality shall establish a dedicated source of repayment of the loan satisfactory to the Commissioner.

(20) Each project loan obligation shall be paid in substantially equal monthly installments of principal and interest or in monthly installments of principal plus interest which shall be sustantially equal and which shall be arranged such that no principal installment payable in any month shall be less than the amount of any installment payable in any subsequent month.

(21) Payments on long term loans shall begin one year from the scheduled completion date of the project. Should excusable delay cause the actual completion to go beyond scheduled completion the Commissioner and the municipality shall enter into a project funding agreement to cover project cost incurred after the specified date.

(22) The Commissioner shall make loans to the municipalities at an interest rate not to exceed two percent compounded annually.

(23) Interest on the loan shall be computed on the basis of 360 days and the actual number of days elapsed.

(24) The Commissioner may provide short term loans to municipalities for planning and design, as applicable, of an eligible water quality project. The municipalities may not be required to begin repaying its short term loan for planning or design, as applicable, until six months after the date of completion of such planning or design provided the municipality must commence design or construction, as applicable, within six months.

(25) The municipality shall comply with the following federal laws and Executive Orders:

(A) Archeological and Historic Preservation Act of 1974, P.L. 93-291;

(B) Coastal Barrier Resources Act, 16 U.S.C. 3501 et seq.;

(C) Coastal Zone Management Act of 1972, P.L. 92-583;

(D) Endangered Species Act, 16 U.S.C. 1531, et seq.;

(E) Executive Order 11593, Protection and Enhancement of the Cultural Environment;

(F) Executive Order 11990, Protection of Wetlands;

(G) Farmland Protection Policy Act, 7 U.S.C. 4201 et. seq.;

(H) Fish and Wildlife Coordination Act, P.L. 85-624;

(I) National Historic Preservation Act of 1966, P.L. 89-665;

(J) Safe Drinking Water Act, section 1424 (e), P.L. 92-523;

(K) Wild and Scenic Rivers Act, P.L. 90-542;

(L) Demonstration Cities and Metropolitan Development Act of 1966, P.L. 89-754;

(M) Section 306 of the Clean Air Act and Section 508 of the Clean Water Act, including Executive Order 11738;

(N) Brooks Murkowski Act, P.L. 100-202;

(O) Age Discrimination Act, P.L. 94-135;

(P) Civil Rights Act of 1964, P.L. 88-352;
(Q) Section 13 of P.L. 92-500, prohibition against sex discrimination;
(R) Executive Order 11246, Equal Employment Opportunity;
(S) Executive Orders 11625 and 12138, Women's and Minority Business Enterprise;
(T) Rehabilitation Act of 1973, P.L. 93-112, including Executive Orders 11914 and 11250;
(U) Uniform Relocation and Real Property Acquisition Policies Act of 1970, P.L. 91-646;
(V) Executive Order 12549, Debarment and Suspension;
(W) Executive Order 11988, Flood Plain Management; and
(X) Clearn Air Act, 42 U.S.C. 7506 (c).

(Effective March 5, 1992)

Sec. 22a-482-3. Technical program elements

(a) **Engineering Report Requirements.**

(1) General. Engineering reports consist of those necessary plans and studies which directly relate to the development of pollution abatement strategies and the construction of pollution abatement facilities necessary to comply with an Order to Abate Pollution as defined in section 22a-423 of the General Statutes. The engineering report will demonstrate the need for the proposed pollution abatement facility through an evaluation of all feasible alternatives and shall demonstrate that the selected alternative is cost-effective, i.e. is the most economical means of meeting effluent and water quality goals while recognizing environmental considerations.

(2) Content of Engineering Reports. The content of the engineering report shall be determined by the Commissioner based on a pre-report conference with the municipality and its engineering consultant regarding the precise plan of study (engineering report outline) and resulting scope of services to be performed. Engineering reports shall address at a minimum each of the following as determined appropriate by the Commissioner:

(A) A detailed evaluation of the existing and potential wastewater treatment and disposal problems in the study area;

(B) a cost-effective analysis of alternatives available to correct the pollution problems identified. The final selection of alternative(s) to correct the problems noted shall be based on the results of the cost-effective analysis, including the present worth or equivalent annual value of all capital costs, and operation, maintenance and replacement costs. The interest rate used for this analysis shall be the rate established by the Federal Water Resources Council for use in federally funded projects. The population forecasting in the analysis shall be consistent with current projections of the Connecticut Office of Policy and Management. A cost-effective analysis shall include:

(i) the relationship of the size and capacity of the recommended facilities to the needs to be served, including any reserve capacity;

(ii) an evaluation of alternative flow and waste reduction measures, including

nonstructural methods;

(iii) an evaluation of improved effluent quality attainable by upgrading the operation, maintenance and efficiency of existing facilities as an alternative or supplement to construction of new pollution abatement facilities;

(iv) an evaluation of the capability of each alternative to meet applicable effluent limitations and water quality standards;

(v) various treatment techniques including: conventional biological or physical-chemical treatment and discharge systems; land application techniques and other innovative and alternative techniques which may result in recycling of water and pollutants; onsite and nonconventional systems, both community and individual;

(vi) an evaluation of the alternative methods for the ultimate disposal of treated wastewater and sludge materials resulting from the treatment process and a justification for the method(s) chosen; and

(vii) an adequate assessment of the expected environmental impact of alternatives (including sites) under the requirements of sections 22a-1a to 22a-1h, inclusive, of the General Statutes;

(C) if applicable, a demonstration of the non-existence or possible existence of excessive infiltration/inflow in the affected sewerage system;

(D) an identification of proposed effluent discharge limits, if appropriate, and a description of how the proposed project will result in compliance with any pollution abatement order issued by the Commissioner;

(E) a summary of public participation in the development of the engineering report;

(F) a brief statement demonstrating that the local authorities who will be implementing the plan have the necessary legal, financial, institutional, and managerial resources available to insure the construction, operation and maintenance of the proposed pollution abatement facilities;

(G) a brief description of potential opportunities for recreation, open space, and access to bodies of water afforded by the recommended project; and

(H) for the selected alternative, a concise description of at least the following;

(i) estimated capital construction, and operation and maintenance costs;

(ii) estimated cost of future expansion and long term needs for reconstruction of pollution abatement facilities following their useful life;

(iii) cost impacts on pollution abatement facility users; and

(iv) a statement concerning the availability and estimated cost of any proposed treatment sites.

(3) Public Participation.

(A) The scope and level of detail of the public participation program shall be determined during the development of the plan of study. The program shall be comprised of public forums such as workshops, meetings and hearing(s) as necessary to promote public awareness and input into the planning process.

(B) At a minimum, prior to adoption of the engineering report, the municipality must

hold a public hearing to describe the proposed program and action(s) and to assure that the public's concerns are fully considered.

(C) The time and place of the public hearing shall be conspicuously and adequately announced at least 10 days in advance, or for such longer period as may be required by local ordinance or charter. Copies of the engineering report must be made available for inspection by the public at least 10 days prior to the hearing.

(D) A request to waive the public hearing on an engineering report may be submitted in writing to the Commissioner when the municipality determines a public hearing is not necessary and would not serve the public interest.

(4) Environmental Review. Prior to the award of a project funding agreement for design or construction, the requirements of the Connecticut Environmental Policy Act (sections 22a-1 to 22a-1h, inclusive, of the General Statutes) shall have been met. The municipality must prepare an adequate environmental assessment of expected environmental impacts consistent with the requirements of sections 22a-1a to 22a-1h, inclusive, of the General Statutes as part of facility planning. Projects receiving financial assistance shall comply with the following:

(A) for any project not required in the department's Environmental Classification Document to undergo an environmental impact evaluation or finding of no significant impact, the Commissioner shall publish a notice in a newspaper of community-wide circulation indicating the determination that a Finding of No Significant Impact is not necessary and that supporting documentation for this determination is available for inspection.

(B) when the Commissioner determines that significant changes in the project or environmental conditions have occurred, an amendment to the Environmental Impact Evaluation or the Finding of No Significant Impact or the determination that a Finding of No Significant Impact is not necessary will be issued in accordance with sections 22a-1a to 22a-1h, inclusive, of the General Statutes.

(C) for Environmental Impact Evaluations, Findings of No Significant Impact, or determinations that a Finding of No Significant Impact is not necessary which are five or more years old for projects seeking a construction project funding agreement, the Commissioner shall re-evaluate the project, environmental conditions and public comments and prior to financial award shall either:

(i) issue a public notice in a newspaper of community-wide circulation reaffirming the decision to proceed with the project without revising the Finding of No Significant Impact or Environmental Impact Evaluation or reaffirming that a Finding of No Significant Impact is not necessary; or

(ii) update information and prepare or amend the Environmenta1 Impact Evaluation or Finding of No Significant Impact in accordance with sections 22a-1a to 22a-1h, inclusive, of the General Statutes;

(iii) withdraw the Finding of No Significant Impact and prepare an Environmental Impact Evaluation in accordance with the sections 22a-1a to 22a-1h, inclusive, of the

General Statutes.

(D) in the development of the Finding of No Significant Impact, the Commissioner shall include a description and analysis of the reasonable alternatives to the proposed action, including no action.

(b) **Small Community Systems.** Projects proposed to be funded from the Reserve for Small Communities shall be for improvements to existing wastewater treatment systems or new collector sewers, interceptor sewers and treatment works serving small communities. Routine interceptor sewer extensions within municipalities that do not meet the definition of a small community are not eligible for funding from this reserve. Categories of projects eligible for assistance under this reserve are: (1) projects involving improvements to or construction of collector sewers, interceptor sewers and treatment works for which the entire proposed service area within the municipality meets the definitions of a small community; and (2) projects for interceptor sewers connecting a service area meeting the definition of a small community to a wastewater treatment facility in another municipality. In order to be eligible for funding under this reserve, the applicant must demonstrate to the satisfaction of the Commissioner that the only alternative to the proposed project would be the construction of new treatment works which would involve a discharge of treated wastewater which would result in violation of, or require a revision to, the State's Water Quality Standards and Criteria as adopted pursuant to section 22a-426 of the General Statutes.

(c) **Privately Owned Individual Systems.**

(1) A municipality may apply for funding assistance to construct privately owned pollution abatement facilities serving one or more principal residences or small commercial establishments.

(2) In addition to the engineering report requirements set forth in subsection (a) of this section the municipality shall:

(A) demonstrate that the total present worth cost and environmental impact of building the individual systems will be less than the present worth cost of a larger municipally owned pollution abatement facility;

(B) demonstrate to the satisfaction of the Commissioner that the individual systems proposed are part of a technically feasible and implementable program which will successfully address all existing and potential wastewater treatment needs within the planning area;

(C) certify that each principal residence or small commercial establishment was constructed before July 1, 1983, and inhabited or in use on or before that date;

(D) apply on behalf of a number of individual units to be served in the planning area;

(E) certify that, where public ownership of such works is not feasible, the municipality will have unlimited right of access to the site and to the system for the purpose of necessary inspection, maintenance, and repair;

(F) certify that such treatment works will be properly operated and maintained and will comply with all other requirements of sections 22a-482-1 to 22a-482-4 of the Regulations of Connecticut State Agencies, applicable state statutes and regulations; and

(G) certify that a user charge system, established in compliance with section (e) of this subsection, will be developed and implemented to ensure the availability of financial resources sufficient to ensure the proper operation, maintenance, and eventual repair or replacement of funded facilities and those individual systems which are within the service area identified in subparagraph (B) of this subsection but which are not required and replaced with the assistance funds.

(d) **Value Engineering (VE)**

(1) Value Engineering Proposal. All design funding assistance applications for projects having a projected total building cost of $10 million or more, including the cost for interceptor and collector sewers, will contain a VE proposal. The VE proposal must contain sufficient information for the Commissioner to determine the adequacy of the VE effort and the justification of the proposed VE fee. Essential information shall include the scope of VE analysis, VE team and VE coordinator (names and background), level of VE effort, VE cost estimate, and VE schedule in relation to the project schedule (including completion of VE analysis and submittal of VE summary reports). The VE coordinator and a majority of the VE team members shall be employed by a firm (or firms) other than the design engineering consultant.

(2) Value Engineering Analysis. When the VE analysis is completed, a preliminary report summarizing the VE findings and a final report describing implementation of the VE recommendations must be submitted to the Commissioner.

(3) Valve Engineering Implementation. For those projects on which a VE analysis has been performed, VE recommendations shall be implemented to the maximum extent feasible, as determined by the municipality, subject to the approval of the Commissioner. Rejection of any recommendations shall be on the basis of cost-effectiveness, reliability, and other factors that may be critical to the treatment processes, the environmental impact of the project and the extent of project delays.

(e) User Charge System. The user charge system must be designed to produce adequate revenues required for the operation, maintenance, and replacement of the pollution abatement facilities. It shall provide that each user which discharges wastewaters to the system, causing an increase in the cost of operating and maintaining the pollution abatement facilities, shall pay for such increased cost. The user charge system shall be based on either actual use or ad valorem taxes as follows:

(1) User Charge System Based on Actual Use. A municipality's user charge system based on actual use (or estimated use) of wastewater treatment services shall provide that each user (or user class) pays its proportionate share of operation and maintenance (including replacement) costs of the pollution abatement facilities within the municipality's service area, based on the user's proportionate contribution to the total wastewater loading from all users (or user classes).

(2) User Charge System Based on Ad Valorem Taxes. A municipality's user charge system which is based on ad valorem taxes shall provide that:

(A) on the effective date of sections 22a-482-1 to 22a-482-4, inclusive, of the

Regulations of Connecticut State Agencies, the municipality had in existence a system of dedicated ad valorem taxes which collected revenues to pay the cost of operation and maintenance of the pollution abatement facilities within the municipality's service area and the municipality has continued to use that system;

(B) each member of the industrial user and commercial user class which discharges more than 25,000 gallons per day of sanitary waste pays its share of the costs of operation and maintenance (including replacement) of the pollution abatement facilities based upon charges for actual use; and

(C) the Commissioner determines that the municipality has historically demonstrated that the ad valorem system has resulted in proper operation, maintenance and management of the pollution abatement facilities, including the sewer system.

(3) Notification. Each user charge system must provide that each user be notified, at least annually, in conjunction with a regular bill, of the rate and that portion of the user charges or ad valorem taxes which are attributable to wastewater treatment services.

(4) Financial Management System. Each user charge system must include an adequate financial management system that will accurately account for revenues generated by the system and expenditures for operation and maintenance (including replacement) of the treatment system.

(5) Charges for Operation and Maintenance for Extraneous Flows. The user charge system shall provide that the costs of operation and maintenance for all flow not directly attributable to users (i.e., infiltration/inflow) be distributed among all users based upon either of the following:

(A) in the same manner that it distributes the costs for their actual use; or

(B) under a system which uses one or any combination of the following factors on a reasonable basis:

(i) flow volume of the users;

(ii) land area of the users;

(iii) number of hookups or discharges of the users; or

(iv) property valuation of the users, if the municipality has an approved user charge system based on ad valorem taxes.

(6) Adoption of System. One or more municipal legislative enactments or other appropriate authority must incorporate the user charge system. If the project is a treatment system accepting wastewaters from other municipalities, the subscribers receiving waste treatment services from the municipality shall adopt user charge systems in accordance with this section. These user charge systems shall also be incorporated in appropriate municipal legislative enactments or other appropriate authority of all municipalities contributing wastes to the pollution abatement facilities. Grant payments shall not exceed 90% of the total construction grant award until the municipality has adopted the approved user charge system.

(7) Implementation of System. The municipality shall implement its user charge system before the pollution abatement facility is placed in operation.

(f) **Sewer Use Ordinance.**

(1) Each municipality applying for funding assistance shall demonstrate to the satisfaction of the Commissioner that a sewer use ordinance or other legally binding requirement has been or will be enacted and will be enforced in each jurisdiction served by the pollution abatement facility before the completion of construction. The ordinance shall prohibit any new connections from inflow sources into the sanitary sewer portions of the pollution abatement facility; shall insure that new sewers and connections to the pollution abatement facility are properly designed and constructed; and shall require that all wastewaters introduced into the pollution abatement facility will not contain toxics or other pollutants in amounts or concentrations that endanger public safety or the physical integrity of the pollution abatement facility, cause violation of the conditions of any permit issued by the Commissioner, or preclude the selection of the most cost-effective alternative for wastewater treatment and sludge disposal.

(2) Grant payments shall not exceed 50% of the total construction grant award until the municipality has submitted a copy of its sewer use ordinance to the Commissioner for review.

(3) Grant payments shall not exceed 90% of the total construction grant award until the municipality's sewer use ordinance has been approved by the Commissioner and enacted by the municipality.

(4) The municipality shall adopt and implement its sewer use ordinance before the pollution abatement facility is placed in operation.

(g) **Infiltration/Inflow.**

(1) General. The municipality shall demonstrate to the Commissioner's satisfaction that each sewer system discharging into the proposed pollution abatement facility is not, or will not, be subject to excessive infiltration/inflow. For combined sewers, inflow is not considered excessive in any event.

(2) Inflow. If the rainfall induced peak inflow rate results or will result in chronic operational problems during storm events, the municipality shall perform a study of the sewer system to determine the quantity of excessive inflow and to propose a rehabilitation program to eliminate the excessive inflow. All cases in which pollution abatement facilities are planned for the specific storage and/or treatment of inflow shall be subject to a cost-effective analysis.

(3) Infiltration.

(A) If the flow rate at the existing pollution abatement facility is 150 gallons per capita per day or less during periods of high groundwater, the municipality shall build the project including sufficient capacity to transport and treat any existing infiltration. However, if the municipality believes any specific portion of its sewer system is subject to excessive infiltration, the municipality may confirm its belief in a cost-effective analysis and propose a sewer rehabilitation program to eliminate that specific excessive infiltration.

(B) If the flow rate at the existing pollution abatement facility is significantly more than 150 gallons per capita per day during periods of high groundwater, the municipality shall

perform a study of the sewer system to determine the quantity of excessive infiltration and to propose a sewer rehabilitation program to eliminate the excessive infiltration.

(C) If the flow rate at the existing pollution abatement facility is not significantly more than 150 gallons per capita per day, the municipality may request the Commissioner to determine that the project may proceed without further study.

(D) The Commissioner may authorize the municipality to perform minor sewer system rehabilitation concurrently with the sewer system evaluation survey if there is no adverse environmental impact. Rehabilitation which would be a part of the municipality's normal operation and maintenance responsibilities shall not be fundable.

(h) **Reserve Capacity.** The Commissioner will limit grant assistance for reserve capacity in pollution abatement facilities as follows:

(1) no grant shall be made to provide reserve capacity for a project for secondary or more stringent treatment or new interceptors and appurtenances. Grants for such projects shall be based on capacity necessary to serve existing needs as determined on the date of award of the construction grant and shall be consistent with the definition for eligible capacity established for the Federal Construction Grants Program in 40 CFR 35.2123; and

(2) the Commissioner shall require the construction of reasonable reserve capacity.

(Effective March 5, 1992)

Sec. 22a-482-4. Administrative program elements

(a) **Allowable Grant Costs.** Those costs associated with the planning, design and construction of pollution abatement facilities eligible for state grant assistance are as follows:

(1) costs of salaries, benefits, and expendable materials the municipality incurs for the project, except as provided for in subdivision (b) (8) of this section;

(2) costs under construction contracts;

(3) professional and consultant services;

(4) engineering report costs directly related to the pollution abatement facility;

(5) sewer system evaluation;

(6) project feasibility and related engineering reports;

(7) costs of complying with the Connecticut Environmental Policy Act, section 22a-1a to 22a-1h of the General Statutes, including costs of public notices and hearings;

(8) preparation of construction drawings, specifications, estimates and construction contract documents;

(9) reasonable landscaping;

(10) materials acquired, consumed, or expended specifically for the project;

(11) shop equipment installed at the pollution abatement facility necessary to the operation of the facility;

(12) a reasonable inventory of laboratory chemicals and supplies necessary to initiate plant operations;

(13) development and preparation of a preliminary and final plan of operation and an

operation and maintenance manual;

(14) start-up services for new pollution abatement facilities;

(15) project identification signs;

(16) costs of complying with the procurement requirements of this section;

(17) the costs of technical services for assessing the merits of or negotiating the settlement of a claim by or against the municipality provided;

(A) a formal grant amendment is executed specifically covering the costs before they are incurred;

(B) the costs are not incurred to prepare documentation that should be prepared by the contractor to support a claim against the municipality; and

(C) the Commissioner determines that there is a significant state interest in the issues involved in the claim;

(18) change orders and the costs of meritorious contractor claims for increased costs, provided the costs are not caused by the municipality's mismanagement or vicarious liability for the improper action of others. Settlements, arbitration awards, and court judgments which resolve contractor claims shall be reviewed by the Commissioner and shall be allowable only to the extent they are not caused by municipality mismanagement, are reasonable, and do not attempt to pass on to the State of Connecticut the costs of events that were the responsibility of the municipality, contractor or others;

(19) costs necessary to mitigate only direct, adverse, or physical impacts resulting from the building of the pollution abatement facility;

(20) the cost of groundwater monitoring facilities necessary to determine the possibility of groundwater deterioration, depletion or modification resulting from the project;

(21) for individual and small community systems, allowable costs which include:

(A) the cost of major rehabilitation, upgrading, enlarging and installing small and onsite systems, but in the case of privately owned systems, only for principal residences;

(B) conveyance pipes from the property line to an offsite treatment unit which serves a cluster of buildings;

(C) treatment and treatment residue disposal portions of toilets with composting tanks, oil flush mechanisms, or similar in-house devices;

(D) treatment or pumping units from the incoming flange, when located on private property, and conveyance pipes, if any, to the collector sewer; and

(E) the cost of restoring individual system building sites to their original condition;

(22) necessary safety equipment applicable to federal, state and local requirements;

(23) a portion of the costs of collection system maintenance equipment, as determined by the Commissioner;

(24) the cost of mobile equipment necessary for the operation of the overall pollution abatement facility, transmission of wastewater or sludge, or for the maintenance of equipment. These items include:

(A) portable stand-by generators;

(B) large portable emergency pumps to provide "pump-around" capability in the event

of a pump station failure or pipeline breaks; and

(C) sludge or septic tank trucks, trailers, and other vehicles having as their sole purpose the transportation of liquid or dewatered wastes from the collector point (including individual or on-site systems) to the pollution abatement facility or disposal site;

(25) replacement parts identified and approved in advance by the Commissioner as necessary to assure uninterrupted operation of the pollution abatement facility, provided they are critical parts or major system components which are:

(A) not immediately available or whose procurement involves an extended "lead-time";

(B) identified as critical by the equipment supplier(s); or

(C) critical but not included in the inventory provided by the equipment supplier(s);

(26) allowable costs for infiltration/inflow which include:

(A) the cost of sewer system and pollution abatement facility capacity adequate to transport and treat nonexcessive infiltration/inflow; and

(B) the costs of sewer system rehabilitation necessary to eliminate excessive infiltration/inflow as determined in a sewer system evaluation survey under section 22a-482-3 (g);

(27) the costs of royalties for the use of rights in a patented process or product with the prior approval of the Commissioner;

(28) the cost of legal and engineering services incurred by the municipality in deciding procurement protests and defending their decisions in protest appeals with the prior approval of the Commissioner;

(29) the cost of the services of the prime engineer required under subdivision (p) (10) of this section during the first year following initiation of operation of the pollution abatement facility; and

(30) the costs of municipal employees attending training workshops or seminars that are necessary to provide instruction in administrative, fiscal or contracting procedures required to complete the construction of the pollution abatement facility, if approved in advance by the Commissioner.

(b) **Unallowable Grant Project Costs.** Costs which are not necessary for the construction of a pollution abatement facility are unallowable. Such costs include, but are not limited to:

(1) basin or areawide planning not directly related to the project;

(2) bonus payments not legally required for completion of construction before a contractual completion date;

(3) personal injury compensation or damage arising out of the project whether determined by arbitration, negotiation, or otherwise;

(4) unallowable costs for small and onsite systems which include:

(A) modification to physical structure of homes or commercial establishments;

(B) conveyance pipes from the house to the treatment unit located on user's property; and

(C) wastewater generating fixtures such as commodes, sinks, tubs and drains;

(5) fines and penalties due to violations of, or failure to comply with, federal, state, or local laws and regulations;

(6) costs outside the scope of the approved project;

(7) approval, preparation, issuance and sale of bonds or other forms of indebtedness required to finance the project, and the interest on them;

(8) ordinary operating expenses of local government, such as salaries and expenses of a mayor, city council members, or city attorney, except as provided in subdivision (h) (13) of this section;

(9) the costs of acquisition (including associated level, administrative, and engineering) of sewer rights-of-way, pollution abatement facility sites (including small systems sites), sanitary landfill sites and sludge disposal sites, except as provided in subsection (c) of this section;

(10) costs for which payment has been or will be received under any federal assistance program;

(11) the cost of vehicles used primarily for transportation, such as pickup trucks;

(12) costs of equipment or materials acquired in violation of the procurement provisions of this section;

(13) the cost of furnishings including draperies, furniture and office equipment;

(14) the cost of ordinary site and building maintenance equipment, such as lawn mowers, snowblowers and vacuum cleaners;

(15) costs of monitoring equipment used by industry for sampling and analysis of industrial discharges to a municipal pollution abatement facility;

(16) construction of privately-owned pollution abatement facilities, including pretreatment facilities, except for individual systems;

(17) preparation of applications, including a plan of study and permits required by federal, state or local laws and regulations;

(18) administrative, engineering and legal activities associated with the establishment of special departments, agencies, commissions, regions, districts or other units of government;

(19) the cost of a pollution abatement facility or any part thereof that would provide capacity for new habitation or other establishments to be located on environmentally sensitive land such as wetlands, floodplains, or prime agricultural lands;

(20) the costs of legal services of defending or negotiating the settlement of a claim by or against the municipality; and

(21) all incremental costs of delay due to the award of any significant subagreements for construction more than 12 months after the construction grant award.

(c) **Allowable Grant Project Costs, If Approved.**

(1) The cost (including associated legal, administrative and engineering costs) of land acquired in fee simple or by lease or easement that will be an integral part of the treatment process or that will be used for the ultimate disposal of residues resulting from such treatment provided the Commissioner approves it in the grant agreement. These costs

include:

(A) the cost of a reasonable amount of land, considering irregularities in application patterns, and the need for buffer areas, berms, and dikes;

(B) the cost of land acquired for a soil absorption system for a group of two or more homes:

(C) the cost of land acquired for composting or temporary storage of compost residues which result from wastewater treatment;

(D) the cost of land acquired for storage of treated wastewater in land treatment systems before land application; and

(E) the cost paid by the municipality for eligible land in excess of just compensation based on the appraised value, the municipality's record of negotiation or a condemnation proceeding, as determined by the Commissioner, shall be unallowable.

(2) The cost associated with the preparation of the pollution abatement facility site before, during and, to the extent agreed on in the grant agreement, after building. These costs include:

(A) the cost of demolition of existing structures on the pollution abatement facilities site (including rights-of-way), if building cannot be undertaken without such demolition;

(B) the cost of removal, relocation or replacement of utilities, for which the municipality is legally obligated to pay under section 22a-470 of the General Statutes; and

(C) the cost of restoring streets and rights-of-way to their original condition. The need for such restoration shall result directly from the construction and is generally limited to repaving the width of trench.

(3) The cost of acquiring all or part of existing publicly or privately owned pollution abatement facilities, provided all of the following criteria are met:

(A) the acquisition, in and of itself, considered apart from any upgrade, expansion or rehabilitation, provides new pollution control benefits;

(B) the acquired pollution abatement facility was not built with previous federal or state financial assistance; and

(C) the primary purpose of the acquisition is not the reduction, elimination, or redistribution of public or private debt.

(d) **Allowable Loan Project Costs:**

(1) all costs allowable for grant participation under subsections (a) and (c) of this section;

(2) all costs necessary to complete the project including land, legal, rights-of-way, interest and claim settlements;

(3) all costs associated with incremental capacity for growth; and

(4) those costs a reasonable business person would incur when operating his or her own business necessary to construct the project.

(e) **Unallowable Loan Project Costs:**

(1) costs associated with improvements to municipal or private property not related to pollution control;

(2) costs associated with the liability of other contractors and subcontractors; and

(3) costs associated with waste, fraud or abuse.

(f) **Required Provisions for Architectural/Engineering Contracts.**

(1) Subagreement Enforcement.

(A) Commissioner's Authority. At a municipality's request the Commissioner may provide technical and legal assistance in the administration and enforcement of any subagreement related to a pollution abatement facility for which state financial assistance was made and intervene in any civil action involving the enforcement of such subagreements, including subagreement disputes which are the subject of either arbitration or court action. Any assistance to be provided is at the discretion of the Commissioner and in a manner determined by him or her to best serve the public interest. Factors which the Commissioner may consider in determining whether to provide assistance include:

(i) available department resources;

(ii) planned or ongoing enforcement action;

(iii) the municipality's demonstration of good faith in attempting to resolve the contract matters at issue;

(iv) the municipality's adequate documentation of the need for assistance; and

(v) the state's interest in the contract matters at issue.

(B) Municipality Request. The municipality's request for technical or legal assistance should be submitted in writing and be accompanied by documentation adequate to inform the Commissioner of the nature and necessity of the requested assistance.

(C) Privity of Subagreement. The Commissioner's technical or legal involvement in any subagreement dispute will not make the Commissioner a party to any subagreement entered into by the municipality.

(D) Municipality Responsibility. The provision of technical or legal assistance under this section in no way releases the municipality from its obligations under sections 22a-482-1 to 22a-482-4, inclusive, or affects the Commissioner's right to take remedial action against a municipality that fails to carry out those obligations.

(2) Subagreement Provisions.

(A) Each subagreement shall include provisions defining a sound and complete agreement, including the:

(i) nature, scope, and extent of work to be performed;

(ii) time frame for performance;

(iii) total cost of the subagreement; and

(iv) payment provisions.

(B) All subagreements awarded in excess of $10,000 shall contain provisions requiring compliance with state and federal equal employment opportunity laws and regulations.

(3) Model Subagreement Clauses. Municipalities shall include subparagraphs (A) to (L), inclusive, of this subdivision or their equivalent in all subagreements for architectural or engineering services. (Municipalities may substitute other terms for "municipality" and "engineer" in their subagreements.)

(A) Supersession. The municipality and the engineer agree that this and other appropriate

clauses in this section, or their equivalent, apply to the state grant eligible work to be performed under this subagreement and that these clauses supersede any conflicting provisions of this subagreement.

(B) Privity of Subagreement. This subagreement is expected to be funded in part with funds from the State of Connecticut, Department of Environmental Protection (DEP). Neither the state nor any of its departments, agencies, or employees is or will be a party to this subagreement or any lower tier subagreement. This subagreement is subject to sections 22a-482-1 to 22a-482-4 of the Regulations of Connecticut State Agencies in effect on the date of the grant award for the project.

(C) Changes to Subagreement.

(i) The municipality may at any time, by written order, make changes within the general scope of this subagreement in the services or work to be performed. If such changes cause an increase or decrease in the engineer's cost or time required to perform any services under this agreement, whether or not changed by any order, an equitable adjustment shall be made and this subagreement shall be modified in writing. The engineer must assert any claim for adjustment under this clause in writing within 30 days from the date of receipt by the engineer of the notification of change, unless the municipality grants additional time before the date of final payment.

(ii) No services for which additional compensation will be charged by the engineer shall be furnished without the written authorization of the municipality.

(iii) In the event that there is a modification of the Commissioner's requirements relating to the services to be performed under this agreement after the date of execution of this agreement, the increased or decreased cost of performance of the services provided for in the agreement shall be reflected in an appropriate modification of this agreement.

(D) Termination of Subagreement.

(i) This subagreement may be terminated in whole or in part in writing by either party in the event of substantial failure by the other party to fulfill its obligations under this subagreement through no fault of the terminating party. However, no termination may be effected unless the other party is given not less than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate and an opportunity for consultation with the terminating party prior to termination.

(ii) This subagreement may be terminated in whole or in part in writing by the municipality for its convenience, provided that the engineer is given not less than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate and an opportunity for consultation with the terminating party prior to termination.

(iii) If termination for default is effected by the municipality, an equitable adjustment in the price provided for in this subagreement shall be made, but no amount shall be allowed for anticipated profit on unperformed services or other work and any payment due to the engineer at the time of termination may be adjusted to cover any additional costs to the municipality because of the engineer's default. If termination for default is effected by the

engineer; or if termination for convenience is effected by the municipality; the equitable adjustment shall include a reasonable profit for services or other work performed. The equitable adjustment for any termination shall provide for payment to the engineer for services rendered and expenses incurred prior to the termination, in addition to termination and settlement costs reasonably incurred by the engineer relating to commitments which had become firm prior to the termination.

(iv) Upon receipt of a termination action pursuant to subparagraphs (D) (i) or (D) (ii) of this subdivision, the engineer shall promptly discontinue all services affected (unless the notice directs otherwise) and deliver or otherwise make available to the municipality all data, drawings, specifications, reports, estimates, summaries and such other information and materials as may have been accumulated by the engineer in performing this subagreement, whether completed or in process.

(v) Upon termination under subparagraphs (D) (i) or (D) (ii) of this subdivision, the municipality may take over the work and may award another party a subagreement to complete the work under this subagreement.

(vi) If, after termination for failure of the engineer to fulfill contractual obligations, it is determined that the engineer had not failed to fulfill contractual obligations, the termination shall be deemed to have been for the convenience of the municipality. In such event, adjustment of the price provided for in this subagreement shall be made as provided in subparagraph (D) (iii) of this subdivision.

(E) Remedies. Except as may be otherwise provided in this subagreement, all claims, counter-claims, disputes, and other matters in question between the municipality and the engineer arising out of or relating to this subagreement, or the breach thereof, will be decided by arbitration, if the parties mutually agree, or in a court of competent jurisdiction within the district in which the municipality is located.

(F) Price Reduction for Defective Cost or Pricing Data (This clause is applicable if the amount of the agreement exceeds $100,000). The engineer warrants that cost and pricing data submitted for evaluation with respect to negotiation of prices for negotiated subagreements and lower tier subagreements is based on current, accurate, and complete data supported by books and records. If the municipality or Commissioner determines that any price, including profit, negotiated in connection with this subagreement, any lower tier subagreement, or any amendment thereunder was increased by any significant sums because the data provided was incomplete, inaccurate, or not current at the time of submission, then such price, cost or profit shall be reduced accordingly, and the subagreement shall be modified in writing to reflect such reduction.

(NOTE– Since the subagreement is subject to reduction under this clause by reason of defective cost or pricing data submitted in connection with certain subcontractors, the engineer may wish to include a clause in each such subcontract requiring the subcontractor to appropriately indemnify the engineer. It is also expected that any subcontractor subject to such indemnification will generally require substantially similar indemnification for defective cost or pricing data required to be submitted by lower tier subcontractors.)

(G) Audit; Access to Records.

(i) The engineer shall maintain books, records, documents, and other evidence directly pertinent to performance on grant work under this agreement in accordance with generally accepted accounting principles and practices consistently applied. The engineer shall also maintain the financial information and data used by the engineer in the preparation or support of the cost submission required for any negotiated subagreement or change order in effect on the date of execution of this agreement and a copy of the cost summary shall be submitted to the municipality. The municipality and Commissioner or any of his or her duly authorized representatives shall have access to all such books, records, documents, and other evidence for inspection, audit, and copying during normal business hours. The engineer will provide proper facilities for such access and inspection.

(ii) The engineer agrees to include subparagraphs (G) (i) to (G) (v) of this subdivision, inclusive, in all his contracts and all lower tier subcontracts directly related to project performance that are in excess of $10,000, and to make subparagraphs (G) (i) to (G) (v) of this subdivision, inclusive, applicable to all change orders directly related to project performance.

(iii) Audits conducted under this subparagraph shall be in accordance with generally accepted auditing standards and established procedures and guidelines of the reviewing or audit department and shall meet the requirements of section 7-396a of the General Statutes.

(iv) The engineer agrees to the disclosure of all information and reports resulting from access to records under subparagraphs (G) (i) and (G) (ii) of this subdivision to any of the parties referred to in subparagraph (G) (i) of this subdivision, provided that the engineer is afforded the opportunity for an audit exit conference and an opportunity to comment and submit any supporting documentation on the pertinent portions of the draft audit report and that the final audit report will include written comments of reasonable length, if any, of the engineer.

(v) The engineer shall maintain and make available records under subparagraphs (G) (i) and (G) (ii) of this subdivision during performance on grant funded work under this agreement and until three (3) years from the date of final grant payment for the project. In addition, those records which relate to any dispute appeal arising under a grant agreement, to litigation, to the settlement of claims arising out of such performance, or to costs or items to which an audit exception has been taken, shall be maintained and made available until three (3) years after the date of resolution of such appeal, litigation, claim, or exception.

(H) Covenant Against Contingent Fees. The engineer warrants that no person or selling agency has been employed or retained to solicit or secure this subagreement upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, except bona fide employees or bona fide established commercial or selling agencies maintained by the engineer for the purpose of securing business. For breach or violation of this warranty the municipality shall have the right to annul this agreement without liability or, in its discretion, to deduct from the contract price or consideration, or otherwise recover, the full amount of such commission, percentage, brokerage, or contingent fee.

(I) Gratuities.

(i) If the municipality finds after a notice and hearing that the engineer, or any of the engineer's agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of the municipality or the state, in an attempt to secure a subagreement or favorable treatment in awarding, amending, or making any determinations related to the performance of this agreement, the municipality may, by written notice to the engineer, terminate this agreement. The municipality may also pursue other rights and remedies that the law or this subagreement provides. However, the existence of the facts on which the municipality bases such findings shall be in issue and may be reviewed in proceedings under subparagraph (E) of this subdivision.

(ii) In the event this subagreement is terminated as provided in subparagraph (I) (i) of this subdivision the municipality may pursue the same remedies against the engineer as it could pursue in the event of a breach of the subagreement by the engineer and, as a penalty, in addition to any other damages to which it may be entitled by law, may pursue exemplary damages in an amount (as determined by the municipality) which shall be not less than three, nor more than ten times the costs the engineer incurs in providing any such gratuities to any such officer or employee.

(J) Responsibility of the Engineer.

(i) The engineer shall be responsible for the professional quality, technical accuracy, timely completion, and the coordination of all designs, drawings, specifications, reports, and other services furnished by the engineer under this subagreement. The engineer shall, without additional compensation, correct or revise any errors, omissions, or other deficiencies in his designs, drawings, specifications, reports, and other services.

(ii) The engineer shall perform the professional services necessary to accomplish the work required to be performed under this subagreement, in accordance with this subagreement and applicable requirements of the Commissioner in effect on the date of execution of the assistance agreement for this project.

(iii) Approval by the municipality or the Commissioner of drawings, designs, specifications, reports, and incidental work or materials furnished hereunder shall not, in any way, relieve the engineer of responsibility for the technical adequacy of his work. Neither the municipality's nor Commissioner's review, approval, acceptance, or payment for any of the services shall be construed as a waiver of any rights under this subagreement or of any cause of action arising out of the performance of this subagreement.

(iv) The engineer shall be and shall remain liable, in accordance with applicable law, for all damages to the municipality or the state caused by the engineer's negligent performance of any of the services furnished under this subagreement, except for errors, omissions, or other deficiencies to the extent attributable to the municipality, municipality-furnished data, or any third party. The engineer shall not be responsible for any time delays in the project caused by circumstances beyond the engineer's control.

(v) The engineer's obligations under this subparagraph are in addition to the engineer's other expressed or implied warranties under this subagreement or state law and in no way

diminish any other rights that the municipality may have against the engineer for faulty materials, equipment, or work.

(K) Payment.

(i) Payment shall be made in accordance with the payment schedule incorporated in this subagreement, as soon as practicable, upon submission of statements requesting payment by the engineer to the municipality. If no such payment schedule is incorporated in this subagreement, the payment provisions of subparagraph (K) (ii) of this subdivision shall apply.

(ii) The engineer may request monthly progress payments and the municipality shall make them, as soon as practicable, upon submission of statements requesting payment by the engineer to the municipality. When such progress payments are made, the municipality may withhold up to ten (10) percent of the vouchered amount until satisfactory completion by the engineer of work and services within a step called for under this subagreement. When the municipality determines that the work under this subagreement, or any specified task hereunder, is substantially complete and that the amount of retained percentages is in excess of the amount considered by the municipality to be adequate for its protection, it shall release to the engineer such excess amount.

(iii) No payment request made under subparagraph (K) (i) or (K) (ii) of this subdivision shall exceed the estimated amount and value of the work and services performed by the engineer under this subagreement. The engineer shall prepare the estimates of work performed and shall supplement them with such supporting data as the municipality may require.

(iv) Upon satisfactory completion of the work performed under this subagreement, as a condition precedent to final payment under this subagreement or to settlement upon termination of the subagreement, the engineer shall execute and deliver to the municipality a release of all claims against the municipality arising under or by virtue of this subagreement, other than such claims, if any, as may be specifically exempted by the engineer from the operation of the release in stated amounts to be set forth therein.

(L) Copyrights and Rights in Data.

(i) The engineer agrees that any plans, drawings, designs, specifications, computer programs (which are substantially financed by state funds), technical reports, operating manuals, and other work submitted with an engineering report, with a design or for construction with financing assistance, or which are specified to be delivered under this subagreement, or which are developed or produced and paid for under this subagreement (referred to in subparagraph (L) (ii) of this subdivision as "subject data"), and including all raw data obtained or generated by the engineer during the course of his work under this subagreement, are subject to certain rights in the United States. These rights include the right to use, duplicate, and disclose such subject data, in whole or in part, in any manner for any purpose whatsoever, and to have others do so. If the material is copyrightable, the engineer may copyright it, subject to the rights of the state described herein, but the municipality and the state reserve a royalty-free, nonexclusive, and irrevocable license to

reproduce, publish, and use such materials, in whole or in part, and to authorize others to do so. The engineer shall include appropriate provisions to achieve the purpose of this condition in all subcontracts expected to produce copyrightable subject data; and

(ii) all such subject data furnished by the engineer pursuant to this subagreement are instruments of his services in respect to the project. It is understood that the engineer does not represent such subject data to be suitable for reuse on any other project or for any other purpose. If the municipality reuses the subject data without the engineer's specific written verification or adaptation, such reuse will be at the risk of the municipality without liability to the engineer. Any such verification or adaptation will entitle the engineer to further compensation at rates agreed upon by the municipality and the engineer.

(g) **Required Provisions for Construction Contracts.** Municipalities must include, when appropriate, subdivisions (1) to (14), inclusive, of this subsection, or their equivalent, in each subagreement and may substitute other terms for "grantee" and "contractor" in their subagreements.

(1) Supersession. The municipality and the contractor agree that the following general provisions, or their equivalent, apply to eligible work to be performed under this contract and that these provisions supersede any conflicting provisions of this contract.

(2) Privity of Contract. This contract is expected to be funded in part by the State of Connecticut. Neither the state, nor any of its departments, agencies, or employees is or will be a party to this contract or any lower tier subcontract. This contract is subject to sections 22a-482-1 to 22a-482-4, inclusive, of the Regulations of Connecticut State Agencies.

(3) Changes for Contracts for Construction.

(A) The municipality may, at any time, without notice to any surety, by written order designated or indicated to be a change order, make any change in the work within the general scope of the subagreement, including but not limited to changes:

(i) in the specifications (including drawings and designs);

(ii) in the time, method, or manner of performance of the work;

(iii) in the municipality-furnished facilities, equipment, materials, services, or site; or

(iv) directing acceleration in the performance of the work.

(B) A change order shall also be any other written or oral order (including direction, instruction, interpretation or determination) from the municipality which causes any change, provided the contractor gives the municipality written notice stating the date, circumstances, and source of the order and that the contractor regards the order as a change order.

(C) Except as provided in subdivision (3) of this subsection, no order, statement, or conduct of the municipality shall be treated as a change under subdivision (3) of this subsection or entitle the contractor to an equitable adjustment.

(D) If any change under subdivision (3) of this subsection causes an increase or decrease in the contractor's cost or the time required to perform any part of the work under this contract, whether or not changed by any order, an equitable adjustment shall be made and the subagreement modified in writing. However, for claims based on defective specifications, no claim for any change under subparagraph (B) of this subdivision shall be

allowed for any costs incurred more than 20 days before the contractor gives written notice as required in subparagraph (B) of this subdivision. In the case of defective specifications for which the municipality is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the contractor in attempting to comply with those defective specifications.

(E) If the contractor intends to assert a claim for an equitable adjustment under this clause, he shall, within thirty (30) days after receipt of a written change order under subparagraph (A) of this subdivision, or the furnishing of a written notice under subparagraph (B) of this subdivision, submit to the grantee a written statement setting forth the general nature and monetary extent of such claim. The municipality may extend the 30-day period. The statement of claim may be included in the notice under subparagraph (B) of this subdivision.

(F) No claim by the contractor for an equitable adjustment shall be allowed if made after final payment under this contract.

(4) Changes for Contracts for Supplies.

(A) The municipality may at any time, by a written order and without notice to the sureties, make changes within the general scope of this subagreement in any one or more of the following:

(i) drawings, designs, or specifications, where the supplies to be furnished are to be specially manufactured for the municipality;

(ii) method of shipment or packing; and (iii) place of delivery.

(B) If any change causes an increase or decrease in the cost or the time required to perform any part of the work under this subagreement, whether or not changed by any such order, an equitable adjustment shall be made in the subagreement price or delivery schedule, or both, and the subagreement shall be modified in writing. Any claim by the contractor or adjustment under this clause shall be asserted within thirty (30) days from the date of receipt by the contractor of the notification of change. lf the municipality decides that the facts justify such action, the municipality may receive and act upon any such claim asserted at any time before final payment under this subagreement. Where the cost of property is made obsolete or excessive as a result of a change is included in the contractor's claim for adjustment, the grantee shall have the right to prescribe the manner of disposition of such property. Nothing in this subdivision shall excuse the contractor from proceeding with the subagreement as changed.

(5) Differing Site Conditions.

(A) The contractor shall promptly, and before such conditions are disturbed, notify the municipality in writing of:

(i) subsurface or latent physical conditions at the site differing materially from those indicated in this subagreement; or

(ii) unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this subagreement. The municipality shall promptly investigate

the conditions and, if it finds that conditions are materially different and will cause an increase or decrease in the contractor's cost or the time required to perform any part of the work under this subagreement, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the subagreement modified in writing.

(B) No claim of the contractor under this subdivision shall be allowed unless the contractor has given notice required in subparagraph (A) of this subdivision. However, the municipality may extend the prescribed time.

(C) No claim by the contractor for an equitable adjustment shall be allowed if asserted after final payment under this subagreement.

(6) Suspension of Work.

(A) The municipality may order the contractor, in writing, to suspend, delay, or interrupt all or any part of the work for such period of time as the municipality may determine to be appropriate for the convenience of the municipality.

(B) If the performance of all or any part of the work is suspended, delayed, or interrupted for an unreasonable period of time by an act of the municipality in administration of the contract, (or if no time is specified, within a reasonable time), an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing. However, no adjustment shall be made under this subdivision for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the contractor, or for which an equitable adjustment is provided for, or excluded, under any other provision of the contract.

(C) No claim under this subdivision shall be allowed for any costs incurred more than twenty (20) days before the contractor notified the municipality in writing of the act or failure to act involved (this requirement does not apply to a claim resulting from a suspension order), and unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of such suspension, delay, or interruption, but not later than the date of final payment under the contract.

(7) Termination.

(A) This contract may be terminated in whole or in part in writing by either party in the event of substantial failure by the other party to fulfill its obligations under this subagreement through no fault of the terminating party, provided that no termination may be effected unless the other party is given not less than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate and an opportunity for consultation with the terminating party prior to termination.

(B) This contract may be terminated in whole or in part in writing by the municipality for its convenience, provided that the contractor is given not less than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate and an opportunity for consultation with the terminating party prior to termination.

(C) If termination for default is effected by the municipality, an equitable adjustment in

the price provided for in this contract shall be made but no amount shall be allowed for anticipated profit on unperformed services or other work, and any payment due to the contractor at the time of termination may be adjusted to cover any additional costs to the municipality because of the contractor's default. If termination for default is effected by the contractor, or if termination for convenience is effected by the municipality, the equitable adjustment shall include a reasonable profit for services or other work performed. The equitable adjustment for any termination shall provide for payment to the contractor for services rendered and expenses incurred prior to the termination in addition to termination settlement costs reasonably incurred by the contractor relating to commitments which had become firm prior to the termination.

(D) Upon receipt of a termination action pursuant to subparagraphs (A) or (B) of this subdivision, the contractor shall promptly discontinue all services affected (unless the notice directs otherwise), and deliver or otherwise make available to the municipality all data, drawings, specifications, reports, estimates, summaries and such other information and materials as may have been accumulated by the contractor in performing this contract whether completed or in process.

(E) Upon termination under subparagraphs (A) or (B) of this subdivision the municipality may take over the work and may award another party a contract to complete the work under this contract.

(F) If, after termination for failure of the contractor to fulfill contractual obligations, it is determined that the contractor had not failed to fulfill contractual obligations, the termination shall be deemed to have been for the convenience of the municipality. In such event, adjustment of the price provided for in this contract shall be made as provided in subparagraph (C) of this subdivision.

(8) Remedies. Except as may be otherwise provided in this contract, all claims, counter-claims, disputes, and other matters in question between the municipality and the contractor arising out of or relating to this contract or the breach thereof will be decided by arbitration, if the parties mutually agree, or in a court of competent jurisdiction within the district in which the municipality is located.

(9) Price Reduction for Defective Cost or Pricing Data.

NOTE– This subdivision is applicable to any contract negotiated between the municipality and its contractor in excess of $500,000; negotiated change orders in excess of $500,000 or 10 percent of the contract, whichever is less, affecting the price of a formally advertised, competitively awarded, fixed price contract; or any lower tier subcontract or purchase order in excess of $500,000 or 10 percent of the assistance agreement, whichever is less, under a contract other than a formally advertised, competitively awarded, fixed price subagreement. This subdivision is not applicable for contracts to the extent that they are awarded on the basis of effective price competition.

The contractor and subcontractor, where appropriate, warrant that cost and pricing data submitted for evaluation with respect to negotiation of prices for negotiated contracts, lower tier subcontracts and change orders is based on current, accurate, and complete data

supported by their books and records. If the municipality or the Commissioner determines that any price (including profit) negotiated in connection with this contract, any lower tier subcontract, or any amendment thereunder was increased by any significant sums because the data provided was incomplete, inaccurate, or not current at the time of submission, then such price, cost, or profit shall be reduced accordingly, and the contract shall be modified in writing to reflect such reduction. Failure to agree on a reduction shall be subject to subdivision (8) of this subsection.

NOTE– Since the contract is subject to reduction under this subdivision by reason of defective cost or pricing data submitted in connection with lower tier subcontracts, the contractor may wish to include a clause in each lower tier subcontract requiring the lower tier subcontractor to appropriately indemnify the contractor. It is also expected that any lower tier subcontractor subject to such indemnification will generally require substantially similar indemnification for defective cost or pricing data required to be submitted by lower tier subcontractors.

(10) Audit; Access to Records.

(A) The contractor shall maintain books, records, documents, and other evidence directly pertinent to performance on grant work under this contract in accordance with generally accepted accounting principles and practices consistently applied. The contractor shall also maintain the financial information and data used by the contractor in the preparation or support of the cost submission required under section 22a-482-4 (i) (6) for any negotiated contract or change order and a copy of the cost summary submitted to the municipality. The municipality and the Commissioner or any of his or her authorized representatives shall have access to all such books, records, documents, and other evidence for the purpose of inspection, audit and copying during normal business hours. The contractor will provide proper facilities for such access and inspection.

(B) If this is a formally advertised, competitively awarded, fixed price contract, the contractor agrees to make subparagraphs (A) to (F), inclusive, of this subdivision applicable to all negotiated change orders and contract amendments affecting the contract price. In the case of all other types of prime contracts, the contractor agrees to include subparagraphs (A) to (F), inclusive, of this subdivision in all his subcontracts in excess of $10,000 and to subparagraphs (A) through (F), inclusive, of this subdivision applicable to all change orders directly related to project performance.

(C) Audits conducted under this subdivision shall be in accordance with generally accepted auditing standards and established procedures and guidelines of the reviewing or audit departments and shall meet the requirements of section 7-396a of the General Statutes.

(D) The contractor agrees to disclose all information and reports resulting from access to records under subparagraphs (A) and (B) of this subdivision to any of the parties referred to in subparagraph (A) of this subdivision.

(E) Records under subparagraphs (A) and (B) of this subdivision shall be maintained and made available during performance on assisted work under this contract and until three years from the date of final state payment for the project. In addition, those records which

relate to any dispute appeal arising under a grant assistance agreement, to litigation, to the settlement of claims arising out of such performance, or to costs or items to which an audit exception has been taken, shall be maintained and made available until three years after the date of resolution of such appeal, litigation, claim, or exception.

(F) This right of access provision (with respect to financial records) applies to:

(i) negotiated prime subagreements:

(ii) negotiated change orders or contract amendments in excess of $10,000 affecting the price of any formally advertised, competitively awarded, fixed price contract; and

(iii) subcontracts or purchase orders under any contract other than a formally advertised, competitively awarded, fixed price contract. However, this right of access does not apply to a prime contract, lower tier subcontract, or purchase order awarded after effective price competition, except with respect to records pertaining directly to contract performance, (excluding any financial records of the contractor), if there is any indication that fraud, gross abuse, or corrupt practices may be involved or if the contract is terminated for default or for convenience.

(11) Covenant Against Contingent Fees. The contractor warrants that no person or selling agency has been employed or retained to solicit or secure this contract upon an agreement or understanding for a commission, percentage, brokerage, or contingent fee, excepting bona fide employees or bona fide established commercial or selling agencies maintained by the contractor for the purpose of securing business. For breach or violation of this warranty the grantee shall have the right to annul this agreement without liability or, at its discretion, to deduct from the contract price or consideration, or otherwise recover the full amount of such commission, percentage, brokerage, or contingent fee.

(12) Gratuities.

(A) If the municipality finds, after a notice and hearing, that the contractor, or any of the contractor's agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of the municipality or the state, in an attempt to secure a contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this agreement, the municipality may, by written notice to the contractor, terminate this agreement. The municipality may also pursue other rights and remedies that the law or this agreement provides. However, the existence of the facts on which the municipality bases such findings shall be in issue and may be reviewed in proceedings under subdivision (8) of this subsection.

(B) In the event this contract is terminated, as provided in subparagraph (A) of this subdivision, the municipality may pursue the same remedies against the contractor as it could pursue in the event of a breach of the contract by the contractor and, as a penalty, in addition to any other damages to which it may be entitled by law, may pursue exemplary damages in an amount (as determined by the grantee) which shall be not less than three nor more than ten times the costs the contractor incurs in providing any such gratuities to any such officer or employee.

(13) Responsibility of the Contractor.

(A) The contractor agrees to perform all work under this agreement in accordance with this agreement's designs, drawings, and specifications.

(B) The contractor warrants and guarantees for a period of one (1) year from the date of substantial completion of the system that the completed system is free from all defects due to faulty materials, equipment or workmanship; and the contractor shall promptly make whatever adjustments or corrections necessary to cure such defects, including repairs of any damage to other parts of the system resulting from such defects. The municipality shall give notice to the contractor of observed defects with reasonable promptness. In the event that the contractor fails to make adjustments, repairs, corrections or other work that may be made necessary by such defect, the municipality may do so and charge the contractor the cost incurred. The performance bond shall remain in full force and effect through the guarantee period.

(C) The contractor's obligations under this subdivision are in addition to the contractor's other express or implied warranties under this agreement or state law and in no way diminish any other rights that the municipality may have against the contractor for faulty material, equipment, or work.

(14) Final Payment. Upon satisfactory completion of the work performed under this agreement, as a condition before final payment under this agreement, or as a termination settlement under this agreement, the contractor shall execute and deliver to the municipality a release of all claims against the municipality arising under or by virtue of this agreement, except claims which are specifically exempted by the contractor to be set forth therein. Unless otherwise provided in this agreement or by state law or otherwise expressly agreed to by the parties to this agreement, final payment under this agreement or settlement upon termination of this agreement shall not constitute a waiver of the municipality's claims against the contractor or his sureties under this agreement or applicable performance and payment bonds.

(h) **Procurement Requirements—General.**

(1) Applicability. This subsection defines the responsibilities of the state and the municipality and the minimum procurement standards for each municipality's procurement system.

(2) Municipality Responsibility.

(A) The municipality is responsible for the settlement and satisfactory completion, in accordance with sound business judgment and good administrative practice, of all contractual and administrative issues arising out of subagreements entered into under the assistance agreement. This includes issuance of invitations for bids or requests for proposals, selection of contractors, award of subagreements, settlement of protests, claims, disputes and other related procurement matters.

(B) The municipality shall maintain a subagreement administration system to assure that contractors perform in accordance with the terms, conditions and specifications of their subagreements.

(C) The municipality shall review its proposed procurement actions to avoid purchasing

unnecessary or duplicative items.

(D) The municipality shall consider consolidating its procurement or dividing it into parts to obtain a more economical purchase.

(E) Where appropriate, the municipality shall make an analysis of lease versus purchase alternatives in its procurement actions.

(F) A municipality may request technical assistance from the Commissioner for the administration and enforcement of any subagreement awarded under this section. However, such assistance does not relieve the municipality of its responsibilities under this section, 22a-482-4.

(G) A municipality may use innovative procurement methods or procedures only if it receives the Commissioner's prior written approval.

(3) Municipality Reporting Requirements. The municipality shall request, in writing, the Commissioner's authorization to award each construction subagreement which has an aggregate value over $10,000. The request shall include:

(A) name, address, telephone number and employee identification number of the construction contractor;

(B) amount of the award;

(C) estimated starting and completion dates;

(D) project number, name and site location of the project; and

(E) copy of the tabulations of bids or offers and the name of each bidder or offeror.

(4) Copies of Contract Documents. The municipality shall promptly submit to the Commissioner copies of any prime contract or modification thereof, and revisions to plans and specifications.

(5) Limitations on Subagreement Award.

(A) The municipality shall award subagreements only to responsible contractors that possess the potential ability to perform successfully under the terms and conditions of a proposed procurement. A responsible contractor is one that has:

(i) financial resources, technical qualifications, experience, an organization and facilities adequate to carry out the project, or a demonstrated ability to obtain these;

(ii) resources to meet the completion schedule contained in the subagreement;

(iii) a satisfactory performance record for completion of subagreements;

(iv) accounting and auditing procedures adequate to control property, funds and assets; and

(v) demonstrated compliance or willingness to comply with the civil rights, equal employment opportunity, labor laws and other statutory requirements.

(B) The municipality shall not make awards to contractors who have been suspended or debarred by a Connecticut state agency.

(6) Violations. The municipality shall refer violations of law to the local or state officials having the proper jurisdiction.

(7) Competition.

(A) The municipality shall conduct all procurement transactions in a manner that

provides maximum open and free competition.

(B) Procurement practices shall not unduly restrict or eliminate competition. Examples of practices considered to be unduly restrictive include:

(i) noncompetitive practices between firms;

(ii) organizational conflicts of interest;

(iii) unnecessary experience and bonding requirements;

(iv) local laws, ordinances, regulations or procedures which give local bidders or proposers preference over other bidders or proposers in evaluating bids or proposals; and

(v) placing unreasonable requirements on firms in order for them to qualify to do business.

(C) The municipality may use a prequalification list(s) of persons, firms or products if it:

(i) updates its prequalified list(s) at least every six months;

(ii) reviews and acts on each request for prequalification made more than thirty (30) days before the closing date for receipt of proposals or bid opening; and

(iii) gives adequate public notice of its prequalification procedures in accordance with the public notice procedures.

(D) A municipality may not use a prequalified list(s) of persons or firms if the procedure unnecessarily restricts competition.

(8) Profit.

(A) Municipalities shall assure that only fair and reasonable profits are paid to contractors awarded subagreements under state assistance agreements.

(B) The municipality shall negotiate profit as a separate element of price for each subagreement in which there is no price competition or where price is based on cost analysis.

(C) Where the municipality receives two or more bids, profit included in a formally advertised, competitively bid, fixed price subagreement shall be considered reasonable.

(D) Off-the-shelf or catalog supplies are exempt from this subparagraph.

(9) Use of Small, Minority, and Women's Businesses. The municipality shall take affirmative steps to assure that small, minority, and women's businesses are used to the maximum extent practicable. The Commissioner may impose goals as conditions of financial assistance.

(10) Privity of Subagreement. The state shall not be a party to any subagreement nor to any solicitation or request for proposals.

(11) Documentation.

(A) Procurement records and files for procurements in excess of $10,000 shall include the following:

(i) the basis for contractor selection;

(ii) written justification for selection of the procurement method;

(iii) written justification for use of any specification which does not provide for maximum free and open competition;

(iv) written justification for the type of subagreement; and

(v) the basis for award cost or price, including a copy of the cost or price analysis made and documentation of negotiations; and

(B) The municipality shall state the reasons in writing for rejecting any or all bids and the justification for procurements on a noncompetitively negotiated basis and make them available for public inspection.

(12) Specifications.

(A) Nonrestrictive Specifications.

(i) No specification for bids or statement of work shall be written in such a manner as to contain proprietary, exclusionary or discriminatory requirements, other than those based upon performance, unless such requirements are necessary to test or demonstrate a specific thing or to provide for necessary interchangeability of parts and equipment, or at least two brand names or trade names of comparable quality or utility are listed and are followed by the words "or equal." If brand or trade names are specified, the municipality shall be prepared to identify to the Commissioner, or in any protest action, the salient requirements (relating to the minimum needs of the project) which shall be met by any offeror. The single base bid method of solicitation for equipment and parts for determination of a low, responsive bidder may not be utilized. With regard to materials, if a single material is specified, the municipality shall be prepared to substantiate the basis for the selection of the material.

(ii) Project specifications shall, to the extent practicable, provide for maximum use of structures, machines, products, materials, construction methods, and equipment which are readily available through competitive procurement or through standard or proven production techniques, methods, and processes.

(B) Sole Source Restriction. A specification shall not require the use of structures, materials, equipment, or processes which are known to be available only from a sole source, unless the Commissioner determines, in advance, that the municipality's engineer has adequately justified, in writing, that the proposed use meets the particular project's minimum needs or the Commissioner determines that use of a single source is necessary to promote innovation.

(C) Experience Clause Restriction. The general use of experience clauses requiring equipment manufacturers to have a record of satisfactory operation for a specified period of time or of bonds or deposits to guarantee replacement in the event of failure is restricted to special cases where the municipality's engineer adequately justifies any such requirement in writing. Where such justification has been made, submission of a bond or deposit shall be permitted instead of a specified experience period. The period of time for which the bond or deposit is required should not exceed the experience period specified.

(13) Force Account Work.

(A) The municipality shall receive the Commissioner's prior written approval for use of the force account method for any planning, design work or construction work, unless the grant agreement stipulates the force account method.

(B) The Commissioner may approve the force account method upon the municipality's

demonstration that it possesses the necessary competence required to accomplish such work and that the work can be accomplished more economically by use of the force account method or emergency circumstances dictate its use.

(C) Use of the force account method for construction work shall generally be limited to minor portions of a project.

(14) Code of Conduct.

(A) The municipality shall maintain a written code or standard of conduct which shall govern the performance of its officers, employees, or agents engaged in the award and administration of subagreements supported by state funds. No employee, officer or agent of the municipality shall participate in the selection, award or administration of a subagreement supported by state funds if a conflict of interest, real or apparent, would be involved.

(B) Such a conflict would arise when:

(i) any employee, officer or agent of the municipality, any member of the immediate families, or their partners, have a financial or other interest in the firm selected for award; or

(ii) an organization which may receive or has been awarded a subagreement employs, or is about to employ, any person under subparagraph (B) (i) of this subdivision.

(C) The municipality's officers, employees or agents shall neither solicit nor accept gratuities, favors or anything of monetary value from contractors, potential contractors or other parties to subagreements.

(D) Municipalities may set minimum rules where the financial interest is not substantial or the gift is an unsolicited item of nominal value.

(E) To the extent permitted by state or local law or regulations, the municipality's code of conduct shall provide for penalties, sanctions or other disciplinary actions for violations of the code by the municipality's officers, employees or agents or by contractors or their agents.

(15) Payment to Consultants.

(A) For all state assistance agreements, the state shall limit its participation in the salary rate (excluding overhead) paid to individual consultants retained by a municipality or by a municipality's contractors or subcontractors to the maximum daily rate for a GS-18 federal employee. (Municipality's may, however, pay contractors and subcontractors more than this amount.) This limitation applies to consultation services of designated individuals with specialized skills who are paid at a daily or hourly rate. The rate does not include transportation and subsistence costs for travel performed; municipalities shall pay these costs in accordance with their normal travel reimbursement practices.

(B) Subagreements with firms for services which are awarded using these procurement requirements are not affected by this limitation.

(16) Cost and Price Considerations.

(A) The municipality shall conduct a cost analysis of all negotiated change orders and all negotiated subagreements estimated to exceed $10,000.

(B) The municipality shall conduct a price analysis of all formally advertised procurements estimated to exceed $10,000, if there are fewer than three bidders.

(C) For negotiated procurement, contractors and subcontractors shall submit cost or pricing data in support of their proposals to the municipality.

(17) Small Purchases.

(A) Small Purchase Procurement. If the aggregate amount involved in any one procurement transaction does not exceed $10,000, including estimated handling and freight charges, overhead and profit, the municipality may use small purchase procedures.

(B) Small Purchase Procedures. Small purchase procedures are relatively simple procurement methods that are sound and appropriate for procurement of services, supplies or other property costing in the aggregate not more than $10,000.

(C) Requirements for Competition.

(i) Municipalities shall not divide a procurement into smaller parts to avoid the dollar limitation for competitive procurement.

(ii) Municipalities shall obtain price or rate quotations from an adequate number of qualified sources.

(18) Negotiation and Award of Subagreements.

(A) Unless the request for proposals states that an award may be based on initial offers alone, the municipality shall conduct meaningful negotiations with the best qualified offerors with acceptable proposals within the competitive range, and permit revisions to obtain best and final offers. The best qualified offerors shall have equal opportunities to negotiate or revise their proposals. During negotiations, the municipality shall not disclose the identity of competing offerors or any information from competing proposals.

(B) The municipality shall award the subagreement to the responsible offeror whose proposal is determined in writing to be the most advantageous to the municipality, taking into consideration price and other evaluation criteria set forth in the request for proposals.

(C) The municipality shall promptly notify unsuccessful offerors that their proposals were rejected.

(D) The municipality shall document its procurement file to indicate how proposals were evaluated, what factors were used to determine the best qualified offerors within the competitive range, and what factors were used to determine the subagreement award.

(19) Optional Selection Procedure for Negotiation and Award of Subagreements for Architectural and Engineering Services.

(A) The municipality may evaluate and select an architect or engineer using the procedures in this subdivision in place of the procedures in "Negotiation and Award of Subagreements" in subdivision (18) of this subsection.

(B) The municipality may use responses from requests for statements of qualifications to determine the most technically qualified architects or engineers.

(C) After selecting and ranking the most qualified architects or engineers, the municipality shall request technical proposals from those architects or engineers and inform them of the evaluation criteria the municipality will use to rank the proposals.

(D) The municipality shall then select and determine, in writing, the best technical proposal.

(E) After selecting the best proposal, the municipality shall attempt to negotiate fair and reasonable compensation with that offeror.

(F) If the municipality and the offeror of the best proposal cannot agree on the amount of compensation, the municipality shall formally terminate negotiations with that offeror. The municipality shall then negotiate with the offeror with the next best proposal. This process shall continue until the municipality reaches agreement on compensation with an offeror with an acceptable proposal. Once the municipality terminates negotiations with an offeror, the municipality cannot go back and renegotiate with that offeror.

(20) Noncompetitive Negotiation Procurement Method. Noncompetitive negotiation may be used only when the award of a subagreement is not feasible under small purchase, formal advertising, or competitive negotiation procedures. The municipality may award a noncompetitively negotiated subagreement only under the following circumstances:

(A) the item is available only from a single source;

(B) a public exigency or emergency exists and the urgency for the requirement will not permit a delay incident to competitive procurement; or

(C) after solicitation from a number of sources, competition is determined to be inadequate.

(21) Use of the Same Architect or Engineer During Construction.

(A) If the municipality is satisfied with the qualifications and performance of the architect or engineer who provided any or all of the planning or design services for the project, it may wish to retain that firm or individual during construction of the project. The municipality may do so without further public notice and evaluation of qualifications provided that it received financial assistance for the planning and/or design services and selected the architect or engineer in accordance with these procurement regulations.

(B) However, if the municipality uses the procedures in subparagraph (A) of this subdivision to retain an architect or engineer, any construction subagreements between the architect or engineer and the municipality shall meet the procurement provisions of subdivision (i) (5) of this section.

(22) Negotiation of Subagreements.

(A) Formal advertising, with adequate purchase descriptions, sealed bids, and public openings shall be the required method of procurement unless negotiation under subparagraph (B) of this subdivision is necessary to accomplish sound procurement.

(B) All negotiated procurement shall be conducted in a manner to provide to the maximum practicable extent open and free competition appropriate to the type of project work to be performed. The municipality is authorized to negotiate subagreements if any of the following conditions exist:

(i) public exigency will not permit the delay incident to formally advertised procurement (e.g. an emergency procurement); or

(ii) the aggregate amount involved does not exceed $10,000; or

(iii) the material or service to be procured is available from only one person or entity. If the procurement is expected to aggregate more than $10,000, the municipality shall document its file with a justification of the need for noncompetitive procurement, and provide such documentation to the Commissioner on request; or

(iv) the procurement is for personal or professional services (including architectural or engineering services) or for any service that a university or other educational institution may render; or

(v) no responsive, responsible bids at acceptable price levels have been received after formal advertising and the Commissioner's prior written approval has been obtained; or

(vi) the procurement is for materials or services where the price is established by law; or

(vii) the procurement is for technical items or equipment requiring standardization and interchangeability of parts with existing equipment; or

(viii) the procurement is for experimental, developmental or research services.

(23) Enforcement. If the Commissioner determines that the municipality has failed to comply with any of the provisions of this subsection, he or she may impose any of the following sanctions:

(A) the grant may be terminated or annulled under subsection (t) of this section; or

(B) project costs directly related to the noncompliance may be disallowed; or

(C) payment otherwise due to the municipality of up to 10 percent may be withheld; or

(D) project work may be suspended under subdivision (g) (6) of this section; or

(E) a noncomplying municipality may be found nonresponsible or ineligible for future state funding assistance or a noncomplying contractor may be found nonresponsible or ineligible for approval for future contract awards under state grants; or

(F) an injunction may be entered or other equitable relief afforded by a court of appropriate jurisdiction; or

(G) such other administrative or judicial action may be instituted if it is legally available and appropriate.

(24) Contract Enforcement and Commissioner Authority. At the request of a municipality, the Commissioner is authorized to provide technical and legal assistance in the administration and enforcement of any contract related to pollution abatement facilities for which a state grant was made and to intervene in any civil action involving the enforcement of such contracts, including contract disputes which are the subject of either arbitration or court action in accordance with the requirements of subdivision (f) (1) of this section.

(i) Architectural/Engineering Procurement Requirements.

(1) Type of Contract (Subagreement).

(A) General. Cost-plus-percentage-of-cost and percentage-of-construction-cost contracts are prohibited. Cost reimbursement, fixed price, or per diem contracts or combinations of these may be negotiated for architectural or engineering services. A fixed price contract is generally used only when the scope and extent of work to be performed is clearly defined.

In most other cases, a cost reimbursement type of contract is more appropriate. A per diem contract may be used if no other type of contract is appropriate. An incentive fee may be used if the municipality submits an adequate independent cost estimate and price comparison.

(B) Cost Reimbursement Contract. Each cost reimbursement contract shall clearly establish a cost ceiling which the engineer may not exceed without formally amending the contract and a fixed dollar profit which may not be increased except in the case of a contract amendment to increase the scope of work.

(C) Fixed Price Contract. An acceptable fixed price contract is one which establishes a guaranteed maximum price which may not be increased unless a contract amendment increases the scope of work.

(D) Compensation Procedures. If, under either a cost reimbursement or fixed price contract, the municipality desires to use a multiplier type of compensation, all of the following must apply:

(i) the multiplier and the portions of the multiplier allocable to overhead and allocable to profit have been specifically negotiated;

(ii) the portion of the multiplier allocable to overhead includes only allowable items of cost under the cost principles;

(iii) the portions of the multiplier allocable to profit and allocable to overhead have been separately identified in the contract; and

(iv) the fixed price contract includes a guaranteed maximum price for completion of the specifically defined scope of work; and the cost reimbursement contract includes a fixed dollar profit which may not be increased except in the case of a contract amendment which increases the scope of work.

(E) Per Diem Contracts. A per diem agreement may be utilized only after a determination that a fixed price or cost reimbursement type contract is not appropriate. Per diem agreements should be used only to a limited extent, e.g., where the first task under the planning agreement involves establishing the scope and cost of succeeding planning tasks or for incidental services such as expert testimony or intermittent professional or testing services. (Resident engineer and resident inspection services should generally be compensated at cost plus fixed fee). Cost and profit included in the per diem rate must be specifically negotiated and displayed separately in the engineer's proposal.

The contract must clearly establish a price ceiling which may not be exceeded without formally amending the contract.

(2) Public Notice. Adequate public notice must be given of the requirement for architectural or engineering services for all subagreements.

(A) Public Announcement. A notice of request for qualifications should be published in professional journals, newspapers, or publications of general circulation over a reasonable area and, in addition, if desired, through posted public notices or written notification directed to interested persons, firms, or professional organizations inviting the submission of statements of qualifications. The announcement must clearly state the deadline and place

for submission of qualification statements.

(B) Exceptions. Public notice is not required under the following circumstances:

(i) for design or construction phases of a grant funded project if the municipality is satisfied with the qualifications and performance of any engineer who performed all or any part of the planning or design work and the engineer has the capacity to perform the subsequent steps; and

(ii) the municipality desires the same engineer to provide architectural or engineering services for the subsequent steps or for subsequent segments of design work in one project, if a single pollution abatement facility is segmented into two or more construction projects. If the design work is accordingly segmented so that the initial contract for preparation of construction drawings and specifications does not cover the entire pollution abatement facility to be built under one grant then the municipality may use the same engineering firm that was selected for the initial segment of design work for subsequent segments.

(3) Evaluation of Qualifications.

(A) The municipality shall review the qualifications of firms which responded to the announcement or were on the prequalified list and shall uniformly evaluate the firms.

(B) Qualifications shall be evaluated through an objective process (e.g., the appointment of a board or committee which, to the extent practicable, should include persons with technical skills).

(C) Criteria which should be considered in the evaluation of candidates for submission of proposals should include:

(i) specialized experience and technical competence of the candidate or firm and its personnel (including a joint venture, association or professional subcontractor) considering the type of services required and the complexity of the project;

(ii) past record of performance on contracts with the municipality, other government agencies or public bodies, and with private industry, including such factors as control of costs, quality of work, and ability to meet schedules;

(iii) the candidate's capacity to perform the work (including any specialized services) within the time limitations, considering the firm's current and planned workload;

(iv) the candidate's familiarity with the types of problems applicable to the project; and

(v) avoidance of personal and organizational conflicts of interest.

(4) Solicitation and Evaluation of Proposals.

(A) Solicitation of Professional Services Proposals.

(i) Requests for professional services proposals shall be sent to no fewer than three candidates who either responded to the public announcement or were selected from the prequalified list, unless, after good faith effort to solicit qualifications, fewer than three qualified candidates respond, in which case all qualified candidates shall be provided requests for proposals.

(ii) Requests for professional services proposals shall be in writing and must contain the information necessary to enable a prospective offeror to prepare a proposal properly. The request for proposals shall include a solicitation statement and shall inform offerors of the

evaluation criteria.

(iii) Submission deadline. Requests for proposals shall clearly state the deadline and place for submission.

(B) Evaluation of Proposals.

(i) All proposals submitted in response to the request for professional services proposals shall be uniformly evaluated. The municipality shall also evaluate the candidates' proposed method of accomplishing the work required.

(ii) Proposals shall be evaluated through an objective process (e.g., the appointment of a board or committee) which, to the extent practicable, should include persons with technical skills. Oral (including telephone) or written interviews should be conducted with top rated proposers and information derived therefrom shall be treated on a confidential basis.

(iii) Municipalities shall base their determinations of qualified offerors and acceptable proposals solely on the evaluation criteria stated in the request for proposals.

(5) Negotiation.

(A) Municipalities are responsible for negotiation of their contracts for architectural or engineering services. Contract procurement, including negotiation, may be performed by the municipality directly or by another person or firm retained for that purpose. Contract negotiations may include the services of technical, legal, audit, or other specialists to the extent appropriate.

(B) Negotiations may be conducted in accordance with state or local requirements, as long as they meet the minimum requirements as set forth in this subdivision.

(C) The object of negotiations with any candidate shall be to reach agreement on the provisions of the proposed contract. The municipality and the candidate shall discuss, at a minimum:

(i) the scope and extent of work and other essential requirements;

(ii) identification of the personnel and facilities necessary to accomplish the work within the required time including, where needed, employment of additional personnel, subcontracting, joint venture, etc;

(iii) provisions of the required technical services in accordance with regulations and criteria established for the project; and

(iv) a fair and reasonable price for the required work, to be determined in accordance with the cost and profit considerations.

(6) Cost and Price Considerations.

(A) The candidate(s) selected for negotiation shall submit to the municipality for review sufficient cost and pricing data to enable the municipality to ascertain the necessity and reasonableness of costs and amounts proposed and the allowability and eligibility of costs proposed.

(B) The municipality shall submit the following to the Commissioner for review:

(i) documentation of the public notice of need for architectural or engineering services and selection procedures;

(ii) the cost and pricing data the selected engineer submitted;

(iii) a certification of review and acceptance of the selected engineer's cost and price; and

(iv) a copy of the proposed subagreement.

(C) The Commissioner shall review the complete subagreement procurement procedure and approve the municipality's compliance with appropriate procedures before the municipality awards the subagreement.

(D) Cost Review.

(i) The municipality shall review proposed subagreement costs.

(ii) At a minimum, proposed subagreement costs shall be presented on EPA form 5700-41 on which the selected engineer shall certify that the proposed costs reflect complete, current, and accurate cost and pricing data applicable to the date of anticipated subagreement award.

(iii) In addition to the specific elements of cost, the estimated amount of profit shall be set forth separately in the cost summary for fixed price contracts and a maximum total dollar amount of profit shall be set forth separately in the cost summary for cost reimbursement contracts.

(iv) The municipality may require more detailed cost data than the form requires in order to substantiate the reasonableness of proposed subagreement costs. The Commissioner may require more detailed documentation only when the selected engineer is unable to certify that the cost and pricing data used are complete, current, and accurate. The Commissioner may, on a selected basis, perform a pre-award cost analysis on any subagreement. A provisional overhead rate should be agreed upon before contract award.

(v) The engineer shall have an accounting system which accounts for costs in accordance with generally accepted accounting principles. This system shall provide for the identification, accumulation, and segregation of allowable and unallowable project costs among projects. Allowable project costs shall be determined by the Commissioner. The engineer shall propose and account for costs in a manner consistent with his normal accounting procedures.

(vi) Subagreements awarded on the basis of a review of a cost element summary and a certification of complete, current, and accurate cost and pricing data shall be subject to downward renegotiation or recoupment of funds where the Commissioner determines that such certification was not based on complete, current, and accurate cost and pricing data or was not based on allowable costs at the time of award.

(7) Profit. The objective of negotiations shall be the exercise of sound judgment and good administrative practice including the determination of a fair and reasonable profit based on the firm's assumption of risk and input to total performance and not merely the application of a predetermined percentage factor. For the purpose of subagreements under state grants, profit is defined as the net proceeds obtained by deducting all allowable costs (direct and indirect) from the price. (This definition of profit may vary from the firm's definition of profit for other purposes.) Profit on a subagreement and each amendment to a subagreement under a grant should be sufficient to attract engineers who possess the talent

and skills necessary for the accomplishment of project objectives and to stimulate efficient and expeditious completion of the project. Where cost review is performed, the municipality should review the estimate of profit as it reviews all other elements of price.

(8) Award of Subagreement.

(A) The municipality shall obtain the written approval of the Commissioner prior to the award of any subagreement or amendment.

(B) The municipality shall promptly notify unsuccessful candidates.

(9) Required Solicitation and Subagreement Provisions.

(A) Required solicitation statement. Requests for qualifications or proposals must include the following statement, as well as the proposed terms of the subagreement.

Any contract awarded under this request for qualifications or professional proposals is expected to be funded in part by the State of Connecticut, Department of Environmental Protection. This procurement will be subject to requirements contained in subsections (h), (i) and (o) of this section. The State of Connecticut will not be a party to this request for qualifications or professional proposals or any resulting contract.

(B) Content of subagreement. Each subagreement shall adequately define the scope and extent of project work; the time for performance and completion of the contract work including, where appropriate, dates for completion of significant project tasks; personnel and facilities necessary to accomplish the work within the required time; the extent of subcontracting and consultant agreements; and payment provisions. If any of these elements cannot be defined adequately for later tasks or steps at the time of contract execution, the contract should not include the subsequent tasks or steps at that time.

(10) Subagreement Payments. The municipality shall make payment to the engineer in accordance with the payment schedule incorporated in the engineering agreement. Any retainage is at the option of the municipality. No payment request made by the engineer under the agreement may exceed the estimated amount and value of the work and services performed.

(11) Subcontracts under Subagreements. Neither award and execution of subcontracts under a prime contract for architectural or engineering services nor the procurement and negotiation procedures used by the engineer in awarding such subcontracts are required to comply with any of the provisions, selection procedures, policies or principles set forth herein.

(j) **Construction Contract Procurement Requirements.** (This section applies to construction contracts in excess of $10,000 awarded by municipalities for any construction projects.)

(1) Type of Contract. Each contract shall be a fixed price (lump sum or unit price or a combination of the two) contract, unless the Commissioner gives advance written approval for the municipality to use some other acceptable type of contract. The cost-plus-percentage-of-cost contract shall not be used in any event.

(2) Formal Advertising. Each contract shall be awarded after formal advertising, unless negotitations are permitted in accordance with subdivision (18) of subsection (h) of this

section. Formal advertising shall be in accordance with the following:

(A) Adequate Public Notice. The municipality will cause adequate notice to be given of the solicitation by publication in newspapers or journals of general circulation beyond the municipality's locality (statewide, generally), inviting bids on the project work and stating the method by which bidding documents may be obtained or examined. Where the estimated cost of construction is 10 million dollars or more, the municipality shall publish the notice in trade journals of nationwide distribution. The municipality may solicit bids directly from bidders if it maintains a bidders list.

(B) Adequate Time for Preparing Bids. Adequate time, generally not less than 30 days, shall be allowed between the date when public notice is first published and the date by which bids must be submitted. Bidding documents including specifications and drawings shall be available to prospective bidders from the date when such notice is first published.

(C) Adequate Bidding Documents. The municipality shall prepare a reasonable number of bidding documents, invitations for bids and shall furnish them upon request on a first-come, first-serve basis. The municipality shall maintain a complete set of bidding documents and shall make them available for inspection and copying by any party. The bidding documents shall include:

(i) a complete statement of the work to be performed, including necessary drawings and specifications, and the required completion schedule;

(ii) the terms and conditions of the contract to be awarded;

(iii) a clear explanation of the method of bidding, the method of evaluation of bid prices, and the basis and method for award of the contract;

(iv) responsibility requirements or criteria which will be employed in evaluating bidders;

(v) the following statement:

Any contract or contracts awarded under this invitation for bids are expected to be funded in part by the State of Connecticut, Department of Environmental Protection. Neither the State of Connecticut nor any of its departments, agencies or employees is or will be a party to this invitation for bids or any resulting contract. This procurement will be subject to the requirements contained in subsections (h), (j) and (o) of this section;

(vi) a copy of subsections (h), (j) and (o) of this section; and

(vii) the prevailing State Wage Determination, as applicable.

(D) Sealed Bids. The municipality shall provide for bidding by sealed bid and for the safeguarding of bids received until public opening.

(E) Addenda to Bidding Documents. If a municipality desires to amend any part of the bidding documents (including drawings and specifications) during the period when bids are being prepared, the addenda shall be communicated in writing to all firms which have obtained bidding documents at least five (5) working days prior to the bid opening.

(F) Bid Modifications. A firm which has submitted a bid shall be allowed to modify or withdraw its bid before the time of bid opening.

(G) Public Opening of Bids. The municipality shall provide for a public opening of bids at the place, date and time announced in the bidding documents.

(H) Award to the Low, Responsive, Responsible Bidder.

(i) After bids are opened, the municipality shall evaluate them in accordance with the methods and criteria set forth in the bidding documents.

(ii) The municipality may reserve the right to reject all bids. Unless all bids are rejected for good cause, award shall be made to the low, responsive, responsible bidder.

(iii) If the municipality intends to make the award to a firm which did not submit the lowest bid, it shall prepare a written statement before any award, explaining why each lower bidder was deemed nonresponsible or nonresponsive. The municipality shall retain such statement in its files and forward a copy to the Commissioner for review.

(iv) Local laws, ordinances, regulations or procedures which are designed or which operate to give local bidders preference over other bidders shall not be employed in evaluating bids.

(v) If an unresolved procurement review issue or a protest relates only to award of a subcontract or procurement of an item under the prime contract and resolution of that issue or protest is unduly delaying performance of the prime contract, the Commissioner may authorize award and performance of the prime contract before resolution of the issue or protest, if the Commissioner determines that resolution of the protest will not affect the placement of the prime contract bidders and will not materially affect initial performance of the prime contract; and that award of the prime contract is in the state's best interest, will not materially affect the resolution of the protest, and is not barred by state or local law.

(vi) The municipality shall not reject a bid as nonresponsive for failure to list or otherwise indicate the selection of a subcontractor(s) or equipment, unless the municipality has unambiguously stated in the solicitation documents that such failure to list shall render a bid nonresponsive and shall cause rejection of a bid.

(k) **Negotiation of Contract Amendments (Change Orders).**

(1) The municipality is responsible for the negotiation of construction contract change orders. This function may be performed by the municipality directly or, if authorized, by its engineer. During negotiations with the contractor the municipality shall:

(A) make certain that the contractor has a clear understanding of the scope and extent of work and other essential requirements;

(B) assure that the contractor demonstrates that he will make available or will obtain the necessary personnel, equipment and materials to accomplish the work within the required time; and

(C) assure a fair and reasonable price for the required work.

(2) The contract price or time may be changed only by a change order. When negotiations are required, they shall be conducted in accordance with subdivisions (3) and (4) of this subsection as appropriate. The value of any work covered by a change order, or of any claim for increase or decrease in the contract price, shall be determined by the method set forth in subparagraphs (A) to (C) of this subdivision, whichever is most advantageous to the municipality.

(A) Unit prices.

(i) Original bid items. Unit prices previously approved are acceptable for pricing changes of original bid items. However, when changes in quantities exceed 15 percent of the original bid quantity and the total dollar change of that bid item is significant, the municipality shall review the unit price to determine if a new unit price should be negotiated.

(ii) New items. Unit prices of new items shall be negotiated.

(B) Lump Sums shall be negotiated.

(C) Cost reimbursement. The actual cost for labor, direct overhead, materials, supplies, equipment, and other services necessary to complete the work plus an amount to be agreed upon to cover the cost of general overhead and profit to be negotiated.

(3) For each change order not in excess of $100,000 the contractor shall submit sufficient cost and pricing data to the municipality to enable the municipality to determine the necessity and reasonableness of costs and amounts proposed, and the allowability and eligibility of costs proposed.

(4) For each change order in excess of $100,000, the contractor shall submit to the municipality for review sufficient cost and pricing data as described in subparagraphs (A) to (E) of this subdivision to enable the municipality to ascertain the necessity and reasonableness of costs and amounts proposed, and the allowability and eligibility of costs proposed.

(A) The contractor shall certify that proposed costs reflect complete, current, and accurate cost and pricing data applicable to the date of the change order.

(B) In addition to the specific elements of cost, the estimated amount of profit shall be set forth separately in the cost summary for fixed price change orders and a specific total dollar amount of profit will be set forth separately in the cost summary for cost reimbursement change orders.

(C) The municipality may require more detailed cost data in order to substantiate the reasonableness of proposed change order costs. The Commissioner may, on a selected basis, perform a detailed cost analysis on any change order.

(D) For costs under cost reimbursement change orders, the contractor shall have an accounting system which accounts for such costs in accordance with generally accepted accounting principles. This system shall provide for the identification, accumulation and segregation of allowable and unallowable change orders. Allowable change order costs shall be determined in accordance with subsections (a), (b), (c), (d) and (e) of this section. The contractor shall propose and account for such costs in a manner consistent with his normal accounting procedures.

(E) Change orders awarded on the basis of review of a cost element summary and a certification of complete, current, and accurate cost and pricing data shall be subject to downward renegotiation and recoupment of funds where a subsequent audit substantiates that such certification was not based on complete, current and accurate cost and pricing data.

(5) Review by Commissioner. The municipality shall submit, before the execution of any change order in excess of $100,000, to the Commissioner for review and approval:

(A) the cost and pricing data the contractor submitted;

(B) a certification of review and acceptance of the contractor's cost or price; and

(C) a copy of the proposed change order.

(6) Profit. The objective of negotiations shall be the exercise of sound business judgment and good administrative practice, including the determination of a fair and reasonable profit based on the contractor's assumption of risk and input to total performance, and not merely the application of a predetermined percentage factor. For the purpose of negotiated change orders to construction contracts profit is defined as the net proceeds obtained by deducting all allowable costs (direct and indirect) from the price. The municipality should review the estimate of profit as it reviews all other elements of price.

(7) Related Work. Related work shall not be split into two amendments or change orders merely to keep it under $100,000 and thereby avoid the requirements of subdivision (4) of this subsection. For change orders which include both additive and deductive items:

(A) if any single item (additive or deductive) exceeds $100,000 the requirements of subdivision (4) of this subsection shall be applicable;

(B) if no single additive or deductive item has a value of $100,000 but the total price of the change order is over $100,000, the requirements of subdivision (4) of this subsection shall be applicable; and

(C) if the total of additive items of work in the change order exceeds $100,000, or the total of deductive items of work in the change order exceeds $100,000, and the net price of the change order is less than $100,000, the requirements of subdivision (4) of this subsection shall be applicable.

(*l*) **Subcontracts under Construction Contracts.**

(1) The award or execution of subcontracts by a prime contractor under a construction contract awarded to the prime contractor by the municipality and the procurement and negotiation procedures used by prime contractors in awarding or executing subcontracts are not required to comply with any of the provisions, selection procedures, policies or principles set forth in subsection (h) or (j) of this section, except those specifically stated in this section. In addition, the bid protest procedures in subsection (o) of this section are not available to parties executing subcontracts with prime contractors, except as specifically provided in subsection (o) of this section.

(2) The award or execution of subcontracts by a prime contractor under a formally advertised, competitively bid, fixed price construction contract awarded to the prime contractor by the municipality, and the procurement and negotiation procedures used by such prime contractors in awarding or executing such subcontracts shall comply with any municipality procurement system, state, small, minority and women's business policy (section 22a-482-4 (h) (9)), negotiation of contract amendments (section 22a-482-4 (k)), and subdivisions (8) and (9) of section 22a-482-4 (g).

(m) **Progress Payments to Contractors.**

(1) Except as state law otherwise provides, municipalities shall make prompt progress payments to prime contractors and prime contractors should make prompt progress

payments to subcontractors and suppliers for eligible construction, material, and equipment costs, including those of undelivered, specifically manufactured equipment, incurred under a contract under this program. The Clean Water Fund shall only be obligated to pay the municipality amounts that the municipality is actually going to pay contractors.

(2) Conditions of Progress Payments. For purposes of this subsection, progress payments are defined as follows:

(A) payments for work in place; or

(B) payments for materials or equipment which have been delivered to the construction site, or which are stockpiled in the vicinity of the construction site, in accordance with the terms of the contract, when conditional or final acceptance is made by or for the municipality. The municipality shall assure that items for which progress payments have been made are adequately insured and are protected through appropriate security measures. Costs of such insurance and security are allowable costs; or

(C) payments for undelivered, specifically manufactured items or equipment (excluding off-the-shelf or catalog items) as work on them progresses. Such payments shall be made if provisions therefor are included in the bid and contract documents. Such provisions may be included at the option of the municipality only when all of the following conditions exist:

(i) the equipment is so designated in the project specifications;

(ii) the equipment to be specifically manufactured for the project could not be readily utilized on, nor diverted to, another job; and

(iii) a fabrication period of more than 6 months is anticipated.

(3) Protection of Progress Payments Made for Specifically Manufactured Equipment. The municipality shall assure protection of the state's interest in progress payments made for items or equipment referred to in subparagraph (2) (C) of this subsection. The protection shall be acceptable to the municipality and shall take the form of:

(A) securities negotiable without recourse, condition or restrictions, a progress payment bond, or an irrevocable letter of credit provided to the municipality through the prime contractor by the subcontractor or supplier; and

(B) for items or equipment in excess of $200,000 in value which are manufactured in a jurisdiction in which the Uniform Commercial Code is applicable, the creation and perfection of a security interest under the Uniform Commercial Code which is reasonably adequate to protect the interests of the municipality.

(4) Limitations on Progress Payments for Specifically Manufactured Equipment.

(A) Progress payments made for specifically manufactured equipment or items shall be limited to the following:

(i) a first payment upon submission by the prime contractor of shop drawings for the equipment or items in an amount not exceeding 15 percent of the contract or item price plus appropriate and allowable higher tier costs; and

(ii) subsequent to the municipality's release or approval for manufacture, additional payments not more frequently than monthly thereafter up to 75 percent of the contract or item price plus appropriate and allowable higher tier costs. However, payment may also be

made in accordance with the contract and grant terms and conditions for ancillary onsite work before delivery of the specifically manufactured equipment or items.

(B) In no case may progress payments for undelivered equipment or items under subparagraphs (A) (i) or (A) (ii) of this subdivision be made in an amount greater than 75 percent of the cumulative incurred costs allocable to contract performance with respect to the equipment or items. Submission of a request for any such progress payments shall be accompanied by a certification furnished by the fabricator of the equipment or item that the amount of progress payment claimed constitutes not more than 75 percent of cumulative incurred costs allocable to contract performance and, in addition, in the case of the first progress payment request, a certification that the amount claimed does not exceed 15 percent of the contract or item price quoted by the fabricator.

(C) As used in this subsection, the term "costs allocable to contract performance" with respect to undelivered equipment or items includes all expenses of contract performance which are reasonable, allocable to the contract, consistent with sound and generally accepted accounting principles and practices consistently applied and which are not excluded by the contract.

(5) Enforcement. A subcontractor or supplier which is determined by the Commissioner to have frustrated the intent of the provisions regarding progress payments for major equipment or specifically manufactured equipment through intentional forfeiture of its bond or failure to deliver the equipment may be determined nonresponsible and ineligible for further work under state funded projects.

(6) Contract Provisions. Where applicable, appropriate provisions regarding progress payments shall be included in each contract and subcontract.

(7) Implementation. The foregoing progress payments policy should be implemented in invitations for bids for projects funded by the Clean Water Fund. If provision for progress payments is made after contract award, it shall be for consideration that the municipality deems adequate.

(n) **Retention from Progress Payments.**

(1) The municipality may retain a portion of the amount otherwise due the contractor. The amount the municipality retains shall be limited to the following:

(A) withholding of not more than 5 percent of the payment claimed until work is 50 percent complete;

(B) when work is 50 percent complete, reduction of the withholding to 2 percent of the dollar value of all work satisfactorily completed to date, provided that the contractor is making satisfactory progress and there is no specific cause for greater withholding;

(C) when the work is substantially complete (operational or beneficial occupancy), the withheld amount shall be further reduced below 2 percent to only that amount necessary to assure completion;

(D) the municipality may reinstate up to 5 percent withholding if the municipality determines, at its discretion, that the contractor is not making satisfactory progress or there is other specific cause for such withholding; and

(E) the municipality may accept securities, negotiable without recourse, condition or restrictions, a release of retainage bond, or an irrevocable letter of credit provided by the contractor instead of all or part of the cash retainage.

(2) The requirements set out in subdivision (1) of this subsection shall be implemented with respect to all construction projects. Appropriate provision to assure compliance with these requirements shall be included in the bid documents for such projects initially or by addendum before the bid submission date and as a special condition in the funding agreement or in an amendment which is issued by the Commissioner.

(3) A municipality which delays disbursement to contractors of funds will be required to credit to the Clean Water Fund all interest earned on those funds and will be responsible for any and all tax law violations which occur as a result of their actions.

(o) **Protests.**

(1) General. A protest based upon an alleged violation of the procurement requirements may be filed against a municipality's procurement action by a party with an adversely affected direct financial interest. Any such protest must be received by the municipality within the time period in subparagraph (2) (A) of this subsection. The municipality is responsible for resolution of the protest before taking the protested action, in accordance with subdivision (4) of this subsection, except as otherwise provided by subdivision (9) of this subsection or subparagraph (j) (2) (H) (v).

(2) Time Limitations.

(A) A protest under subdivision (4) of this subsection should be made as early as possible during the procurement process to avoid disruption of, or unnecessary delay to, the procurement process. A protest authorized by subdivision (4) of this subsection shall be received by the municipality within one week after the basis for the protest is known or should have been known, whichever is earlier.

(i) In the case of an alleged violation of the specification requirements of subdivision (h) (12) of this section (e.g., that a product fails to qualify as an "or equal"), a protest need not be filed prior to the opening of bids. The municipality may resolve the issue before receipt of bids or proposals through a written or other formal determination, after notice and opportunity to comment is afforded to any party with a direct financial interest.

(ii) When an alleged violation of the specification requirements of subdivision (h) (12) of this section first arises subsequent to the receipt of bids or proposals, the municipality shall make a determination on the protest, if the protest was received by the municipality within one week of the time that the municipality's written or other formal notice is first received.

(B) A protest authorized under this subsection shall be filed in a court of competent jurisdiction within the locality of the municipality within one week after the complainant has received the municipality's determination.

(C) If a protest is mailed, the complaining party bears the risk of nondelivery within the required time period. All documents transmitted in accordance with this section shall be mailed (by certified mail return receipt requested) or otherwise delivered in a manner which

will objectively establish the date of receipt. Initiation of protest actions under subdivisions (4) or (5) of this subsection may be made by brief telegraphic notice accompanied by prompt mailing or other delivery of a more detailed statement of the basis for the protest. Telephone protests will not be considered.

(3) Other Initial Requirements.

(A) The initial protest document shall briefly state the basis for the protest and should:

(i) refer to the specific portions of sections 22a-482-1 to 22a-482-4 which allegedly prohibit the procurement action;

(ii) specifically request a determination pursuant to this section;

(iii) identify the specific procurement document(s) or portion(s) of them in issue; and

(iv) include the name, telephone number, and address of the person representing the protesting party.

(B) The party filing the protest shall concurrently transmit a copy of the initial protest document and any attached documentation to all other parties with a direct financial interest which may be adversely affected by the determination of the protest (all bidders or proposers who appear to have a substantial and reasonable prospect of receiving an award if the protest is denied or sustained) and to the Commissioner.

(4) Municipality Determination.

(A) The municipality is responsible for the initial resolution of protests based upon alleged violations of the procurement requirements.

(B) When the municipality receives a timely written protest, it must defer the protested procurement action in accordance with subdivision (7) of this subsection; and:

(i) afford the complaining party and interested parties an opportunity to present arguments in support of their views in writing or at a conference or other suitable meeting (such as a city council meeting);

(ii) inform the complainant and other interested parties of the procedures which the municipality will observe for resolution of the protest;

(iii) obtain an appropriate extension of the period for acceptance of the bid and bid bond(s) of each interested party, where applicable (failure to agree to a suitable extension of such bid and bid bond(s) by the party which initiated the protest shall be cause for summary dismissal of the protest by the municipality or the Commissioner); and

(iv) promptly deliver (by certified mail, return receipt requested, or by personal delivery) its written determination of the protest to the complaining party and to each other participating party.

(C) The municipality's determination shall be accompanied by a legal opinion addressing issues arising under state or local law, if any and, when construction is involved, by an engineering report, if appropriate.

(D) The municipality should decide the protest as promptly as possible, generally within 3 weeks after receipt of a protest, unless extenuating circumstances require a longer period of time for proper resolution of the protest.

(5) Procedures.

(A) Where resolution of an issue properly raised with respect to a procurement requirement necessitates prior or collateral resolution of a legal issue arising under state or local law and such law is not clearly established in published legal decisions of the state or other relevant jurisdiction, the municipality may rely upon:

(i) an opinion of the municipality's legal counsel adequately addressing the issue; or

(ii) the established or consistent practice of the municipality, to the extent appropriate; or

(iii) the law of other local jurisdictions as established in published legal decisions; or

(iv) if none of the foregoing adequately resolve the issue, published decisions of the Comptroller General of the United States (U.S. General Accounting Office) or of the federal or state courts addressing federal or state requirements comparable to procurement requirements of this section.

(B) A party who submits a document subsequent to initiation of a protest proceeding shall simultaneously furnish each of the other parties with a copy of such document.

(C) The procedures established herein are not intended to preclude informal resolution or voluntary withdrawal of protests. A complainant may withdraw its appeal at any time and the protest proceedings shall thereupon be terminated.

(D) A protest may be dismissed for failure to comply with procedural requirements set forth in this section.

(6) Burden of Proof.

(A) In protest proceedings, if the municipality proposes to award a formally advertised, competitively bid, fixed price contract to a party who has submitted the apparent lowest price, the party initiating the protest will bear the burden of proof.

(B) In protest proceedings:

(i) if the municipality proposes to award a formally advertised, competitively bid, fixed price contract to a bidder other than the bidder which submitted the apparent lowest price, the municipality shall bear the burden of proving that its determination concerning responsiveness is in accordance with Section 22a-482-1 to 22a-482-4; and

(ii) if the basis for the municipality's determination is a finding of nonresponsibility, the municipality shall establish and substantiate the basis for its determination and shall adequately establish that such determination has been made in good faith.

(7) Deferral of Procurement Action. Upon receipt of a protest, the municipality shall defer the protested procurement action (for example, defer the issuance of solicitations, contract award, or issuance of notice to proceed under a contract) until ten days after delivery of its determination to the participating parties. The municipality may receive or open bids at its own risk, if it considers this to be in its best interest. When the Commissioner has received a written protest, he or she shall notify the municipality promptly to defer its protested procurement action until notified of the formal or informal resolution of the protest.

(8) Enforcement. Noncompliance with the procurement provisions by the municipality shall be cause for enforcement action in accordance with one or more of the provisions of

subdivision (h) (23) of this section.

(9) Limitation. A protest may not be filed with respect to the following:

(A) issues not arising under the procurement provisions; or

(B) issues relating to the selection of a consulting engineer, provided that a protest may be filed only with respect to the mandatory procedural requirements of subsection (i) of this section; or

(C) issues primarily determined by local law or ordinance and as to which the Commissioner, upon review, determines that there is no contravening state requirement and that the municipality's action has a rational basis; or

(D) provisions of state regulations applicable to direct state contracts unless such provisions are explicitly referred to or incorporated in section 22a-482; or

(E) basic project design determinations; or

(F) award of subcontracts or issuance of purchase orders under formally advertised, competitively bid, lump sum construction contracts. However, protests may be made to alleged violations of the following:

(i) specification requirements of subdivision (h) (12) of this section; or

(ii) provisions applicable to the procurement procedures, negotiation or award of subcontracts or issuance of purchase orders under subsection (1) of this section.

(p) **Funding Assistance Conditions.** Financing for pollution abatement facilities shall be subject to the following conditions:

(1) Municipality Responsibilities.

(A) Review or approval of engineering reports, plans and specifications or other documents by the Commissioner is for administrative purposes only and does not relieve the municipality of its responsibility to properly plan, design, build and effectively operate and maintain the pollution abatement facilities described in the funding assistance agreement as required under law, regulations, permits, and good management practices. The Commissioner is not responsible for increased building costs resulting from defects in the plans, design drawings and specifications or other subagreement documents.

(B) By its acceptance of financing, the municipality agrees to complete the pollution abatement facilities in accordance with the engineering report, plans and specifications and related documents approved by the Commissioner and to maintain and operate the pollution abatement facilities to meet the enforceable requirements of the permit issued pursuant to section 22a-430 of the Connecticut General Statutes for the design life of the pollution abatement facilities. The Commissioner may seek specific enforcement or recovery of funds from the municipality, or take other appropriate action if he or she determines that the municipality has failed to make good faith efforts to meet its obligations under the grant/loan agreement.

(C) The municipality agrees to pay the non-state costs of the pollution abatement facilities construction associated with the project and commits itself to complete the construction of the operable pollution abatement facilities and the complete pollution abatement facilities of which the project is a part.

(2) Nondiscrimination. All contracts are subject to the Governor's Executive Order No. Three and to the guidelines and rules issued by the State Labor Commission to implement Executive Order No. Three.

(3) Wage Rates. Contracts involving construction work are subject to the appropriate state wage rates issued by the State Labor Commissioner and federal wage rates issued by the United States Department of Labor.

(4) Access. The municipality shall insure that the Commissioner and his or her duly authorized agents shall have access to the project work whenever it is in preparation or progress. The municipality shall provide proper facilities for access and inspection. The municipality shall allow any authorized agent of the state to have access to any books, documents, plans, reports, papers, and other records of the contractor which are pertinent to the project for the purpose of making audit, examination, excerpts, copies and transcriptions. The municipality shall insure that a party to a subagreement shall provide access to the project work, sites, documents, and records.

(5) Project Changes.

(A) Minor changes in the project work that are consistent with the objectives of the project and within the scope of the funding agreement do not require the execution of a formal amendment before the municipality's implementation of the change. However, if such changes increase the costs of the project, the amount of the funding provided by the funding agreement may only be increased by a formal amendment.

(B) The municipality shall receive from the Commissioner a formal amendment before implementing changes which:

(i) alter the project performance standards; or

(ii) alter the type of treatment facilities provided by the project; or

(iii) delay or accelerate the project schedule; or

(iv) substantially alter the engineering report, design drawings and specifications, or the location, size, capacity, or quality of any major part of the project.

(6) Operation and Maintenance.

(A) The municipality shall make provisions satisfactory to the Commissioner for assuring economical and effective operation and maintenance of the pollution abatement facilities in accordance with a plan of operation approved by the Commissioner.

(B) The Commissioner shall not pay more than 50 percent of the grant share of any project unless the municipality has an approved final plan of operation and shall not pay more than 90 percent of the grant share of any project unless the municipality has an approved operation and maintenance manual.

(7) Adoption of User Charge System and Sewer Use Ordinance.

The municipality shall adopt the sewer use ordinance and implement the user charge system developed under subsections (e) and (f) of 22a-482-3 and approved by the Commissioner before the pollution abatement facilities are placed in operation. Further, the municipality shall implement the user charge system and sewer use ordinance for the useful life of the pollution abatement facilities.

(8) Value Engineering.

The municipality shall comply with the applicable requirements of section 22a-482-3 (d) for value engineering.

(9) Project Initiation and Completion.

(A) The municipality shall expeditiously initiate and complete the project in accordance with the project schedule contained in the funding agreement.

(B) The municipality shall initiate procurement action for building the project promptly after the award of financing. The Commissioner may annul or terminate the funding agreement if the municipality has not awarded the subagreements and issued a notice to proceed, where one is required, for building all significant elements of the project within twelve (12) months of the closing. Failure to promptly award all subagreement(s) for building the project shall result in a limitation on allowable grant costs.

(10) Municipality Responsibility for Project Performance.

(A) The municipality shall select the engineer or engineering firm principally responsible for either supervising construction or providing architectural and engineering services during construction as the prime engineer to provide the following services during the first year following the initiation of operation:

(i) direct the operation of the project and revise the operation and maintenance manual for the project as necessary to accommodate actual operating experience;

(ii) train or provide for training of operating personnel, including the preparation of curricula and training material for operating personnel; and

(iii) advise the municipality whether the project is capable of meeting the project performance standards.

(B) On the date one year after the initiation of operation of the project the municipality shall certify to the Commissioner whether the project is capable of meeting the project performance standards. If the project does not meet the project performance standards, the municipality shall submit the following:

(i) a corrective action report which includes an analysis of the cause of the project's inability to meet the performance standards (including infiltration/inflow reduction) and estimates of the nature, scope and cost of the corrective action necessary to bring the project into compliance. Such corrective action report shall be prepared at other than state expense;

(ii) the schedule for undertaking, in a timely manner, the corrective action necessary to bring the project into compliance; and

(iii) the scheduled date for certifying to the Commissioner that the project is capable of meeting the project performance standards.

(C) Corrective action necessary to bring a project into compliance with the project performance standards shall be undertaken by the municipality at other than state expense.

(D) Nothing in this section shall be construed to prohibit a municipality from requiring more assurances, guarantees, or indemnity or other contractual requirements from any party performing project work.

(11) Final Inspection. The municipality shall notify the Commissioner of the completion

of project construction and the Commissioner shall cause final inspection to be made within 60 days of receipt of the notice. When final inspection is completed and the Commissioner determines that the treatment works have been satisfactorily constructed, in accordance with the funding assistance agreement, the municipality may make a request for final payment under subdivision (s) (5) of this section.

(q) **Financial Assistance Agreement Amendments.**

(1) Agreements may be amended for project changes in accordance with this subsection. No agreement may be amended to increase the amount of assistance unless the funds are available for obligation. A formal amendment shall be effected only by a written amendment to the agreement.

(2) For financial assistance awarded under Sections 22a-482-1 to 22a-482-4, an amendment to increase the amount may be made for:

(A) change orders, claims and arbitration settlements; or

(B) revised bid documents; or

(C) project changes required by the Commissioner; or

(D) increased costs on architectual/engineering agreements.

(r) **Enforcement.** If the Commissioner determines that the municipality has failed to comply with any provision of these regulations, he or she may impose any of the following:

(1) the grant portion of the financing may be withheld under subdivisions (t) (3) or (t) (4) of this section.

(2) grant project costs directly related to the noncompliance may be disallowed; or

(3) project work may be suspended; or

(4) a noncomplying municipality may be found nonresponsible or ineligible for future state assistance; or

(5) an injunction may be entered or other equitable relief afforded by a court of appropriate jurisdiction; or

(6) such other administrative or judicial action may be instituted as is legally available and appropriate.

(s) **Grant and Loan Payments.** The municipality shall be paid the allowable project costs incurred within the scope of an approved project and which are currently due and payable from the municipality (i.e. not including withheld or deferred amounts), up to the amount set forth in the agreement and any amendments thereto. Payments for engineering services shall be made in accordance with subsection (f) of this section and payments for construction contracts shall be made in accordance with subsections (m) and (n) of this section. All allowable costs incurred before initiation of construction of the project shall be claimed in the application for assistance for that project before the award of the assistance or no subsequent payment shall be made for the costs.

(1) Initial Request for Payment. Upon award of financial assistance, the municipality may request payment for the unpaid share of allowable project costs incurred before the award. Payment for such costs shall be made in accordance with the negotiated payment schedule included in the agreement.

(2) Interim Requests for Payment. The municipality may submit requests for payments for allowable costs in accordance with the negotiated payment schedule included in the agreement. Generally, payments shall be made within 13 days after receipt of a request for payment.

(3) Adjustment. At any time before final payment under the agreement, the Commissioner may cause any request(s) for payment to be reviewed or audited and make appropriate adjustment.

(4) Refunds, Rebates, Credits, etc. The state share of any refunds, rebates, credits or other amounts (including any interest) that accrue to or are received by the municipality for the project, and that are properly allocable to costs which the municipality has received funding assistance shall be credited to the current state allotment. Reasonable expenses incurred by the municipality for the purpose of securing such refunds, rebates, credits, or other amounts shall be allowable when approved by the Commissioner.

(5) Final Payment. After completion of final inspection under subdivision (p) (11) of this section, receipt and approval of the request for payment which the municipality designates as the "final payment request," and the municipality is deemed in compliance with all applicable requirements of the funding agreement, the Commissioner shall pay to the municipality any balance of the share of allowable project costs which has not already been paid. The municipality must submit the final payment request within six (6) months of the scheduled completion.

(6) Assignment and Release. By its acceptance of final payment, the municipality agrees to assign to the state the state share of refunds, rebates, credits or other amounts, including any interest, properly allocable to costs for which the municipality has been paid by the state under the assistance agreement. The municipality thereby also releases and discharges the state, its officers, agents and employees from all liabilities, obligations, and claims arising out of the project work subject only to exceptions previously specified in writing between the Commissioner and the municipality.

(7) Audit Upon Completion of the Project. The municipality shall certify to the state that the project has been completed in accordance with the final plans and specifications approved by the Commissioner. The municipality shall within 90 days of such certification, prepare an audit of the project performed by an independent public accountant meeting the requirements of section 7-394a and 7-396a of the Connecticut General Statutes. Such audit shall be performed in accordance with generally accepted accounting principles and shall identify any expenditures made by the municipality not in conformance with the agreement. The municipality further agrees that the auditors of Public Accounts of the state shall have access to all records and accounts of the municipality concerning the project. To provide such access the municipality agrees that it shall preserve all its records and accounts concerning the project for a period of 3 years after the date such audit is delivered to the state.

(t) **Administrative Changes.**

(1) Transfer of Agreements; Change of Name Agreements. Transfer of an agreement and

change of name agreements require the prior written approval of the Commissioner. The municipality may not approve any transfer of an agreement without the concurrence of the Commissioner. The Commissioner shall prepare the necessary transfer documents upon receipt of appropriate information and documents submitted by the municipality.

(2) Suspension of Work (Stop Work Orders). Work on a project or on a portion or phase of a project for which funding assistance has been awarded may be ordered stopped by the Commissioner.

(A) Use of Stop-Work Orders. Work stoppage may be required for good cause such as default by the municipality, failure to comply with the terms and conditions of the funding agreement, realignment of programs, lack of adequate funding, or advancements in the state of the art. Inasmuch as stop-work orders may result in increased costs to the state by reason of standby costs, such orders will be issued only after a review by the Commissioner. Generally, use of a stop-work order shall be limited to those situations where it is advisable to suspend work on the project or a portion or phase of the project for important program or agency considerations and a supplemental agreement providing for such suspension is not feasible. Although a stop-work order may be used pending a decision to terminate by mutual agreement or for other cause, it shall not be used in lieu of the issuance of a termination notice after a decision to terminate has been made.

(B) Contents of stop-work orders should be discussed with the municipality and should be appropriately modified in light of such discussions. Stop-work orders should include a clear description of the work to be suspended, instructions as to the issuance of further orders by the municipality for materials or services, guidance as to action to be taken on subagreements, and other suggestions to the municipality for minimizing costs.

(C) Issuance of Stop-Work Order. After appropriate review of the proposed action has occurred, the Commissioner may, by written order to the municipality, require the municipality to stop all or any part of the project work for a period of not more than forty-five (45) days after the order is delivered to the municipality, and for any further period to which the parties may agree. The Commissioner shall prepare the necessary documents for the stop-work order. Any such order shall be specifically identified as a stop-work order issued pursuant to this subdivision.

(D) Effect of Stop-Work Order.

(i) Upon receipt of a stop-work order, the municipality shall forthwith comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the work covered by the order during the period of work stoppage. Within the suspension period or within any extension of that period to which the parties shall have agreed, the state shall either cancel the stop-work order, in full or in part, terminate the work covered by such order as provided in subdivision (t) (3) of this section or authorize resumption of work.

(ii) If a stop-work order is cancelled or the period of the order or any extension thereof expires, the municipality shall promptly resume the previously suspended work. An equitable adjustment shall be made in the grant period, the project period, the grant amount, the funding assistance amount, or all of these, and the funding assistance instrument shall

be amended accordingly if the stop-work order results in an increase in the time required for, or an increase in the municipality's cost properly allocable to, the performance of any part of the project and the municipality asserts a written claim for such adjustment within sixty (60) days after the end of the period of work stoppage.

(iii) If a stop-work order is not cancelled and the grant-related project work covered by such order is within the scope of a subsequently-issued termination order, the reasonable cost resulting from the stop-work order shall be allowed in arriving at the termination settlement.

(iv) Costs incurred by the municipality, its contractors, subcontractors, or representatives, after a stop-work order is delivered, or within any extension of the stop-work period to which the parties shall have agreed, with respect to the project work suspended by such order or agreement which are not authorized by this section or specifically authorized in writing by the Commissioner, shall not be allowable costs.

(3) Termination of Funding Agreements. A funding agreement may be terminated in whole or in part by the Commissioner in circumstances where good cause can be demonstrated.

(A) Termination Agreement. The parties may enter into an agreement to terminate the funding agreement at any time pursuant to terms which are consistent with these regulations. The agreement shall establish the effective date of termination of the project, the basis for settlement of termination costs, the amount and date of payment of any sums due either party, and the schedule of repayment of all sums borrowed from the Clean Water Fund by the municipality. The Commissioner shall prepare the necessary termination documents.

(B) Project Termination by Municipality. A municipality may not unilaterally terminate the project work except for good cause. The municipality shall promptly give written notice to the Commissioner of any complete or partial termination of the project work by the municipality. If the Commissioner determines that there is good cause for the termination of all or any portion of a project, he or she may enter into a termination agreement or unilaterally terminate, effective with the date of cessation of the project work by the municipality. If the Commissioner determines that a municipality has ceased work on the project without good cause, he or she may unilaterally terminate or annual the agreement.

(C) Termination by Commissioner.

(i) Notice of Intent to Terminate. The Commissioner shall give not less than ten (10) days written notice to the municipality of intent to terminate a funding agreement in whole or in part.

(ii) Termination Action. The municipality shall be afforded an opportunity for consultation prior to any termination. After the Commissioner has been informed of any expressed views of the municipality and concurs in the proposed termination, the Commissioner may, in writing, terminate the agreement in whole or in part.

(iii) Basis for Termination. An agreement may be terminated by the Commissioner for good cause subject to negotiation and payment of appropriate termination settlement costs.

(D) Effect of Termination. Upon termination, the municipality shall refund or credit to

the state any funds paid or owed to the municipality and allocable to the terminated project work, except such portion thereof as may be required to meet commitments which had become firm prior to the effective date of termination and are otherwise allowable. The municipality shall not make any new commitment without state approval. The municipality shall reduce the amount of outstanding commitments insofar as possible and report to the Commissioner the uncommitted balance of funds awarded under the funding agreement.

(4) Annulment of Agreement.

The Commissioner may annul the funding agreement if he or she determines that there has been no substantial performance of the project work without good cause, there is convincing evidence the funding assistance was obtained by fraud, or there is convincing evidence of gross abuse or corrupt practices in the administration of the project. In addition to such remedies as may be available to the state under state or local law, all funds previously paid to the municipality shall be returned or credited to the state and no further payments shall be made to the municipality.

(5) Deviations. The Commissioner is authorized to approve deviations from requirements of Sections 22a-482-1 to 22a-482-4, when he or she determines that such deviations are essential to effect necessary actions or where special circumstances make such deviations in the best interest of the state.

(A) Request for Deviation. A request for a deviation shall be submitted in writing to the Commissioner as far in advance as the exigencies of the situation will permit. Each request for a deviation shall contain at a minimum:

(i) the name of the municipality, the project identification number, and the dollar value, if appropriate;

(ii) identification of the section of Sections 22a-482-1 to 22a-482-4 from which a deviation is sought;

(iii) an adequate description of the deviation and the circumstances in which it shall be used, including all appropriate justification for the deviation request; and

(iv) a statement as to whether the same or a similiar deviation has been requested previously and, if so, circumstances of the previous request.

(B) Approval of Deviation. Deviations may be approved only by the Commissioner. A copy of each such written approval shall be retained in the official state project file.

(Effective March 5, 1992)

U.S. Department of Labor
Wage and Hour Division

Davis-Bacon and Related Acts Weekly Certified Payroll Form

(For Contractor's Optional Use; See Instructions at www.dol.gov/whd/forms/wh347instr.htm)

Unless otherwise noted, the information requested is specific to the named project below.

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.

U.S. Wage and Hour Division

Rev. January 2025
OMB No.: 1235-0008
Expires: 01/31/2028

☐ SUBMISSION OF FINAL DBRA CERTIFIED PAYROLL FORM ☐ PRIME CONTRACTOR ☐ SUBCONTRACTOR

PROJECT NAME	PROJECT NO. or CONTRACT NO.	CERTIFIED PAYROLL NO.	PRIME CONTRACTOR'S/SUBCONTRACTOR'S BUSINESS NAME
PROJECT LOCATION	**WAGE DETERMINATION NO.**	**WEEK ENDING DATE**	**PRIME CONTRACTOR'S/SUBCONTRACTOR'S BUSINESS ADDRESS**

(1A)	(1B)	(1C)	(1D)	(1E)	(2)	(3)	(4)		(5)	(6A)	(6B)	(6C)	(7A)	(7B)	(8)				(9)
WORKER ENTRY NO.	WORKER LAST NAME	WORKER FIRST NAME	WORKER MIDDLE INITIAL	WORKER IDENTIFYING NO.	(J) JOURNEYWORKER (RA) REGISTERD APPRENTICE	LABOR CLASSIFICATION	ST = STRAIGHT TIME OT = OVERTIME	(TOP) DAYS OF WORK WEEK (BOTTOM) DATES HOURS WORKED EACH DAY	TOTAL HOURS WORKED FOR WEEK	HOURLY WAGE RATE PAID FOR ST AND OT	TOTAL FRINGE BENEFIT CREDIT	PAYMENT IN LIEU OF FRINGE BENEFITS	GROSS AMT EARNED	GROSS AMT EARNED FOR **ALL WORK**	DEDUCTIONS FOR **ALL WORK**				NET PAY TO WORKER FOR **ALL WORK**
															TAX WITH-HOLDINGS	FICA	OTHER (MUST SPECIFY, SEE INSTRUCTIONS)	TOTAL DEDUCTIONS	
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While use of Form WH-347 itself is optional, covered contractors and subcontractors performing work on Federal or federally assisted construction contracts are required by the DBRA regulations and the contract clauses to submit payroll information on a weekly basis. The Copeland Act (40 U.S.C. § 3145) requires contractors and subcontractors performing work on Federal or federally financed construction contracts to, on a weekly basis, "furnish a statement on the wages paid each employee during the prior week." U.S. Department of Labor (DOL) Regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors and subcontractors to submit weekly certified payrolls to the appropriate Federal agency if the agency is a party to the contract (or, if the agency is not such a party, to the applicant, sponsor, owner, or other entity, as the case may be, that maintains such records, for transmission to the Federal agency). Each certified payroll must be accompanied by a signed "Statement of Compliance" (e.g., page 2 of the WH-347 or another document with identical wording) indicating that the certified payrolls are accurate and complete, and that each laborer or mechanic has been paid not less than the required Davis-Bacon prevailing wage rate(s) (including any fringe benefits) for the work performed. DOL and contracting agencies receiving this information review the information to determine whether workers have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that it will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

PROJECT NAME	PROJECT NO. or CONTRACT NO.	PAYROLL NO.	PRIME CONTRACTOR'S/SUBCONTRACTOR'S BUSINESS NAME
PROJECT LOCATION		**WEEK ENDING DATE**	**CERTIFYING OFFICIAL's NAME AND TITLE**

I paid or supervised the payment of the laborers or mechanics working on the above project during the stated time period. I certify the following:

☐ The payroll information submitted with this statement is correct and complete for the above project during the above period, and the wage and fringe benefit rates paid to the workers, including credit taken for the reasonably anticipated costs of a bona fide fringe benefit plan, fund or program, are not less than the applicable wage and fringe benefits rates for the classification(s) of work actually performed, as specified in the wage determination(s) incorporated into the contract.

☐ All regular payrolls and all other basic records that the contractor is required to maintain for this payroll period are complete and accurate and will be made available upon request from the agency or the Department of Labor.

☐ The classifications reported for each laborer or mechanic are the classification(s) of work that each worker actually performed.

☐ Any workers paid as apprentices during the above period are duly registered in a bona fide apprenticeship program registered with the Office of Apprenticeship, Employment and Training Administration, United States Department of Labor ("OA"), or a State Apprenticeship Agency ("SAA") recognized by Department of Labor. I have verified the registered apprenticeship program information provided below as accurate and applicable to any apprentices identified on page 1 of this form.

APPRENTICESHIP PROGRAM NAME	REGISTERED		NAME OF LABOR CLASSIFICATION
	☐ OA	☐ SAA	
	☐ OA	☐ SAA	
	☐ OA	☐ SAA	

☐ Fringe benefits have been paid in cash and/or to bona fide fringe benefit plans, funds, or programs. Where the contractor is claiming an hourly credit for their contributions to or reasonably anticipated costs of a bona fide fringe benefit plan, fund, or program, provide plan information and the hourly credit claimed for each worker listed on the previous page of this form.

HOURLY CREDIT FOR FRINGE BENEFITS

If an amount is listed in (6B) on the first page of this certified payroll form, enter the hourly credit claimed under each plan name, type and number for each worker and check whether the plan is funded or unfunded.

NAME OF WORKER	FB NAME / FB TYPE / PLAN NO. / ☐ Funded ☐ Unfunded												TOTAL HOURLY CREDIT
	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	$
	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	$
	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	$
	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	$
	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	$
	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	$
	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	$
	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hourly Credit	$	Hrly Credit	$	$

☐ All workers on the project have been paid the full weekly wages earned, and no rebates or deductions have been or will be made either directly or indirectly, other than permissible deductions as defined in 29 CFR part 3.

ADDITIONAL REMARKS

SIGNATURE OF CERTIFYING OFFICIAL	DATE	TELEPHONE NUMBER	EMAIL ADDRESS
		(___) ___ -____	

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION (SEE SECTION 1001 OF TITLE 18 AND SECTION 3729 OF TITLE 31 OF THE UNITED STATES CODE), AS WELL AS DEBARMENT FROM FUTURE FEDERAL AND FEDERALLY-ASSISTED CONTRACTS. INFORMATION REPORTED IN CERTIFIED PAYROLLS MAY BE SUBJECT TO DISCLOSURE IN RESPONSE TO A FREEDOM OF INFORMATION ACT REQUEST.

DBRA Requirements for Contracts in Excess of $100,000 Under EPA Grants

Under the Davis-Bacon and Related Acts (DBRA), all contracts awarded under EPA assistance agreements (grants) in excess of $100,000 that involve the employment of mechanics or laborers require contractors and subcontractors to comply with the overtime provisions of the Contract Wage Hours and Safety Standards Act (CWHSSA) at 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations in 29 CFR Part 5 and 2 CFR 200 Appendix II(E). By accepting this contract, you agree to comply with the requirements of CWHSSA described below, in addition to the DBRA Requirements for Contractors Under EPA Grants.

These requirements do not apply to the purchases of supplies or materials or articles ordinarily available on the open market, or contracts for transportation or transmission of intelligence. For the purposes of this provision, the terms "laborers and mechanics" include watchpersons and guards.

(b) Contract Work Hours and Safety Standards Act (CWHSSA).

(1) Overtime requirements

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; Liability for Unpaid Wages; Liquidated Damages

In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchpersons and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of $31 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1).

(3) Withholding for Unpaid Wages and Liquidated Damages

(i) *Withholding process.*

The EPA, recipient, or subrecipient at any tier, and/or contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this paragraph (b) on this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or

assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

(ii) *Priority to withheld funds*

The Department has priority to funds withheld or to be withheld in accordance with paragraph (a)(2)(i) or (b)(3)(i) of this section, or both, over claims to those funds by:

(A) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(B) A contracting agency for its reprocurement costs;

(C) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(D) A contractor's assignee(s);

(E) A contractor's successor(s); or

(F) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

(4) Subcontracts

The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs (b)(1) through (5) of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (5). In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

(5) Anti-Retaliation

It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

(i) Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

(ii) Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

(iii) Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

(iv) Informing any other person about their rights under CWHSSA or this part

CONNECTICUT CLEAN WATER FUND PROJECT SIGN

8’ 0”

State of Connecticut

Ned Lamont, Governor

Department of Energy and Environmental Protection

Katie S. Dykes, Commissioner

Project NAME

Environmental Protection for The City of XXXXXX

$0000 Description XXXX
$0000 State & Federal Grant
$0000 State & Federal Loan

From the
Connecticut DEEP Clean Water Fund

4’ 0”

Color Scheme:
Lettering in black
Background in white
Banner in yellow
Logo as pictured

Provide adequate supports for sign as site conditions may require. Keep sign a proper distance above prevailing grade to permit public viewing.

Revised December 2022

Disadvantage Business Enterprise (DBE)

Subcontractor Verification Form

Prime Contractor Company Name: _____

Contract Name/Number: _____

Contract Bid Amount: $_____

Note to prime contractor: You are required to complete this form listing each DBE (MBE or WBE) subcontractor to be employed in work eligible for the Drinking Water State Revolving Fund within the table below. Please submit an original of this completed form, along with each subcontractor's current, valid DBE certificate, to the municipality within 14 days of bid opening.

Name of proposed subcontractor/vendor	Type (MBE or WBE)	Type of Product or Service * (see below)	Contact Name, Address, Phone # of Subcontractor or Vendor	Dollar amount of proposed subcontract	MBE % of Contract towards goal	WBE % of Contract towards goal
* Type of Product or Service:	1 - Construction		2 - Supplies	3 - Services	4 - Equipment	

The completion and submission of this form does not constitute a contractual agreement between the general contractor and the named subcontractor, but is solely for documenting proposed compliance with DBE participation under the Department of Public Health's (DPH) Drinking Water State Revolving Fund (DWSRF).

Prime Contractor Authorized Signature	Date

STATE OF CONNECTICUT

BY HIS EXCELLENCY

THOMAS J. MESKILL

GOVERNOR

EXECUTIVE ORDER NO. THREE

WHEREAS, sections 4-61d(b) and 4-114a of the 1969 supplement to the general statutes require nondiscrimination clauses in state contracts and subcontracts for construction on public buildings, other public works and goods and services, and

WHEREAS, section 4-61e(c) of the 1969 supplement to the general statutes requires the labor department to encourage and enforce compliance with this policy by both employers and labor unions, and to promote equal employment opportunities, and

WHEREAS, the government of this state recognizes the duty and desirability of its leadership in providing equal employment opportunity, by implementing these laws,

NOW, THEREFORE, I, THOMAS J. MESKILL, Governor of the State of Connecticut, acting by virtue of the authority vested in me under section twelve of article fourth of the constitution of the state, as supplemented by section 3-1 of the general statutes, do hereby ORDER and DIRECT, as follows, by this Executive Order:

I

The labor commissioner shall be responsible for the administration of this Order and shall adopt such regulations as he deems necessary and appropriate to achieve the purposes of this Order. Upon the promulgation of this Order, the commissioner of finance and control shall issue a directive forthwith to all state agencies, that henceforth all state contracts and subcontracts for construction on public buildings, other public works and goods and services shall contain a provision rendering such contract or subcontract subject to this Order, and that such contract or subcontract may be cancelled, terminated or suspended by the labor commissioner for violation of or noncompliance with this Order or state or federal laws concerning nondiscrimination, notwithstanding that the labor commissioner is not a party to such contract or subcontract.

II

Each contractor having a contract containing the provisions prescribed in section 4-114a of the1969 supplement to the general statutes, shall file, and shall cause each of his subcontractors to file, compliance reports with the contracting agency or the labor commissioner, as may be directed such reports shall be filed within such times and shall contain such information as to employment policies and statistics of the contractor and each subcontractor, and shall be in such form as the labor commissioner may prescribe. Bidders or prospective contractors or

subcontractors may be required to state whether they have participated in any previous contract subject to the provisions of this Order or any preceding similar Order, and in that event to submit on behalf of themselves and their proposed subcontractors compliance reports prior to or as an initial part of their bid or negotiation of a contract.

III

Whenever the contractor or subcontractor has a collective bargaining agreement or other contract or understanding with a labor organization or employment agency as defined in section 31-122 of the general statutes, the compliance report shall identify the said organization or agency and the contracting agency or the labor commissioner may require a compliance report to be filed with the contracting agency or the labor commissioner, as may be directed, by such organization or agency, signed by an authorized officer or agent of such organization or agency, with supporting information, to the effect that the signer's practices and policies, including but not limited to matters concerning personnel, training, apprenticeship, membership, grievance and representation, and upgrading, do not discriminate on grounds of race, color, re1igious creed, age, sex or national origin, or ancestry of any individual, and that the signer will either affirmatively cooperate in the implementation of the policy and provisions of this Order, or that it consents and agrees that recruitment, employment and the terms and conditions of employment under the proposed contract shall be in accordance with the purposes and provisions of the Order.

IV

The labor commissioner may by regulation exempt certain classes of contracts, subcontracts or purchase orders from the implementation of this Order, for standard commercial supplies or raw materials, for less than specified amounts of money or numbers of workers or for subcontractors below a specified tier. The labor commissioner may also provide by regulation for the exemption of facilities of a contractor which are in all respects separate and distinct from activities of the contractor related to the performance of the state contract, provided only that such exemption will not interfere with or impede the implementation of this Order, and provided further, that in the absence of such an exemption, all facilities shall be covered by the provisions of this Order.

V

Each contracting agency shall be primarily responsible for obtaining compliance with the regulations of the labor commissioner with respect to contracts entered into by such agency or its contractors. All contracting agencies shall comply with the regulations of the labor commissioner in discharging their primary responsibility for securing compliance with the provisions of contracts and otherwise with the terms of this Order and of the regulations of the labor commissioner issued pursuant to this Order. They are directed to cooperate with the labor commissioner and to furnish the labor commissioner such information and assistance as he may require in the performance of his functions under this Order. They are further directed to appoint or designate from among the personnel of each agency, compliance officers, whose duty shall be to seek compliance with the objectives of this Order by conference, conciliation, mediation, or persuasion.

VI

The labor commissioner may investigate the employment practices and procedures of any state contractor or subcontractor and the practices and policies of any labor organization or employment agency hereinabove described, relating to employment under the state contract, as concerns nondiscrimination by such organization or agency as hereinabove described, or the labor commissioner may initiate such investigation by the appropriate contract agency, to determine whether or not the contractual provisions hereinabove specified or statutes of the state respecting them have been violated. Such investigation shall be conducted in accordance with the procedures established by the labor commissioner and the investigating agency shall report to the labor commissioner any action taken or recommended.

VII

The labor commissioner shall receive and investigate or cause to be investigated complaints by employees or prospective employees of a state contractor or subcontractor or members or applicants for membership or apprenticeship or training in a labor organization or employment agency hereinabove described, which allege discrimination contrary to the contractual provisions specified hereinabove or state statutes requiring nondiscrimination in employment opportunity. If this investigation is conducted for the labor commissioner by a contracting agency, that agency shall report to the labor commissioner what action has been taken or is recommended with regard to such complaints

VIII

The labor commissioner shall use his best efforts, directly and through contracting agencies, other interested federal, state and local agencies, contractors and all other available instrumentalities, including the commission on human rights and opportunities, the executive committee on human rights and opportunities, and the apprenticeship council under its mandate to provide advice and counsel to the labor commissioner in providing equal employment opportunities to all apprentices and to provide training, employment and upgrading opportunities for disadvantaged workers, in accordance with section 31-51(d) of the l969 supplement to the general statutes, to cause any labor organization or any employment agency whose members are engaged in work under government contracts or referring workers or providing or supervising apprenticeship or training for or in the course of work under a state contract or subcontract to cooperate in the implementation of the purposes of this Order. The labor commissioner shall in appropriate cases notify the commission on human rights and opportunities or other appropriate state or federal agencies whenever it has reason to believe that the practices of any such organization or agency violate equal employment opportunity requirements of state or federal law.

IX

The labor commissioner or any agency officer or employee in the executive branch designated by regulation of the labor commissioner may hold such hearings, public of private, as the labor commissioner may deem advisable for compliance, enforcement or educational purposes under this Order.

X

(a) The labor commissioner may hold or cause to be held hearings, prior to imposing ordering or recommending the imposition of penalties and sanctions under this Order. No order for disbarment of any contractor from further state contracts shall be made without affording the contractor an opportunity for a hearing. In accordance with such regulations as the labor commissioner may adopt, the commissioner or the appropriate contracting agency may

(1) Publish or cause to be published the names of contractors or labor organizations or employment agencies as hereinabove described which it has concluded have complied or failed to comply with the provisions of this Order or the regulations of the labor commissioner in implementing this Order.

(2) Recommend to the commission on human rights and opportunities that in cases in which there is substantial or material violation or threat thereof of the contractual provision or related state statutes concerned herein, appropriate proceedings be brought to enforce them, including proceedings by the commission on its own motion under chapter 563 of the general statutes and the enjoining, within the limitations of applicable law, of organizations, individuals or groups who prevent directly or indirectly or seek to prevent directly or indirectly compliance with the provisions of this Order.

(3) Recommend that criminal proceedings be brought under chapter 939 of the general statutes.

(4) Cancel, terminate, suspend or cause to be cancelled, terminated, or suspended in accordance with law any contract or any portion or portions thereof for failure of the contractor or subcontractor to comply with the nondiscrimination provisions of the contract. Contracts may be cancelled, terminated, suspended absolutely or their continuance conditioned upon a program for fixture compliance approved by the contracting agency.

(5) Provide that any contracting agency shall refrain from entering into any further contracts or extensions or modifications of existing contracts with any contractor until he has satisfied the labor commissioner that he has established and will carry out personnel and employment policies compliant with this Order.

(6) Under regulations prescribed by the labor commissioner each contracting agency shall make reasonable efforts within a reasonable period of time to secure compliance with the contract provisions of this Order by methods of conference conciliation, mediation or persuasion, before other proceedings shall be instituted under this Order or before a state contract shall be cancelled or terminated in whole or in part for failure of the contractor or subcontractor to comply with the contract provisions of state statute and this Order.

(b) Any contracting agency taking any action authorized by this Order, whether on its own motion or as directed by the labor commissioner or pursuant to his regulations shall promptly

notify *him* of such action. Whenever the labor commissioner makes a determination under this Order, he shall promptly notify the appropriate contracting agency and other interested federal, state and local agencies of the action recommended. The state and local agency or agencies shall take such action and shall report the results thereof to the labor commissioner within such time as he shall specify.

XI

If the labor commissioner shall so direct, contracting agencies shall not enter into contracts with any bidder or prospective contractor unless he has satisfactorily complied with the provisions of this Order, or submits a program, for compliance acceptable to the labor commissioner, or if the labor commissioner so authorizes, to the contracting agency.

XII

Whenever a contracting agency cancels or terminates a contract, or a contractor has been disbarred from, further government contracts because of noncompliance with the contract provisions with regard to nondiscrimination, the labor commissioner or the contracting agency shall rescind such disbarment, upon the satisfaction of the labor commissioner that the contractor has purged himself of such noncompliance and will thenceforth carry out personnel and employment policies of nondiscrimination in compliance with the provision of this order.

XIII

The labor commissioner may delegate to any officer, agency or employee in the executive branch any function or duty of the labor commissioner under this Order except authority to promulgate regulations of a general nature.

XIV

This Executive Order supplements the Executive Order issued on September 28, 1967. All regulations, orders, instructions, designations and other directives issued heretofore in these premises, including those issued by the heads of various departments or agencies under or pursuant to prior order or statute, shall remain in full force and effect, unless and until revoked or superceded by appropriate authority, to the extent that they are not inconsistent with this Order.

This Order shall become effective thirty days after the date of this Order.

Dated at Hartford, Connecticut, this 16th day of June, 1971.

Thomas J. Meskill, GOVERNOR

Filed this ____ day of June, 1971.

State Of Connecticut

By His Excellency

Thomas J. Meskill

Governor

Executive Order No. Seventeen

WHEREAS, Section 31-237 of the General Statutes of Connecticut as amended requires the maintaining of the established free services of the Connecticut State Employment Service to both employers and prospective employees and

WHEREAS, Section 31-5 of the General Statutes of Connecticut requires that no compensation or fee shall be charged or received directly or indirectly for the services of the Connecticut State Employment Service and

WHEREAS, large numbers of our citizens who have served in the Armed Forces of our nation are returning to civilian life in our state and seeking employment in civilian occupations and

WHEREAS, we owe a duty as well as gratitude to these returning veterans including the duty to find suitable employment for them and

WHEREAS, many of our handicapped citizens are fully capable of employment and are entitled to be placed in suitable employment and

WHEREAS, many of the citizens of our state who are unemployed are unaware of the job openings and employment opportunities which do in fact exist in our state and

WHEREAS, notwithstanding the free services of the Connecticut State Employment Service, many of our Connecticut employers do not use its free services or do not avail themselves fully of all the services offered,

NOW, THEREFORE, I, THOMAS J. MESKILL, Governor of the State of Connecticut, acting by virtue of the authority vested in me under the fourth article of the Constitution of the State and in accordance with Section 3-1 of the General Statutes, do hereby ORDER and direct, as follows, by this Executive Order:

I. The Labor Commissioner shall be responsible for the administration of this Order and shall do all acts necessary and appropriate to achieve its purpose. Upon promulgation of this Order, the Commissioner of Finance and Control shall issue a directive forthwith to all state agencies, that henceforth all state contracts and subcontracts for construction on public buildings, other public works and goods and services shall contain a provision rendering such contract or subcontract subject to this Order, and that such contract or subcontract may be cancelled, terminated or suspended by the Labor Commissioner for violation of or noncompliance with this Order, notwithstanding that the Labor Commissioner is not a party to such contract or subcontract.

II. Every contractor and subcontractor having a contract with the state or any of its agencies, boards, commissions, or departments, every individual partnership, corporation, or business entity having business with the state or who or which seeks to do business with the state, and every bidder or

prospective bidder who submits a bid or replies to an invitation to bid on any state contract shall list all employment openings with the office of the Connecticut State Employment Service in the area where the work is to be performed or where the services are to be rendered.

III. All state contracts shall contain a clause which shall be a condition of the contract that the contractor and any subcontractor holding a contract directly under the contractor shall list al employment openings with the Connecticut State Employment Service. The Labor Commissioner may allow exceptions to listings of employment openings which the contractor proposes to fill from within its organization from employees on the rolls of the contractor on the date of publication of the invitation to bid or the date on which the public announcement was published or promulgated advising of the program concerned.

IV. Each contracting agency of the state shall be primarily responsible for obtaining compliance with this Executive Order. Each contracting agency shall appoint or designate from among its personnel one or more persons who shall be responsible for compliance with the objectives of this Order.

V. The Labor Commissioner shall be and is hereby empowered to inspect the books, records, payroll and personnel data of each individual or business entity subject to this Executive Order and may hold hearings or conferences, formal or informal, in pursuance of the duties and responsibilities hereunto delegated to the Labor Commissioner.

VI. The Labor Commissioner or any agency officer or employee in the executive branch designated by regulation of the Labor Commissioner may hold such hearings, public or private, as the Labor Commissioner may deem advisable for compliance, enforcement or educational purposes under this Order.

VII. (a) The Labor Commissioner may hold or cause to be held hearings, prior to imposing, ordering, or recommending the imposition of penalties and sanctions under this Order. In accordance herewith, the Commissioner or the appropriate contracting agency may suspend, cancel, terminate, or cause to be suspended, cancelled, or terminated in accordance with law any contract or portion or portions thereof for failure of the contractor or subcontractor to comply with the listing provisions of the contract. Contracts may be cancelled, terminated, suspended absolutely or their continuance conditioned upon a program for future compliance approved by the contracting agency.

(b) Any contracting agency taking any action authorized by this Order, whether on its own motion or as directed by the Labor Commissioner, shall promptly notify him of such action. Whenever the Labor Commissioner makes a determination under this Order, he shall promptly notify the appropriate contracting agency of the action recommended. The agency shall report the results to the Labor Commissioner promptly.

VIII. If the Labor Commissioner shall so direct, contracting agencies shall not enter into contracts with any bidder or prospective contractor unless he has satisfactorily complied with the provisions of this Order.

This Order shall become effective sixty days after the date of this Order.

Dated at Hartford, Connecticut, this 15th day of February 1973.

Thomas J. Meskill
Governor

Filed this 15th day of February 1973.

Harry Hammer
Secretary Of The State (Deputy)

Department of Revenue Services
PO Box 5030
Hartford CT 06102-5030
(Rev. 02/22)
OS114 0819W 01 9999

Form OS-114
Connecticut Sales and Use Tax Return

See **Form O-88**, *Instructions for Form OS-114 Connecticut Sales and Use Tax Return.*

For period ending – – (MMDDYYYY) • Due date – – (MMDDYYYY)

Connecticut Tax Registration Number

Taxpayer Name
• This return MUST be filed electronically!

Federal Employer Identification Number •

Address (number and street), apartment number, PO Box
• DO NOT MAIL paper tax return to DRS.

Check here if:
Change of address:
Amended return:
Final return:
Enter last business date: (MMDDYYYY) – –

City, town, or post office • State • ZIP code •

Rounding: You must round off cents to the nearest whole dollar on your return and schedules.

	Column 1 General Sales 6.35% Tax Rate	Column 2 Meals and Beverages (Effective 10/1/19. See instructions.) 7.35% Tax Rate	Column 3 Luxury 7.75% Tax Rate	Column 4 Rental of Passenger Motor Vehicles 9.35% Tax Rate
1. Gross receipts from sales of goods ..... 1.	.00	.00	.00	
2. Gross receipts from leases and rentals..... 2.	.00		.00	.00
3. Gross receipts from labor and services ..... 3.	.00			
4. Goods purchased by your business subject to use tax ..... 4.	.00	.00	.00	
5. Leases and rentals by your business subject to use tax ..... 5.	.00		.00	.00
6. Services purchased by your business subject to use tax ..... 6.	.00			
7. Total: Add Lines 1 through 6. ..... 7.	.00	.00	.00	.00
8. Deductions. See instructions. ..... 8.	.00	.00	.00	.00
9. Subtract Line 8 from Line 7. If zero or less, enter "0". ..... 9.	.00	.00	.00	.00
10a. Amount of tax due: Multiply Line 9 by Tax Rate. .....10a.	.00	.00	.00	.00

10. Total tax due: Add Line 10a, Columns 1, 2, 3, and 4. ..... 10. .00

11. Credits for any advance payment of tax for this period. See instructions. ..... 11. .00

12. Net amount due: Subtract Line 11 from Line 10. ..... 12. .00

13. Interest + Penalty = • 13. .00

14. **Total amount due: Add Line 12 and Line 13.** ..... 14. .00

Declaration: I declare under the penalty of law that I have examined this return (including any accompanying schedules and statements) and, to the best of my knowledge and belief, it is true, complete, and correct. I understand the penalty for willfully delivering a false return or document to the Department of Revenue Services (DRS) is a fine of not more than $5,000, imprisonment for not more than five years, or both. The declaration of a paid preparer other than the taxpayer is based on all information of which the preparer has any knowledge.

Sign Here

Keep a copy of this return for your records.

Taxpayer's signature • Title • Date • (MMDDYYYY) Telephone number •

Taxpayer's email
This return MUST be filed electronically!

Paid preparer's signature
• DO NOT MAIL paper

Paid preparer's address
• tax return to DRS.

Date • (MMDDYYYY)

Visit us at **portal.ct.gov/DRS** for more information.

See instructions (**Form O-88**) before completing.

Connecticut Tax Registration Number •

File and pay Form OS-114 electronically. Visit **portal.ct.gov/DRS-myconneCT** to file your return electronically using **myconneCT**. Form OS-114 **must** be filed and paid on or before the last day of the month following the end of the period.

If applicable, provide the following information:

Enter new mailing address: •

Enter new physical location (PO Box is not acceptable.): •

Enter new trade name: • First return - Enter business start date: • – – (M M - D D - Y Y Y Y)

New owners must obtain a new Connecticut Tax Registration Number.

Enter new owner name: • Date sold: • – – (M M - D D - Y Y Y Y)

Address: •

Deductions (See instructions, Form O-88.)		Column 1 General Sales 6.35% Tax Rate	Column 2 Meals and Beverages (Effective 10/1/19. See instructions.) 7.35% Tax Rate	Column 3 Luxury 7.75% Tax Rate
15. Sales for resale or sales through a registered marketplace facilitator - sales of goods	15.	.00	.00	.00
16. Sales for resale or sales through a registered marketplace facilitator - leases and rentals	16.	.00		.00
17. Sales for resale or sales through a registered marketplace facilitator - labor and services	17.	.00		
18. All newspapers and subscription sales of magazines and puzzle magazines	18.	.00		
19. Trucks with GVW rating over 26,000 lbs. or used exclusively for carriage of interstate freight	19.	.00		
21. Food for human consumption, food sold in vending machines, items purchased with food stamps	21.	.00	.00	
23. Sale of fuel for motor vehicles	23.	.00		
24. Sales of electricity, gas, and heating fuel for residential dwellings (For Utility and Heating Fuel Companies Only)	24.	.00		
25. Sales of electricity - $150 monthly charge per business	25.	.00		
26. Sales of electricity, gas, and heating fuel for manufacturing or agricultural production	26.	.00		
27. Aviation fuel	27.	.00		
29. Tangible personal property to persons issued a Farmer Tax Exemption Permit	29.	.00		
30. Machinery, its replacement, repair, component and enhancement parts, materials, tools and fuel for manufacturing	30.	.00		
31. Machinery, materials, tools, and equipment used in commercial printing process or publishing	31.	.00		
32. Vessels, machinery, materials, tools, and fuel for commercial fishing	32.	.00		

See instructions (**Form O-88**) before completing.

Connecticut Tax Registration Number •

		Column 1 General Sales 6.35% Tax Rate	Column 2 Meals and Beverages (Effective 10/1/19. See instructions.) 7.35% Tax Rate	Column 3 Luxury 7.75% Tax Rate
33. Out-of-state - sales of goods	33.	.00	.00	.00
34. Out-of-state - leases and rentals	34.	.00		.00
35. Out-of-state - labor and services	35.	.00		
36. Motor vehicles purchased by nonresidents	36.	.00		.00
37. Prescription medicines and diabetic equipment	37.	.00		
38. Nonprescription drugs and medicines	38.	.00		
39. Sales to charitable or religious organizations - sales of goods	39.	.00	.00	.00
40. Sales to charitable or religious organizations - leases and rentals	40.	.00		.00
41. Sales to charitable or religious organizations - labor and services	41.	.00		
42. Sales to federal, Connecticut, or municipal agencies - sales of goods	42.	.00	.00	.00
43. Sales to federal, Connecticut, or municipal agencies - leases and rentals	43.	.00		.00
44. Sales to federal, Connecticut, or municipal agencies - labor and services	44.	.00		
45. Items certified for air or water pollution abatement - sales, leases, and rentals of goods	45.	.00		
47. Nontaxable labor and services	47.	.00		
48. Services between wholly-owned business entities (See instructions, Form O-88.)	48.	.00		
50. Trade-ins of all like-kind tangible personal property	50.	.00		.00
52. Taxed goods returned within 90 days at the rate listed above in Columns 1 or 3	52.	.00		.00
56. Oxygen, blood plasma, prostheses, etc. - sales, leases, rentals, or repair services of goods	56.	.00		
63. Funeral expenses	63.	.00		
69. Certain aircraft and repair services, repair or replacement parts for aircraft	69.	.00		
71. Certain machinery under the Manufacturing Recovery Act of 1992 (See instructions, Form O-88.)	71.	.00		
72. Machinery, equipment, tools, supplies, and fuel used in the biotechnology industry	72.	.00		
73. Repair and maintenance services and fabrication labor to vessels	73.	.00		

See instructions (**Form O-88**) before completing.

Connecticut Tax Registration Number •

	Column 1 General Sales 6.35% Tax Rate	Column 2 Meals and Beverages (Effective 10/1/19. See instructions.) 7.35% Tax Rate	Column 3 Luxury 7.75% Tax Rate
74. Computer and data processing services at 1% (See instructions, Form O-88.) ..... 74.	.00		
75. Renovation and repair services to residential real property ..... 75.	.00		
77. Sales of qualifying items to direct payment permit holders ..... 77.	.00		.00
78. Sales of college textbooks ..... 78.	.00		
79. Sales tax holiday ..... 79.	.00		
82. Motor vehicles sold to active duty nonresident members of the armed forces at 4.5% (See instructions, Form O-88.) ..... 82.	.00		.00
83. For cigarette dealers **only**: Purchases of cigarettes taxed by a stamper or distributor. ..... 83.	.00		
84. Sales of vessels, motors for vessels or trailers used for transporting vessels at 2.99%. Effective October 1, 2019, sales of dyed diesel marine fuel at 2.99%. (See instructions, Form O-88.) 84.	.00		
A. Other Adjustments - sales of goods ..... A.	.00	.00	.00
(Describe: •)			
B. Other Adjustments - leases and rentals ..... B.	.00		.00
(Describe: •)			
C. Other Adjustments - labor and services ..... C.	.00		
(Describe: •)			

Total Deductions:

Enter here and in Column 1, Line 8 on the front of this return. ..... •	.00		
Enter here and in Column 2, Line 8 on the front of this return. ..... •		.00	
Enter here and in Column 3, Line 8 on the front of this return. ..... •			.00

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Memorandum

To: All Connecticut Municipalities, Water Pollution Control Facilities, and Consultants

Date: May 28, 2015

Re: Revised American Iron and Steel Memorandum

The Department of Energy and Environmental Protection's (DEEP) Municipal Water Pollution Control Section has updated the American Iron and Steel (AIS) memorandum that was distributed on May 19, 2014.

On June 10, 2014, the Water Resources Reform and Development Act of 2014 (WRRDA) was signed into law by President Obama, which amended the Federal Water Pollution Control Act (FWPCA). The FWPCA section 608 extended the AIS provision that was originally scheduled to expire on September 30, 2014.

This means that AIS is now a **permanent** project requirement for all Connecticut Clean Water Fund (CWF) projects.

The effective date for the newly codified AIS provision is the date of enactment of the WRRDA, or June 10, 2014.

A recent Environmental Protection Agency (EPA) memorandum dated September 18, 2014 indicates that EPA intends to interpret the WRRDA language for the AIS requirement in the same manner as described in an earlier EPA guidance memo dated March 20, 2014. Therefore, the March 20, 2014 EPA memorandum shall still serve as the final EPA AIS guidance on how to apply the AIS requirement, and it is attached to the revised CWF memo.

The final memorandum is now available on our website at http://www.ct.gov/dep/cwp.

Sincerely,

George V. Hicks, P.E.
Supervising Sanitary Engineer
Bureau of Water Protection & Land Reuse

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Revised Clean Water Fund Memorandum (2014-001a)

TO: All Connecticut Municipalities and Consultants

RE: Implementation of American Iron and Steel provisions on Connecticut Clean Water Fund Projects

I. PURPOSE

To provide clarification on the applicability of American Iron and Steel (AIS) provisions to construction projects funded by the Connecticut Clean Water Fund (CWF).

II. GOVERNING FEDERAL PUBLIC LAW

Section 436 of Public Law (P.L.) 113-76, Consolidated Appropriations Act, 2014.

III. APPLICABILITY

All Connecticut CWF projects must use "iron and steel products" (Section III.A) that are "produced in the United States" for construction projects. The final Environmental Protection Agency (EPA) AIS guidance memorandum dated March 20, 2014 ("final EPA AIS guidance") on how to apply the AIS requirement is attached.

This memorandum summarizes the final EPA AIS guidance, and describes how it relates specifically to Connecticut CWF projects. Section III.C details what is required for a CWF project that is subject to the AIS provisions. Any definitions provided by the final EPA AIS guidance are included in Section IV.

Section 436 of P.L. 113-76 excludes products (Section III.B) to the AIS requirement, as well as a waiver request process to exclude products or the entire project from AIS requirements (Section III.D).

A. Applicable Iron and Steel Products

1. The AIS requirement applies to all of the following products:
   a. Lined or unlined pipes and fittings;
   b. Manholes covers and other "municipal castings";
   c. Hydrants;
   d. Tanks;
   e. Flanges;
   f. Pipe clamps and restraints;
   g. Valves;
   h. "Structural steel";
   i. Reinforced precast concrete; or
   j. "Construction materials".

   Refer to Section IV for further clarification of items b, h, and j.

2. Each project item listed in Section III.A.1 and is considered to be "primarily iron or steel", or comprised of greater than 50% iron or "steel" as measured by cost, becomes subject to the AIS requirement.
   a. The cost used to determine AIS applicability shall be based on the material costs, and shall include the cost to pour and cast iron and/or steel components.
   b. The cost used to determine AIS applicability shall not include assembly cost.

3. Unlike the products listed in Section III.A.1.a – h and j, all reinforced precast concrete used in applicable products is subject to the AIS requirement, no matter how much iron or steel comprises the reinforced precast concrete. The reinforcing bar and wire must be produced in the US and meet the same standards as for any other iron or steel product. The casting of the concrete product must take place in the US. The cement and other raw materials used in concrete production are not required to be of domestic origin.

4. "Construction materials" are any products that become permanently incorporated into the project, even if those products may be considered temporary in most instances. For example, any iron or steel sheeting or piles that are not removed after construction is completed are considered to be "construction materials" subject to the AIS requirement.

B. Excluded Products

1. The AIS requirement does <u>not</u> apply to any mechanical and/or electrical components, equipment and systems. Mechanical and electrical components, equipment and systems are not considered construction materials.

2. The following examples (including their appurtenances necessary for their intended use and operation) are NOT considered construction materials, and are therefore NOT subject to the AIS requirement:
   a. Pumps;
   b. Motors;
   c. Gear reducers;
   d. Drives (including variable frequency drives (VFDs));
   e. Electric/pneumatic/manual accessories used to operate valves (such as electric valve actuators);
   f. Mixers;
   g. Gates;
   h. Motorized screens (such as traveling screens);
   i. Blowers/aeration equipment;
   j. Compressors;
   k. Meters, sensors, controls and switches;
   l. Supervisory control and data acquisition (SCADA);
   m. Membrane bioreactor systems;
   n. Membrane filtration systems;
   o. Filters, clarifiers and clarifier mechanisms;
   p. Rakes, grinders;
   q. Disinfection systems;
   r. Presses (including belt presses);
   s. Conveyors, cranes;
   t. HVAC (excluding ductwork), water heaters, heat exchangers;
   u. Generators;

v. Cabinetry and housings (such as electrical boxes/enclosures);
w. Lighting fixtures;
x. Electrical conduit;
y. Emergency life systems;
z. Metal office furniture, shelving;
aa. Laboratory equipment, analytical instrumentation; and
bb. Dewatering equipment.

3. Raw materials such as iron ore, limestone, and iron/steel scrap are not covered by the AIS requirement. If any raw materials are being applied as a coating, the raw materials are similarly not covered.

C. AIS Requirements

1. For each item that meets the criteria indicated in Sections III.A, the iron and steel products contained in that item must be "produced in the United States (US)".
   a. All manufacturing processes must take place in the US, with the exception of metallurgical processes involving the refinement of steel additives.
   b. Manufacturing processes covered by the AIS requirement include: melting, refining, forming, rolling, drawing, refining, finishing, fabricating, coating.
   c. In the case of reinforced precast concrete, the casting of the concrete must also occur in the US. The cement and other raw materials used in the concrete production may come from non-US sources.
   d. Each domestic iron and steel product must remain in the US for the entire manufacturing process; otherwise, it will be considered foreign source material.
   e. Non-iron or steel components of an iron and steel product may come from non-US sources.

2. The construction contract language contained in **Appendix 4 of the attached final EPA AIS guidance** must be included in the CWF contract documents in order to obtain CWF approval of the engineering plans and specifications.

3. Certification for AIS compliance
   a. Certification must be provided for all items in Section III.A.
   b. Types of Certification
      i. Step certification process: Each handler (supplier, fabricator, manufacturer, processor, etc) of the iron and steel products certifies that their step in the process was domestically performed.
      ii. Final manufacturer certification: Alternatively, the final manufacturer that delivers the iron or steel product to the worksite, vendor, or contractor, may provide a certification asserting that all manufacturing processes occurred in the US.
   c. AIS compliance certification must be provided on company letterhead, in the format provided by **Appendix 5 of the attached final EPA AIS guidance**.
   d. These certifications shall be collected and maintained by the municipality, and must be available upon request by either the EPA or the DEEP.

D. Waiver Request Process

1. A waiver from the AIS requirement may be requested for a CWF project if at least one of the following conditions is sufficiently demonstrated:
   a. The AIS requirement will increase the cost of the overall project by more than 25 percent, as demonstrated by the inclusion of a bid alternate and backup calculations;

b. The iron and steel products are not produced in the United States in sufficient and "reasonably available quantities" and of "satisfactory quality", as demonstrated by soliciting proposals from at least three manufacturers; or
c. The AIS requirement is inconsistent with the public interest.

2. Waiver Request Format
   a. The waiver request must include a table with responses to the "Information Checklist for Waiver Request" in **Appendix 1 of the attached final EPA AIS guidance**.
   b. Evaluation of the waiver request shall include the criteria in the "HQ Review Checklist for Waiver Request" in **Appendix 2 of the attached final EPA AIS guidance.**
   c. Waiver requests shall be submitted to the Connecticut Department of Energy and Environmental Protection (DEEP) for initial screening.
   d. If the DEEP determines that a waiver to the AIS requirement has been sufficiently demonstrated, the DEEP will forward the waiver request to the EPA.

3. Final Waiver Determination
   a. The waiver request shall be made available on the EPA website and the DEEP CWF webpage.
   b. The EPA shall allow for informal public input for at least 15 days prior to making a determination.

IV. DEFINITIONS

AIS: American Iron and Steel

Assistant recipients: A borrower or grantee that receives funding from a State CWSRF program. In the case of Connecticut CWF projects, "assistance recipients" are the municipalities, as defined below.

CGS: Connecticut General Statutes

Construction materials: Construction materials are those articles, materials, or supplies made primarily of iron and steel, that are permanently incorporated into the applicable project, not including mechanical and/or electrical components, equipment and systems.

Some construction materials may overlap with what is also considered "structural steel". This includes, but is not limited to, the following products: wire rod, bar, angles, concrete reinforcing bar, wire, wire cloth, wire rope and cables, tubing, framing, joists, trusses, fasteners (i.e., nuts and bolts), welding rods, decking, grating, railings, stairs, access ramps, fire escapes, ladders, wall panels, dome structures, roofing, ductwork, surface drains, cable hanging systems, manhole steps, fencing and fence tubing, guardrails, doors, and stationary screens.

CWF: Connecticut Clean Water Fund

CWSRF: Clean Water State Revolving Fund

DEEP: Connecticut Department of Energy and Environmental Protection

Electrical equipment: Electrical equipment is typically any machine powered by electricity and includes components that are part of the electrical distribution system.

EPA: Federal Environmental Protection Agency

FWPCA: Federal Water Pollution Control Act

Final EPA AIS Guidance: This refers to the attached EPA Memorandum entitled "Implementation of American Iron and Steel provisions of P.L. 113-76, Consolidated Appropriations Act, 2014" dated March 20, 2014.

HVAC: Heating, ventilation, and air conditioning

Municipality: Any "municipality" eligible for the CWF, as defined in Section 22a-475 of the CGS. The municipalities are the "assistance recipients" for the purposes of the AIS requirement.

Iron and Steel Products: The term "iron and steel products" means the following products are made of "primarily iron or steel": lined or unlined pipes and fittings, manholes covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.

Mechanical equipment: Mechanical equipment is typically that which has motorized parts and/or is powered by a motor.

Municipal castings: Municipal castings are cast iron or steel infrastructure products that are melted and cast. They typically provide access, protection, or housing for components incorporated into utility owned drinking water, storm water, wastewater, and surface infrastructure. They are typically made of grey or ductile iron, or steel. Examples of municipal castings are:

- Access Hatches;
- Ballast Screen;
- Benches (Iron or Steel);
- Bollards;
- Cast Bases;
- Cast Iron Hinged Hatches, Square and Rectangular;
- Cast Iron Riser Rings;
- Catch Basin Inlet;
- Cleanout/Monument Boxes;
- Construction Covers and Frames;
- Curb and Corner Guards;
- Curb Openings;
- Detectable Warning Plates;
- Downspout Shoes (Boot, Inlet);
- Drainage Grates, Frames and Curb Inlets;
- Inlets;
- Junction Boxes;
- Lampposts;
- Manhole Covers, Rings and Frames, Risers;
- Meter Boxes;
- Service Boxes;
- Steel Hinged Hatches, Square and Rectangular;
- Steel Riser Rings;

- Trash receptacles;
- Tree Grates;
- Tree Guards;
- Trench Grates; and
- Valve Boxes, Covers and Risers.

Primarily Iron or Steel: To be considered "primarily iron or steel", the product must be made of greater than 50% iron or steel, measured by cost. The cost should be based on the material costs.

P.L.: Public Law

Production in the US: For the purposes of the AIS requirement, "production in the US" of the iron or steel used in an applicable product requires that all manufacturing processes must take place in the US, except metallurgical processes involving refinement of steel additives.

Reasonably Available Quantity: The quantity of iron or steel products is available or will be available at the time needed and place needed, and in the proper form or specification as specified in the project plans and design.

Satisfactory Quality: The quality of iron or steel products, as specified in the project plans and designs.

SCADA: Supervisory control and data acquisition

Steel: An alloy that includes at least 50 percent iron, between 0.02 and 2 percent carbon, and may include other elements. Metallic elements such as chromium, nickel, molybdenum, manganese, and silicon may be added during the melting of steel for the purpose of enhancing properties such as corrosion resistance, hardness, or strength. The definition of steel includes carbon steel, alloy steel, stainless steel, tool steel, and other specialty steels.

Step Certification: A step certification is a process under which each handler (supplier, fabricator, manufacturer, processor, etc.) of the iron and steel products certifies that their step in the process was domestically performed.

Structural steel: Structural steel is rolled flanged shapes, having at least one dimension of their cross-section three inches or greater, which are used in the construction of bridges, buildings, ships, railroad rolling stock, and for numerous other constructional purposes. Such shapes are designated as wide-flange shapes, standard I-beams, channels, angles, tees and zees. Other shapes include H-piles, sheet piling, tie plates, cross ties, and those for other special purposes. Some structural steel may overlap with what is also considered "construction materials" (see definition above).

RCSA: Regulations of the Connecticut State Agencies

US: United States

VFDs: Variable frequency drives

WRRDA: Water Resources Reform and Development Act of 2014

5/28/2015
Date

George V. Hicks, P.E.
Supervising Sanitary Engineer
Bureau of Water Protection & Land Reuse

Attachment: EPA Memorandum: "Implementation of American Iron and Steel provisions of P.L. 113-76, Consolidated Appropriations Act, 2014" dated March 20, 2014.

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____ (Bidder's Name) as Principal, and _____ (Name of Surety) as Surety, are hereby held and firmly bound unto the Town of Stratford as OWNER in the penal sum of _____ for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors, and assigns.

Signed, this _____ day of _____, 20___.

The Condition of the above obligation is such that whereas the Principal has submitted to the Town of Stratford a certain BID, attached hereto and hereby made a part hereof to enter in a contract in writing, for the Flood Protection Project / Water Pollution Control / BID #2026-15. In the event the Principal fails to complete and execute the Agreement to the said Bid and to complete the other requirements of said Bid, then the Surety shall pay over to the Owner the penal sum set forth above.

NOW, THEREFORE,

(a) If said BID shall be rejected, or in the alternate,

(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing material in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID,

then this obligation shall be void, otherwise the same shall remain in force and effect, it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

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

_____ (L.S.)
Principal

_____
Surety

BY: _____ (SEAL)

IMPORTANT – Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.

END OF SECTION

THE BIDDER SHALL COMPLETE THIS STATEMENT AND SUBMIT IT WITH HIS BID.

All questions must be answered and the information given must be accurate, clear, and comprehensive. This statement must be notarized. If necessary, questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder.

_____

2. Bidder's Internal Revenue Service Tax I.D. Number.

_____

3. Permanent main office address and telephone number.

_____

_____

4. When organized.

_____

5. If an entity, what type and where organized.

_____

6. How many years has your company been engaged in construction under your present firm or trade name?

_____

7. Describe the general character of work performed by you.

_____

_____

8. Has your company ever failed to complete any work awarded to you? If so, give dates, project names and reasons therefore.

_____

_____

9. Has your company ever defaulted on a contract? If so, when, where and why?

_____

_____

10. List the construction experience of the principal individuals of your organization.

INDIVIDUAL'S NAME	YEARS OF CONSTRUCTION EXPERIENCE	PRESENT POSITION AND YEARS OF EXPERIENCE	PREVIOUS POSITION AND YEARS OF EXPERIENCE	DOLLAR VOLUME RESPONSIBILITY

11. Has any officer, director, stockholder, partner, or member, as applicable, of your organization ever been an officer, director, stockholder, partner, or member of some other organization that failed to complete a construction contract?

If so, state name of individual, other organization, dates, projects, and reasons therefore.

12. Has any officer, director, stockholder, partner, or member of your organization ever failed to complete a construction contract handled in its name?

If so, state name of individual and reason(s) therefore.

13. In what other business do you or your entity have a financial interest?

14. List of contracts that will show the various types of work completed by your organization in the past five (5) years and/or presently under construction.

NAME AND ADDRESS* OF OWNER	NAME AND LOCATION OF PROJECT-KIND OR WORK	NAME OF PRIME CONTRACTOR, IF YOU ARE A SUBCONTRACTOR	CONTRACT PRICE	Was the contract completed on time? If NO, explain why under No. 16	Were there any penalties imposed? If YES, give amount and explain under No. 16	Were there any liens, claims, or stop notices filed against the job? If YES, explain under No. 16

*Address must be adequate to assure reply to inquiry and verification

15. PLANT AND EQUIPMENT

List equipment owned and indicate those available for this contract. Also list and indicate separately, equipment under lease or otherwise available to you, with attached explanation of the arrangements.

The list of equipment should be identical with those shown in your Financial Statement, and must be shown below to be credited with the technical evaluation of your application.

QUANTITY	ITEM	SIZE OR CAPACITY	CONDITION	YEARS OF SERVICE

16. Explanation of details in connection with non-completion of contracts; penalties imposed; liens, claims, and stop notices filed against contracts under No. 14.

17. If you are a parent organization and desire to do business in Connecticut through branch offices, indicate below the official name and address of each branch:

NAME	ADDRESS

18. Will you, upon request, provide a detailed financial statement and furnish any other information that may be required by the Owner?

19. Have you, in the past ten (10) years, been a party to mediation, arbitration or litigation proceedings arising out of or relating to your performance on a construction project. If so, identify the name of the proceeding, the nature of the claim against or by you, the venue of the proceeding and the outcome.

20. The undersigned hereby authorizes and requests any persons, firm, or corporation to furnish any information requested by the Owner in verification of the recitals comprising this Statement of Bidder's Qualifications.

Dated at _____ this _____ day of

_____, 20_____.

_____
(Name of Bidder)

By: _____

Title: _____

State of _____)
SS:
County of _____)

_____ being duly sworn, deposes and says

that he is _____ of _____
and that the answers to the foregoing questions and all statements therein are true and correct and sworn under penalties of perjury.

Subscribed and sworn to before me this ____ day of _____, 20___.

_____
(Signature)

(Notary Seal)

_____
(Notary Signature)

My Commission Expires: _____

END OF SECTION

CERTIFICATE OF SURETY

The undersigned hereby certify that they are the duly authorized agents of _____ duly authorized to do business in the State of Connecticut, and agree to furnish to _____ a surety bond for the faithful performance of any and all provisions contained in the Specifications and Contract.

The maximum amount that we will be surety for is $ _____.

_____
SURETY COMPANY OR AGENT

ATTEST:

_____
WITNESS

THE TERMS OF THE SURETY COMPANY FOR FURNISHING THE BOND ARE HEREBY ACCEPTED.

_____
NAME OF BIDDER

BY: _____

TITLE: _____

IMPORTANT! THIS FORM MUST BE FILLED IN BY BIDDER.

STATEMENT OF COMPLIANCE WITH BIDDING REQUIREMENTS

_____ hereby certify that _____ has furnished all information required in the Bid Form and the following have been executed:

1. STATEMENT OF BIDDER'S QUALIFICATIONS
2. BID BOND
3. CERTIFICATE OF SURETY

_____
NAME OF BIDDER

BY: _____

TITLE: _____

ATTEST:

_____
WITNESS

IMPORTANT! THIS FORM MUST BE FILLED IN BY BIDDER.

SECTION 00 45 19 NON-COLLUSION AFFIDAVIT OF PRIME BIDDER

State of: _____)
) SS:
County of: _____)

_____, being first duly sworn, deposes and says that:

(1) He is _____ of _____
_____, the Bidder that has submitted the attached Bid;

(2) He is fully informed respecting the preparation and contents of the attached Bid and of all pertinent circumstances respecting such Bid;

(3) Such Bid is genuine and is not a collusive or sham Bid;

(4) Neither the said Bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Bid in connection with the Contract for which the attached Bid has been submitted or to refrain from bidding in connection with such Contract, or has in any manner, directly or indirectly, sought by agreement or collusion or communication or conference with any other Bidder, firm or person to fix the price or prices in the attached Bid price of any Bidder, or to fix any overhead, profit or costs element of the Bid price or the Bid price of any Bidder, or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the Town of Stratford or any person interested in the proposed Contract; and

(5) The price or prices quoted in the attached Bid are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed) _____

(Title) _____

Subscribed and sworn to before me this

_____ day of _____, 20____.

_____ (Signed)

_____ (Title)

My Commission Expires: _____

END OF SECTION

SECTION 00 45 20 NON-COLLUSION AFFIDAVIT OF SUBCONTRACTOR

State of: _____)
) SS:
County of: _____)

_____, being first duly sworn, deposes and says that:

(1) He is _____ of _____
_____, hereinafter referred to as the "Subcontractor";

(2) He is fully informed respecting the preparation and contents of the Subcontractor's Proposal submitted by the Subcontractor to _____
_____, the Contractor for certain work in connection with BID #2026-15 Flood Protection Project Contract pertaining to the Project in Stratford, Fairfield, Connecticut (City, County and State);

(3) Such Subcontractor's Proposal is genuine and is not a collusive or sham Proposal;

(4) Neither the Subcontractor nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other Bidder, firm or person to submit a collusive or sham Proposal in connection with such Contract, or has in any manner, directly or indirectly, sought by unlawful agreement or connivance with any other Bidder, firm or person to fix the price or prices in said Subcontractor's Proposal, or to fix overhead, profit or costs element of the price or prices in said Subcontractor's Proposal, or to secure through collusion, conspiracy, connivance or unlawful agreement any advantage against the Town of Stratford or any persons interested in the proposed Contract; and

(5) The price or prices quoted in the Subcontractor's Proposal are fair and proper and are not tainted by any collusion, conspiracy, connivance or unlawful agreement on the part of the Bidder or any of its agents, representatives, owners, employees, or parties in interest, including this affiant.

(Signed) _____

(Title) _____

Subscribed and sworn to before me this

_____ day of _____, 20____.

_____ (Signed)

_____ (Title)

My Commission Expires: _____

END OF SECTION

TO: _____

_____

_____

PROJECT: BID #2026-15 / Flood Protection Project / Water Pollution Control

The OWNER has considered the BID submitted by you for the above-described WORK in response to its Advertisement for Bids dated _____, 20___ and its information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of:

_____

_____ $ _____

You are required by the information for Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) calendar days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law, and the bid documents.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 20___.

Town of Stratford (OWNER)

_____ (AUTHORIZED SIGNATURE)

_____ (NAME)

_____ (TITLE)

ACCEPTANCE OF NOTICE:

Receipt of the above NOTICE OF AWARD is hereby acknowledged by:

_____, this _____ day of _____, 20___.

_____ (SIGNATURE)

_____ (NAME)

_____ (TITLE)

END OF SECTION

CONTRACT

This AGREEMENT, made this _____ day of _____, 20___ A.D. by and between the TOWN OF STRATFORD, in the County of Fairfield, a municipal corporation of the State of Connecticut, part of the first part, and _____ a corporation with its principal place of business in _____ part of the second part, (hereafter called the Contractor).

WITNESSETH. That for and in consideration of the premises and the agreement herein contained, and the payments herein provided to be made, the parties hereto agree as follows:

FIRST. The Contractor agrees to accept and abide by the provisions of Title 31, Section 53 of the 1965 Supplement to the General Statutes, State of Connecticut, which require "The wages paid on an hourly basis to any person performing the work of any mechanic, laborer or worker on the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such person to any employee welfare fund, as defined in subsection (h) of this section, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such persons to any such employee welfare fund shall pay to each mechanic, laborer or worker as part of such person's wages the amount of payment or contribution for such person's classification on each pay day."

SECOND. The Contractor further covenants and agrees at its own proper cost, charge, and expense to furnish all machinery, appliances, tools, labor and materials necessary or proper to do all the work necessary to construct all the works, equipment and fixtures, appurtenant thereto, as set forth in the Contractor's Bid, annexed hereto, known as BID #2026-15 Flood Protection Project and described in the Plans and Specifications, made and prepared by GZA GeoEnvironmental, Inc. for the Town of Stratford, and as described in the Contract Documents, as defined below in the Fifth Section of this Contract, which are all incorporated by reference and are wholly made part of this Contract to the same extent as though the same were herein expressly written, in a first-class workmanlike manner, and in strict accordance with all terms contained in this Contract and the Contract Documents. Such work will be performed under the supervision of the Responsible Town Official (herein "RTO"), who for the purposes of this Contract, shall be the Town Engineer of the Town of Stratford and/or his appointed agent.

THIRD. The Contractor agrees to commence with work required by the Contract Documents within ten (10) calendar days after a day to be specified in the Notice to Proceed, to install and fully complete the project in agreed upon days, in strict accordance with the dates outlined in Section 01 14 10 – Special Requirements, unless the period for completion is extended otherwise by the Contract Documents. Work performed beyond this Contract Time period (for completion) will be subject to liquidated damages. The Contractor agrees to pay as liquidated damages the sum of two thousand five hundred ($2,500.00) dollars for each consecutive calendar day thereafter as provided by the General Conditions.

CONTRACT

FOURTH. In consideration of the Contractor faithfully complying with all the terms and stipulations of this Contract as set forth herein, or in the Plans and Specifications therefore, advertisement, proposal and other Contract Documents, the Town of Stratford covenants and agrees to pay the said Contractor at the time and times, and in the manner more particularly set forth in the General Conditions, and Connecticut Department of Transportation Form 819 to the extent that such applies to this project, which are made a part of this Contract.

FIFTH. The Contractor agrees to indemnify, defend and hold harmless the Town of Stratford, its employees, agents and servants from any and all claims or demands for damages or injuries to either person or property which arise or may arise out of the performance of this Contract, and shall indemnify and insure the Town of Stratford in the manner more particularly set forth in the Insurance Requirements, which are made part of this Contract.

SIXTH. The term "Contract Documents" shall mean and include the following:

Invitation to Bid
Instructions for Bidders/Terms and Conditions of Bid
Bid Form
Bid Bond
Statement of Bidder's Qualifications
Certificate of Surety
Statement of Compliance with Bidding Requirements
Non-Collusion Affidavit of Prime Bidder
Non-Collusion Affidavit of Subcontractor
Notice of Award
Contract
Acknowledgement of Officer of Town Executing Contract
Acknowledgement of Corporate Contractor
Acknowledgement of Contractor, if an Individual
Performance and Labor and Material Bond
Certificate of Insurance
Notice to Proceed
Change Order
Maintenance Bond
Town of Stratford, Standard Insurance Requirements
Certificate of Substantial Completion
Waiver of Liens Prime Contractor
Certificate of Final Payment and Completion of Work
General Conditions / Special Requirements
Technical Specifications and Drawings prepared by GZA GeoEnvironmental, Inc.
Entitled: "Water Pollution Control Facility Flood Protection System Improvements.
100% Design Drawings July 2024 / Contract #2026-15 / Revision #2 / Issued 1/29/2026"

Addendum No. _____, dated _____, 20___

Addendum No. _____, dated _____, 20___

CONTRACT

IN WITNESS WHEREOF, the Town Council of the Town of Stratford, in the County of Fairfield has authorized the Corporate Seal of the Town of Stratford to be hereto affixed and this Contract to be signed by the Mayor and that same attested to by the Town Clerk and the Contractor has caused this Contract to be signed by its duly authorized officer, and its corporate seal to be hereunto affixed all the day and year first above written.

ATTEST:

By: _____
Town Clerk

TOWN OF STRATFORD:

By: _____
David Chess, Mayor

Date: _____

ATTEST:

By: _____

_____
Name, Title

CONTRACTOR: _____

By: _____

_____
Name, Title

Date: _____

ACKNOWLEDGEMENT OF OFFICER OF TOWN EXECUTING CONTRACT

State of: _____)
) SS:
County of: _____)

Be it remembered, that on this _____ day of _____, 20___ before me personally appeared David Chess, known to me to be the Mayor of the Town of Stratford, who, being first duly sworn deposes and says that:

1. That she knows the seal of the Town of Stratford.

2. The seal affixed to this Contract between the Town of Stratford and _____ _____, dated the _____ day of _____, 20___, is the seal of the Town of Stratford.

3. That the seal was so affixed and the Contract signed and delivered by David Chess who was at the date thereof the Mayor of the Town of Stratford.

4. The said seal was affixed and the Contract delivered in the presence of deponent.

5. At the same time the said Mayor acknowledged that she signed, sealed and delivered the same as her voluntary act and deed.

6. At the same time deponent signed her name to said contract as an attesting witness to the execution thereof.

_____
TOWN CLERK

SUBSCRIBED AND SWORN TO, BEFORE ME:

_____
NOTARY PUBLIC

A NOTARY PUBLIC OF THE STATE OF CONNECTICUT

MY COMMISSION EXPIRES: _____

ACKNOWLEDGEMENT BY SECRETARY OF CORPORATE CONTRACTOR

State of: _____)
) SS:
County of: _____)

Be it remembered, that on this _____ day of _____, 20___ personally appeared _____ who, being first duly sworn, deposes and says:

1. He is the secretary of _____ (Name of Corporation) the Contractor named in the foregoing contract.

2. He well knows the seal of said corporation and the seal affixed to the Contract between the Town of Stratford and _____ _____, dated the _____ day of _____, 20___, is in fact the seal of the corporation.

3. The seal was affixed and the Contract signed and delivered by _____ _____ (Name of Officer Who Signed) who was, on the date of signing, the _____ (Title of Officer Who Signed) of the corporation, and who acknowledged that he signed, sealed and delivered the same as his voluntary act and deed and as the voluntary act and deed of the corporation.

4. The Contract was signed and the corporate seal affixed in the presence of deponent who subscribed the Contract as an attesting witness to the execution thereof.

_____
SECRETARY

SUBSCRIBED AND SWORN TO, BEFORE ME:

_____
NOTARY PUBLIC

A NOTARY PUBLIC OF THE STATE OF CONNECTICUT

MY COMMISSION EXPIRES: _____

ACKNOWLEDGEMENT OF CONTRACTOR, IF A PARTNERSHIP

State of: _____)
) SS:
County of: _____)

Be it remembered, that on this _____ day of _____, 20___ before me the subscriber _____ personally appeared _____ who, I am satisfied _____ _____ the _____ mentioned in the within _____ Instrument, to who I first made know of the content thereof, and thereupon acknowledge that _____ signed, sealed and delivered the same as _____ voluntary act and deed, for the uses and purposes therein expressed.

_____
NOTARY PUBLIC

A NOTARY PUBLIC OF THE STATE OF CONNECTICUT

MY COMMISSION EXPIRES: _____

ACKNOWLEDGEMENT OF CONTRACTOR, IF AN INDIVIDUAL

State of: _____)
) SS:
County of: _____)

Be it remembered, that on this _____ day of _____, 20___ before me the subscriber _____ personally appeared _____ who, I am satisfied _____ _____ the _____ mentioned in the within Instrument, to who I first made know of the content thereof, and thereupon _____ _____ acknowledged that_____ signed, sealed and delivered the same as _____ voluntary act and deed, for the uses and purposes therein expressed.

_____
NOTARY PUBLIC

A NOTARY PUBLIC OF THE STATE OF CONNECTICUT

MY COMMISSION EXPIRES: _____

PERFORMANCE AND LABOR AND MATERIAL BOND

KNOW ALL MEN BY THESE PRESENTS, that

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____ , hereinafter called Principal
(Corporation, Partnership, Limited Liability Company, or Individual)

and _____
(Name of Surety)

_____ , hereinafter called Surety
(Address of Surety)

are held and firmly bound unto _____
(Name of Owner)

_____
(Address of Owner)

hereinafter called Owner, in the penal sum of _____

_____ Dollars, $ (_____)

in lawful money of the United States of America, for the payment of which, well and truly to be made to the Owner, we bind ourselves, our heirs, successors and assigns, jointly and severally, firmly by these presents.

Signed, Sealed and Delivered this _____ day of _____, 20___.

THE CONDITION OF THIS OBLIGATION is such that the Principal has entered into a certain written Contract with the Owner, dated the_____ day of_____, 20___, which Contract provides for the construction of the Flood Protection Project, and which Contract, together with all Plans and Specifications now or hereafter made in extension, modification or alteration thereof, are incorporated in and made a part of this bond as though herein fully set forth.

NOW, THEREFORE, if the Principal shall well and truly keep, perform, and execute all the terms, conditions, and stipulations of the Bid Contract on his (its) part to be kept, performed, and executed according to the provisions of said Contract and shall promptly pay for all materials furnished and labor supplied or performed in the prosecution of the work included in and under the aforesaid Contract, whether or not the material or labor enters into and becomes a component part of the real property, and shall indemnify and reimburse the Owner for any loss that it may suffer through the failure of the Principial to faithfully observe and perform each and every obligation and duty imposed upon the Principal by said Contract at the time and in the manner therein specified or to pay for all such materials furnished and labor supplied or performed, then this obligation shall be null and void, otherwise it shall remain and be in full force and effect.

PERFORMANCE AND LABOR AND MATERIAL BOND

PROVIDED, HOWEVER, that any alterations which may be made in the terms of said Contract, or in the work done or to be done under it, or the giving by the Owner of any extension of time for the performance of said Contract or any other forbearance on the part of either the Owner or the Principal one to the other, shall not in any way release the Principal and the Surety, or either of their representatives, heirs, executors, administrators, successors or assigns from liability hereunder, notice to the surety of any such alterations, extensions or forbearance being hereby specifically and absolutely waived.

AND FURTHER PROVIDED that any party, whether a subcontractor or otherwise, who furnishes materials or supplies or performs labor or services in the prosecution of the work under said Contract, and who is not paid therefore, may bring a suit on this bond in the name of the Owner, prosecute the same to a final judgment and have execution thereon for such sum or sums as may be justly due, provided, however, that the Owner shall not be liable to furnish counsel nor to pay any costs or expenses of any such suit.

IN WITNESS WHEREOF, _____
(Principal)
has hereunto affixed his hand and seal causes this Instrument to be signed by:

_____, its _____
(Signature) (Title)
duly authorized, and its corporate seal to be hereunder affixed, and has caused this Instrument to be signed by:

_____, its _____
(Signature) (Title)
duly authorized, and its corporate seal to be here unto affixed, this

_____ day of _____, 20___.

WITNESSED:

_____ _____ (SEAL)
PRINCIPAL

_____

_____ BY: _____
ITS

_____ _____
SURETY

_____

CERTIFICATE OF INSURANCE

_____ hereby certifies

_____ have submitted to the

_____ (Name of Municipality) Proof of Carriage of Insurance in the form required by the Contract Specifications.

_____

CONTRACTOR

_____

WITNESS

CERTIFICATE OF TOWN ATTORNEY

I, the undersigned _____ the duly authorized and, acting legal representative of and counsel to the Town of Stratford do hereby certify as follows:

> I have examined the foregoing Contract, Performance Bond, Payment Bond, Insurance Policies and Certificates, the General Terms and Conditions of the Contract Specifications and the manner of the execution thereof. I am of the opinion that the aforesaid documents constitute valid and legally binding obligations upon the parties executing the same in accordance with the terms, conditions and provisions thereof.

_____

ATTORNEY

_____

DATE

Dated: _____ , 20 _____

TO: _____

_____

_____

PROJECT: BID #2026-15 / Flood Protection / Water Pollution Control

CONTRACT FOR: _____

_____ $ _____

You are hereby notified to commence WORK in accordance with the Agreement dated _____, 20___ on or before _____, 20___ and you are to complete the WORK within _____ consecutive calendar days thereafter. The date of completion of all WORK is therefore _____, 20___.

Town of Stratford (OWNER)

_____ (AUTHORIZED SIGNATURE)

_____ (NAME)

_____ (TITLE)

ACCEPTANCE OF NOTICE:

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by:

_____, this _____ day of _____, 20___.

_____ (SIGNATURE)

_____ (NAME)

_____ (TITLE)

END OF SECTION

(Instructions on Page 2)

CHANGE ORDER NO. _____

PROJECT: BID #2026-15 / Flood Protection Water Pollution Control

DATE OF ISSUANCE: _____

OWNER: Town of Stratford

CONTRACTOR: _____

ENGINEER: GZA, Inc.

ENGINEER's Project No. 18.0172256.70

You are directed to make the following changes in the Contract Documents:

Description: _____

Purpose of Change Order: _____

Attachments: _____

CHANGE IN CONTRACT PRICE:	CHANGE IN CONTRACT TIME:
Original Contract Price $ _____	Original Contract Time _____ Days or Date
Previous Change Order No. ___ to ___ $ _____	Net change from previous Change Orders _____ Days
Contract Price prior to this Change Order $ _____	Contract Time Prior to this Change Order _____ Days or Date
Net Increase (Decrease) of this Change Order $ _____	Net Increase (Decrease) of this Change Order _____ Days
Contract Price with all approved Change Orders $ _____	Contract Time with all approved Change Orders _____ Days or Date

RECOMMENDED: **APPROVED:** **APPROVED:**

Engineer Owner Contractor

INSTRUCTIONS

A. GENERAL INFORMATION:

1. This document was developed to provide a uniform format for handling contract changes that affect Contract Price or Contract Time. Changes that have been initiated by a Work Directive Change must be incorporated into a subsequent Change Order if they affect Price or Time.
2. Changes that affect Contract Price or Contract Time should be promptly covered by a Change Order. The practice of accumulating change order items to reduce the administrative burden may lead to unnecessary disputes.
3. For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Time, a Field Order may be used.

B. COMPLETING THE CHANGE ORDER FORM:

1. The Engineer initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by the Contractor, or requests from the Owner, or both.
2. Once the Engineer has completed and signed the form, all copies should be sent to the Contractor for approval. After approval by the Contractor, all copies should be sent to the Owner for approval. The Engineer should make distribution of executed copies after approval by the Owner.
3. If a change only applies to price or to time, cross out the part of the tabulation that does not apply.

END OF SECTION

MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____(Contractor) as Principal, and _____(Name of Surety) as Surety, are held and firmly bound unto the Town of Stratford, Connecticut, hereinafter called the "Town", in the final sum of _____ Dollars ($ _____) lawful monies of the United States for the payment of which sum will and truly be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has executed an Agreement, dated _____, 20 , for the Contract BID #2026-15 Flood Protection.

NOW THEREFORE, the Principal agrees to maintain the work completed in the Contract, stated above, for a period of twelve (12) months from the date of Final Payment and issuance of a Certificate of Completion, without additional costs to the Town. Failure to comply with such required work shall constitute a violation and all monies covered by this Bond shall become payable to the Town.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under several seals this day of , 20 , the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

In the presence of:

_____ _____ (Seal)
(Individual Principal)

_____ _____
(Business Address Line 1)

_____

_____ (Seal)
(Partnership)

_____
(Business Address Line 1)

_____

MAINTENANCE BOND

Attest: By: _____

_____ _____
(Corporate Principal)

_____
(Business Address)

_____

Attest: By: _____

_____ _____
(Corporate Surety)

_____
(Business Address)

_____

_____ _____ (Seal)
Countersigned By:

_____ _____

Power-of-Attorney for Persons signing Surety Company must be attested to Bond.

SECTION 00 65 16 CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT: BID #2026-15 / Flood Protection / Water Pollution Control

ENGINEER'S Project No. 18.0172256.70

CONTRACTOR: _____

CONTRACT FOR: _____ CONTRACT DATE: _____

This Certificate of Substantial Completion applies to all WORK under the CONTRACT DOCUMENTS or to the following specified parts thereof:

_____

_____

_____

_____

_____

_____

_____

_____

To Town of Stratford
OWNER

And to _____
CONTRACTOR

The WORK to which this Certificate applies has been inspected by authorized representatives of OWNER, CONTRACTOR, and ENGINEER and WORK is hereby declared to be substantially complete in accordance with the CONTRACT DOCUMENTS on:

_____
Date of Substantial Completion

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include an item in it does not alter the responsibility of CONTRACTOR to complete all the WORK in accordance with the CONTRACT DOCUMENTS. The items in the tentative list shall be completed or corrected by CONTRACTOR within ___ days of the above date of Substantial Completion.

The following documents are attached to and made a part of this Certificate:

This Certificate does not constitute an acceptance of WORK not in accordance with the CONTRACT DOCUMENTS nor is it a release of the CONTRACTOR'S obligation to complete the WORK in accordance with the CONTRACT DOCUMENTS.

Executed by the ENGINEER on _____, 20___

GZA GeoEnvironmental, Inc.
ENGINEER

By _____

CONTRACTOR accepts this Certificate of Substantial Completion on _____, 20___

_____
CONTRACTOR

By _____

OWNER accepts this Certificate of Substantial Completion on _____, 20___

Town of Stratford
OWNER

By _____

END OF SECTION

SECTION 00 65 20 WAIVER OF LIENS PRIME CONTRACTOR

PROJECT: BID #2026-15 / Flood Protection / Water Pollution Control

OWNER: Town of Stratford

CONTRACTOR: _____ CONTRACT DATE: _____

The undersigned CONTRACTOR hereby swears under penalty of perjury that (1) all previous progress payments received from the OWNER on account of WORK performed under the CONTRACT referred to above have been applied by the undersigned to discharge, in full, all obligations of the undersigned incurred in connection with WORK covered by prior Pay Estimates for Partial Payment under said CONTRACT, being Pay Estimates number 1 through _____ inclusive; and (2) all labor, materials and equipment incorporated in said PROJECT or otherwise listed in or covered by these Pay Estimates for Partial Payment are free and clear of all liens, claims, bond claims, security interests and encumbrances, except those listed below by oblige, nature and amount of obligation and covered by appropriate BOND or BONDS, as listed beside each obligation and attached to and made a part of this certification.

Obligation	Bond
_____	_____
_____	_____

Dated: _____

_____
Signed

_____
Name

_____
Title

COUNTY OF _____

STATE OF _____

Before me on this _____ day of _____, 20____ personally appeared _____ known to me, who being duly sworn, did depose and save that he is the _____ of the Contractor above mentioned; that he executed the above statement on behalf of said Contractor and that all of the statements contained therein are true, correct and complete.

_____
NOTARY PUBLIC

My Commission Expires _____

END OF SECTION

PROJECT: BID #2026-15 / Flood Protection / Water Pollution Control

Agreement Date: _____

Project Description: _____

Completion Date per Agreement and Change Orders: _____

FINAL CERTIFICATION OF CONTRACTOR

(Insert Name and Complete Address of Contractor)

_____

_____

_____

_____

agrees to accept $ _____ as full and final payment for all WORK completed under this CONTRACT dated _____, 20___ with the Town of Stratford for the Flood Protection Project / Water Pollution Control / BID #2026-15.

I certify that all construction has been carried out in substantial compliance with the CONTRACT DOCUMENTS, and that all labor, equipment, materials and Subcontractors have been or will be paid in accordance with the requirements of the General Laws of the State of Connecticut.

_____ _____

Date Contractor

_____

Signed by Officer of Corporation

_____

Title

END OF SECTION

1. Definitions
2. Additional Instructions and Detail Drawings
3. Schedules, Reports, and Records
4. Drawings and Specifications
5. Shop Drawings
6. Materials, Services, and Facilities
7. Inspection and Testing
8. Substitutions
9. Patents
10. Surveys, Permits, and Regulations
11. Protection of Work, Property, and Persons
12. Hazardous Material
13. Supervision by Contractor
14. Changes in the Work
15. Changes in Contract Price
16. Time for Completion and Liquidated Damages
17. Correction of Work
18. Subsurface Conditions
19. Suspension of Work, Termination, and Delay
20. Payment to Contractor
21. Acceptance of Final Payment as Release
22. Insurance
23. Contract Security
24. Assignments
25. Indemnification
26. Separate Contracts
27. Subcontracting
28. Authority of the Engineer
29. Guarantee
30. Claims and Disputes
31. Taxes
32. Interpretation of Drawings and Specifications
33. Site Regulations
34. Limitations of Data Presented
35. Health and Safety Equipment
36. Review of Work
37. Final Inspection

1. DEFINITIONS:

   Whenever used in the CONTRACT DOCUMENTS, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:

   a. ADDENDA – Written or graphic instruments issued prior to the execution of the CONTRACT, which modify or interpret the CONTRACT DOCUMENTS and SPECIFICATIONS, by additions, deletion, clarifications, or corrections.

   b. AWARDING AUTHORITY – The authorized agent or representative of the OWNER as defined herein for which the PROJECT shall be undertaken.

   c. BID – The offer or proposal of the BIDDER submitted on the prescribed form setting forth the prices for the WORK to be performed.

   d. BIDDER – Any person, firm, or corporation submitting a BID for the WORK.

   e. BONDS – Bid, Performance, and Payment Bonds and other instruments of security, furnished by the CONTRACT and its Surety in accordance with the CONTRACT DOCUMENTS.

   f. CHANGE ORDER – A written order to the CONTRACTOR authorizing an addition, deletion, or revision in the WORK within the general scope of the CONTRACT DOCUMENTS, or authorizing an adjustment in the CONTRACT PRICE or CONTRACT TIME.

g. COMPLETION – That date, as certified by the ENGINEER, when the construction of the PROJECT (and all parts thereof) is fully completed in accordance with the CONTRACT DOCUMENTS, including but not limited to the satisfactory fulfillment of, in the opinion of the ENGINEER, all punch list items, correction of any defective WORK, start-up and training, testing of equipment, submission and approval of operations and maintenance manuals, and record drawings. Should the CONTRACTOR not achieve COMPLETION within the specified time, or extension of time granted by the OWNER, then the provisions of liquidated dates shall apply.

h. CONTRACT – The CONTRACT DOCUMENTS form the CONTRACT for construction. The CONTRACT represents the entire and integrated agreement between the OWNER and the CONTRACTOR and supersedes prior negotiations, representations, or agreements, either written or oral.

i. CONTRACT DOCUMENTS – CONTRACT DOCUMENTS is defined in the Agreement Form.

j. CONTRACT PRICE – The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.

k. CONTRACT TIME – The number of calendar days stated in the CONTRACT DOCUMENTS to achieve COMPLETION of the WORK.

l. CONTRACTOR – The person, firm, or corporation with whom the OWNER has executed the CONTRACT.

m. DAYS – Days, as used in this document, shall be calendar days unless specifically noted otherwise.

n. DRAWINGS – The part of the CONTRACT DOCUMENTS that show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.

o. ENGINEER – The term ENGINEER as used in the CONTRACT DOCUMENTS shall mean GZA GeoEnvironmental, Inc.

p. FIELD ORDER – A written order affecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, issued by the ENGINEER to the CONTRACTOR during construction.

q. NOTICE OF AWARD – The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.

r. NOTICE TO PROCEED – Written communication issues by the OWNER to the CONTRACTOR authorizing the CONTRACTOR to proceed with the WORK and establishing the date of commencement of the WORK.

s. OWNER – The term OWNER as used in the CONTRACT DOCUMENTS shall mean the Town of Stratford or other authorized representative.

t. PROJECT – The undertaking to be performed as provided in the CONTRACT DOCUMENTS.

u. PROJECT REPRESENTATIVE – The authorized representative of the OWNER who is assigned to the PROJECT site(s) or any part thereof.

v. SHOP DRAWINGS – All drawings, diagrams, illustrations, brochures, schedules, and other data which are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, supplier, or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.

w. SPECIFICATIONS – A part of the CONTRACT DOCUMENTS consisting of written descriptions of the technical nature of materials, equipment, construction systems, standard, and workmanship.

x. STATE – The State of Connecticut.

y. SUBCONTRACTOR – An individual, firm, or corporation having a direct contract with the CONTRACTOR, or with any other SUBCONTRACTOR, for the performance of a part of the WORK at the site(s).

z. SUBSTANTIAL COMPLETION – The date, as certified by the ENGINEER, when the construction of the PROJECT, or a specified part thereof, is sufficiently completed, in accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

aa. SUPPLEMENTAL CONDITIONS – Modifications to the GENERAL CONDITIONS required by an agency for participation in the PROJECT and approved by the agency in writing prior to inclusion in the CONTRACT DOCUMENTS, or such requirements that may be imposed by the OWNER, the ENGINEER or applicable STATE laws.

bb. SUPPLIER – Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a special design, but who does not perform labor at the site(s).

cc. WORK – All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.

dd. WRITTEN NOTICE – Any notice to any party to the CONTRACT relative to any part of this CONTRACT in writing and considered delivered and the service thereof completed, when posted by certified or registered mail, personally delivered, or e-mailed to the said party at its last given address or number or delivered in-person to said party or its authorized representative on the WORK. Whenever the words “as directed”, “as permitted”, “as required”, or words of lie effect are used, it shall be understood that the direction, permission, or requirements of the ENGINEER and/or the OWNER is intended, and similarly the words “approved”, “acceptable”, “satisfactory”, or words of like import shall mean approved or acceptable or satisfactory to the ENGINEER and/or the OWNER. Whenever the words “or equal” or words of like import are used, it shall be understood that

this means equal in accordance with the following provisions; an item shall be considered equal if in the opinion of the ENGINEER and/or the OWNER; (1) it is at least equal in quality, durability, appearance, strength, and design; (2) it will perform at least equally the function imposed by the general design for the work being contracted for or the material being purchased; and (3) it conforms substantially, even with deviations, to the detailed requirements for the item. Whenever any power is possessed by, or act or thing is to be done by the OWNER under this CONTRACT, the exercise of such power or the doing of such act or thing by the AWARDING AUTHORITY shall be a sufficient compliance with the terms of this CONTRACT unless by law some other officer of the OWNER is required to act in the premises. Both the address given in the BID upon which this CONTRACT is founded and the CONTRACTOR'S office at or near the site(s) of the WORK are hereby designated as places to either of which notices, letters, and any other communications to the CONTRACTOR may be certified mailed or delivered. The delivering to the above-named place(s), or depositing in a post-paid wrapper directed to the first named place, in any post office box regularly maintained by the Post Office Department, of any notice, letter, or other communications to the CONTRACTOR, shall be deemed sufficient service thereof upon the CONTRACTOR, and the date of said service shall be the date of such delivery or mailing or at the time and date of the e-mail confirmation. The first named postal address and/or e-mail address may be changed at any time by an instrument in writing, executed and acknowledged by the CONTRACTOR and delivered to the ENGINEER. Nothing herein contained shall be deemed to preclude or render inoperative the service of any notice, letter, or other communication upon the CONTRACTOR personally.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS:

   a. The CONTRACTOR may be furnished additional instructions and detail DRAWINGS by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.

   b. The additional DRAWINGS and instructions thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail DRAWINGS and instructions.

3. SCHEDULES, REPORTS, AND RECORDS:

   a. Prior to commencement of construction, the CONTRACTOR shall provide the ENGINEER and OWNER with his sequence of operations and his apportioned locations of WORK along with his associated projected dates of commencement and COMPLETION for each location of WORK, for OWNER review and approval. He shall also include a list of his manpower and equipment and which equipment he desires to leave overnight and/or for extended periods of time. He shall provide his desired proposed staging and storage areas, for OWNER review and approval. The CONTRACTOR shall not block, nor park within the fire lane(s), emergency access area(s), or within the public right-of-way.

b. Within ten (10) days after the WORK has commenced, the CONTRACTOR shall submit to the ENGINEER for approval a progress schedule in satisfactory form, showing in detail its proposed progress for the construction of the various parts of the WORK and the proposed times for receiving the various materials required. The CONTRACTOR shall, at the end of each month or more often if required by the circumstances and actual progress of the WORK, furnish the ENGINEER two (2) copies of a chart showing actual progress of the various parts of the WORK in comparison with the originally proposed progress schedule as approved.

c. The CONTRACTOR shall, within five (5) days of its receipt of a NOTICE TO PROCEED, submit a schedule of payments for the ENGINEER'S approval, that it anticipates it will earn during the course of the WORK.

d. The WORK is to commence within ten (10) calendar days after a date to be specified in SECTION 00 55 00, NOTICE TO PROCEED unless otherwise specified. WORK shall continue with dispatch to COMPLETION and no suspension of WORK will be allowed without approval of the ENGINEER.

e. No Saturday, Sunday, holiday, or WORK days longer than eight (8) hours requiring the presence of the ENGINEER or PROJECT REPRESENTATIVE will be permitted, without prior arrangements with the ENGINEER, except in the case of an emergency, and then only to the extent that is absolutely necessary, and, if practical, with the written permission of the ENGINEER. If Saturday, Sunday, holiday or WORK days longer than eight (8) hours are contemplated, the CONTRACTOR shall notify the ENGINEER not later than Friday of the previous week to allow arrangements to be made for observation. If the CONTRACTOR must work beyond the regular WORK week in order to complete the PROJECT within the CONTRACT TIME, all expenses of the ENGINEER and its personnel required for observation will be deducted monthly from any sums due or which will become due to the CONTRACTOR.
CONTRACTOR must adhere to Stratford Town Code - Chapter 142 Noise

f. Prior to commencing any WORK at the site(s) requiring the presence of the ENGINEER or its representative, the CONTRACTOR shall notify the ENGINEER in writing at least twenty-four (24) hours in advance of the exact date and time on which it intends to start the WORK. In the event that the CONTRACTOR fails to meet this Schedule, the charges to the OWNER for the on-site time of the ENGINEER will be assessed to the CONTRACTOR and will be deducted from any sums due or which will become due to the CONTRACTOR as part of Liquidated Damages.

4. DRAWINGS AND SPECIFICATIONS:

a. The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, transportation, and any other services necessary for proper and timely execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental WORK necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy, or operation by the OWNER. Any WORK shown on the DRAWINGS, though not mentioned in the

SPECIFICATIONS, and any WORK mentioned in the SPECIFICATIONS, though not shown on the DRAWINGS, is to be executed by the CONTRACTOR as a part of the WORK.

b. In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scaled dimensions, and detail DRAWINGS govern over general DRAWINGS.

c. Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS, shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after the discovery of such discrepancies, inconsistencies, or ambiguities shall be done at the CONTRACTOR'S risk. The CONTRACTOR shall confirm that the information included in the DRAWINGS and SPECIFICATIONS complies with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities. If the DRAWINGS and SPECIFICATIONS conflict with applicable laws, statutes, ordinances, codes, riles and regulations, or lawful orders of public authorities, the CONTRACTOR shall notify the ENGINEER of the conflict.

d. In the event of any duplication, conflict or discrepancy, the method of WORK, materials and equipment, which is in the best interest of OWNER, regardless of whether such method, materials or equipment results in additional costs for the CONTRACTOR, shall be construed as the requirement. When the WORK is shown in greater quantity on documents of lower priority then the lower priority documents shall govern. No such duplication of WORK, conflict, or discrepancy is intended by the CONTRACT DOCUMENTS, and any duplication specified shall not become a basis for claim by the CONTRACTOR for extra cost to the OWNER.

e. Where compliance with two (2) or more industry standards or sets of requirements is indicated, and overlapping of those different standards or requirements established two (2) different or conflicting minimums or levels of quality, or quantity, the most stringent requirement (which is generally recognized to be also the most costly) is intended and will be enforced, unless specifically detailed language written into the CONTRACT DOCUMENTS (not by way of reference to an industry standard) clearly indicated that the less stringent requirement is to be fulfilled. Refer apparently-equal-but-different requirements, and uncertainties as to which levels of quality or quantity is the more stringent, to the ENGINEER for a decision before proceeding.

f. Notwithstanding any other provisions hereunder, all as-built drawings, plans, reports, documents, or other materials provided by the OWNER are for convenience only. The OWNER does not warrant or promise that they are correct. The CONTRACTOR must conduct his own investigation of the field conditions and shall not rely on any drawings, plans, report, documents, or other materials provided by the OWNER.

5. SHOP DRAWINGS:

   a. The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for prosecution of the WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWINGS shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS and shall not constitute a waiver by the OWNER of the OWNER'S right to enforce the CONTRACT DOCUMENTS. A CHANGE ORDER shall evidence the approval of any SHOP DRAWING, which substantially deviates from the requirements of the CONTRACT DOCUMENTS.

   b. When submitted for review by the ENGINEER, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that they have reviewed, checked and approved the SHOP DRAWINGS; and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.

   c. Portions of the WORK requiring SHOP DRAWING or sample submission shall not begin until the ENGINEER has approved the SHOP DRAWING or submission. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site(s) and shall be available to the ENGINEER.

   d. The CONTRACTOR shall submit to the ENGINEER, before any shop work is commenced, four (4) to seven (7) prints (four (4) prints are to be used by the ENGINEER and up to three (3) prints are to be used by the CONTRACTOR) of SHOP DRAWINGS for all items so stated in the SPECIFICATIONS as requiring SHOP DRAWINGS. Additional prints for regulatory agencies shall be submitted when indicated in the SPECIFICATIONS. Standard forms for processing SHOP DRAWINGS shall be used by the CONTRACTOR and furnished to the CONTRACTOR, by the ENGINEER.

      (1) No SHOP DRAWINGS shall be submitted directly by SUBCONTRACTORS or suppliers. All SHOP DRAWINGS shall be submitted through the CONTRACTOR who shall check and verify all field dimensions, check for compliance with the CONTRACT DOCUMENTS, stamp and endorse all SHOP DRAWINGS to indicate its approval and compliance with the above, and assign a transmittal number to each submission. Numbers shall be assigned in sequence. In the event that a SHOP DRAWING is returned marked "Amend and Resubmit" or "Rejected", subsequent resubmittals for the same item shall retain the same transmittal number, but shall have an alphabetical suffix (3a, 3b, etc.). At the time of each submission, the CONTRACTOR shall, in writing, call the attention of the ENGINEER to any deviations of the CONTRACT DOCUMENTS.

      (2) No portion of the WORK requiring a SHOP DRAWING shall be commenced until the SHOP DRAWING has been reviewed by the ENGINEER. If the first submittal of the SHOP DRAWING is marked either "No Exceptions Taken" or "Make Corrections Noted", up to three (3) prints shall be returned to the CONTRACTOR and fabrication of the item may begin. If the SHOP DRAWINGS are marked "Amend & Resubmit" or "Rejects – See Remarks", up to two (2) prints shall be returned to the

CONTRACTOR with notations thereon of corrections required. The CONTRACTOR shall cause the necessary corrections to be made and shall resubmit four (4) to seven (7) prints (four (4) prints for the ENGINEER and up to three (3) prints for the CONTRACTOR) with transmittal numbers and letters as defined above. If subsequent resubmittals are still not acceptable, resubmittals shall be made under the procedure outlined above until final acceptance is received.

(3) The ENGINEER will review SHOP DRAWINGS with reasonable promptness, but its review shall be only for conformance with the design concept of the PROJECT and for compliance with the information given in the CONTRACT DOCUMENTS. The acceptance of the separate item as such will not indicate acceptance of the assembly in which the item functions. The CONTRACTOR shall make any corrections required by the ENGINEER and shall return the required number of corrected copies. The CONTRACTOR shall direct specific attention in writing or on resubmitted SHOP DRAWINGS to revisions other than the corrections called for by the ENGINEER on previous submissions.

(4) The review by the ENGINEER of SHOP DRAWINGS shall not relieve the CONTRACTOR from its responsibility for strict adherence to the CONTRACT DOCUMENTS and the CONTRACTOR shall be solely responsible for any deviations from the requirements of the CONTRACT DOCUMENTS unless the CONTRACTOR has in writing called the attention of the ENGINEER to such deviations at the time of submission and the ENGINEER has given written acceptance to the specific deviation, nor shall any acceptance by the ENGINEER relieve the CONTRACTOR from responsibility for errors or omissions in the SHOP DRAWINGS. The final acceptance of SHOP DRAWINGS by the ENGINEER shall not operate to relieve the CONTRACTOR in any way of its responsibility under this CONTRACT for the satisfactory COMPLETION of the WORK, or for the accuracy of the dimensions, details, and quantities or for its CONTRACT. No change shall be made in the accepted SHOP DRAWINGS without written consent of the ENGINEER. The CONTRACT PRICE shall include the cost of furnishing all SHOP DRAWINGS and the CONTRACTOR shall be allowed no extra compensation therefor.

e. The CONTRACTOR shall submit to the ENGINEER for review, with such promptness as to expedite and not cause any delay in the WORK, all samples required by the CONTRACT DOCUMENTS. All samples shall be checked by and stamped with the approval of the CONTRACTOR, identified clearly as to material, manufacturer, any pertinent catalog numbers, the use for which intended, and the section number and paragraph of the SPECIFICATION wherein the material is specified. All samples shall be shipped post and/or freight paid.

(1) At the time of each submission, the CONTRACTOR shall in writing, call the attention of the ENGINEER to the deviations that the samples may have from the requirements of the CONTRACT DOCUMENTS.

(2) The ENGINEER will review with reasonable promptness submitted samples, but its review shall be only for conformance with the information given in the CONTRACT DOCUMENTS. The acceptance of a separate item as such will not indicate acceptance of the assembly in which the item functions. In the event samples are not accepted, the CONTRACTOR shall resubmit new samples until acceptance is obtained.

(3) No WORK requiring sample submission shall be commenced until the ENGINEER has accepted the submission.

(4) The acceptance of the ENGINEER of sample(s) shall not relieve the CONTRACTOR from its responsibility for any deviation from the requirements of the CONTRACT DOCUMENTS unless the CONTRACTOR has in writing called the attention of the ENGINEER to such deviations at the time of submission and the ENGINEER has given written acceptance of the specific deviations.

6. MATERIALS, SERVICES, AND FACILITIES:

a. It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all labor, materials, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the CONTRACT TIME.

b. Materials and equipment shall be so stored as to insure the preservation of its quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.

c. Manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer.

d. Materials, supplies, and equipment shall be in accordance with the samples submitted by the CONTRACTOR and approved by the ENGINEER.

e. Materials, supplies, or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sales contract or other agreement by which an interest is retained by the seller.

f. All materials are to be new, unused and the best and of finest quality of their several kinds. The CONTRACTOR shall provide facilities and handle all materials as required for the inspection by the ENGINEER. Materials which have not been accepted by the ENGINEER shall be removed from the site(s) of the WORK together with all surplus earth and materials which are unsuitable or not in conformity with the CONTRACT DOCUMENTS. Transportation and disposal of materials shall be without expense to the OWNER unless provided for in the Contract Documents. The CONTRACTOR shall promptly replace any materials rejected or condemned, and shall not be allowed extra time for COMPLETION of the WORK by reason of such rejection.

7. INSPECTION AND TESTING:

   a. All materials and equipment in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.

   b. The OWNER shall provide all inspection and testing services not expressly required by the CONTRACT DOCUMENTS.

   c. The CONTRACTOR shall provide, at its sole expense, the testing and inspection services required by the CONTRACT DOCUMENTS and shall furnish all results and findings to the ENGINEER.

   d. If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR shall give the ENGINEER timely notice of readiness. The CONTRACTOR shall then furnish the ENGINEER with required certificates of inspection, testing, or approval.

   e. Inspections, tests, or approvals by the ENGINEER or others shall not relieve the CONTRACTOR from the obligation to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS. Should inspections or tests reveal defective WORK, the defective WORK shall be made good and unsuitable materials shall be rejected, notwithstanding that such WORK and materials have been previously overlooked and accepted or estimated for payment. If the WORK or any part thereof shall be found defective at any time before the final acceptance of the whole WORK, the CONTRACTOR shall forthwith make good such defect in a manner satisfactory to the ENGINEER. Nothing in this CONTRACT shall be construed as vesting in the CONTRACTOR any right or property in the materials used after they have been attached or affixed to the WORK or the soil, but all such materials shall, upon being so attached or affixed, become the property of the OWNER.

   f. All portions of the WORK determined by the ENGINEER as failing to conform to the CONTRACT DOCUMENTS shall be taken down and removed and the CONTRACTOR shall promptly replace and re-execute the same in accordance therewith and without expense to the OWNER, and bear the expense of making good all WORK or property of other Contractors or of the OWNER destroyed or damaged by such removal or replacement.

   g. The ENGINEER and its representatives will at all times have access to the WORK. In addition, authorized representatives, and agents of any participating federal or STATE agency shall be permitted to inspect all WORK, materials, payroll, records of personnel, invoices of materials, and other relevant data and records. The CONTRACTOR shall provide proper facilities for such access and observation of the WORK, and for any inspection or testing thereof.

h. If any WORK is covered contrary to the written instructions of the ENGINEER, it must, if requested by the ENGINEER, be uncovered for their observation and replaced at the CONTRACTOR'S expense.

i. If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the request of the ENGINEER, will uncover, expose, or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such WORK is defective, the CONTRACTOR shall bear all expenses of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction. If, however, such WORK is found not to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributed to such uncovering, exposure, observation, inspection, testing, and reconstruction and an appropriate CHANGE ORDER shall be issued.

8. SUBSTITUTIONS:

a. Whenever a material, article, or piece of equipment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalog number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality and function shall be considered. Whenever it is written that an equipment manufacturer must have a specified period of experience with his products, equipment which does not meet the experience period can be considered if the equipment supplier or manufacturer is willing to provide a bond or cash deposit for the duration of the specified time period which will guarantee replacement of that equipment in the event of failure.

b. The CONTRACTOR may recommend the substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to brand name or catalog number, and if, in the opinion of the ENGINEER, such material, article or piece of equipment is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS shall be appropriately modified by CHANGE ORDER. The CONTRACTOR warrants that if substitutes are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitution will be made by the CONTRACTOR without a change in CONTRACT PRICE or CONTRACT TIME.

9. PATENTS:

The CONTRACTOR shall pay all applicable royalties and license fees. The CONTRACTOR shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss on account thereof, except that the OWNER shall be responsible for any such loss when a particular process, design or the product of a particular manufacturer or

manufacturers is specified and such specification causes such loss. However, if the CONTRACTOR has reason to believe that the design, process, or the product specified is an infringement of a patent, the CONTRACTOR shall be responsible for such loss unless they promptly give such information to the ENGINEER.

10. SURVEYS, PERMITS, AND REGULATIONS:

a. The OWNER shall furnish whatever available information it has at its disposal for CONTRACTOR use. From the information provided by the OWNER, unless specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail field surveys necessary for construction such as field establishment and verification of benchmarks, field establishment of baseline layout, slope stakes, batter boards, stakes for pile locations, and other working points, lines, elevations and cut sheets. The CONTRACTOR shall employ, at its own expense, a competent surveyor, registered in the STATE wherein the WORK is to be done to perform such duties.

b. The CONTRACTOR shall carefully preserve benchmarks, reference points, and stakes and, in case of willful or careless destruction, shall be charged with the resulting expense, and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.

c. All permits, licenses, and agency approvals necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise specified. Easements for existing facilities shall be secured and paid for by the CONTRACTOR, unless otherwise specified. The CONTRACTOR shall be solely responsible for performing any necessary acts and providing any materials required in order to comply with any and all terms and conditions set forth in any permits and licenses. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, they shall promptly notify the ENGINEER in writing and any necessary changes shall be adjusted as provided in Article 14, CHANGES IN THE WORK.

11. PROTECTION OF WORK, PROPERTY, AND PERSONS:

a. The CONTRACTOR shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the WORK. The CONTRACTOR shall take all necessary precautions for the safety of, and shall provide necessary protection to prevent damage, injury or loss to all employees on the WORK, and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site(s), and other property at the site(s) or adjacent thereto, including trees, shrubs, lawns, walks, pavement, roadways, structures and utilities not designated for removal, relocation or replacement during the course of construction. The CONTRACTOR shall be responsible for and pay for all loss or damage to materials and property, whether such are incorporated in, or to be incorporated in the WORK. The CONTRACTOR shall also replace or restore to original condition man-made or natural improvements, or other things injured or interfered with by the CONTRACTOR in carrying

out the WORK. Adequate weather protection of all materials and structures of this PROJECT shall be the duty of the CONTRACTOR.

b. The CONTRACTOR shall comply with all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction. They shall erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. They shall notify Owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR shall remedy all damage, injury or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, any SUBCONTRACTOR, or anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, except damage or loss attributable to fault of the CONTRACT DOCUMENTS, or to acts or omissions of the OWNER or the ENGINEER, or anyone employed by either of them or anyone for whose acts either of them may be liable and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.

c. In emergencies affecting the safety of persons or the WORK or property at the site(s) or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury, or loss. The CONTRACTOR shall give the ENGINEER prompt written notice of any significant changes in the WORK or deviation from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall be issued covering the changes and deviations involved.

d. The CONTRACTOR shall conclusively presume to be acquainted with all existing conditions and to guarantee that all work, materials, and equipment shall, upon final COMPLETION of the WORK, be turned over to the OWNER in a complete and perfect condition. The CONTRACTOR shall be responsible for the proper care, maintenance, and protection of all work, materials, and equipment, until the entire PROJECT is completed, and all work, materials, and equipment are found in good condition and accepted by the OWNER.

12. HAZARDOUS MATERIAL:

a. If at any time during construction, the presence of unanticipated hazardous materials at or proximate to a construction site(s) is detected, the CONTRACTOR shall stop WORK in the affected area and perform the following immediately:

(1) Notify the OWNER and the ENGINEER in writing, within twenty-four (24) hours of the CONTRACTOR'S discovery of the presence of hazardous material(s), of the specific hazardous material(s) encountered and the precise location of the same. Failure to comply with this notice provision shall be deemed a waiver by the CONTRACTOR of any claim for an equitable adjustment of the CONTRACT PRICE or an extension of the CONTRACT TIME.

(2) Take all action necessary and appropriate for the protection and safety of the public and persons at or about the site(s), including posting danger signs and other warnings

against hazards, promulgating safety regulations, and notifying Owners and users of adjacent sites and utilities.

(3) Notify the respective STATE Department of Hazardous Waste (or other Department, Bureau, or the like for such jurisdiction) and receive instructions as to the appropriate measures to be taken while working in that area.

(4) Immediately notify the designated representative of the respective STATE Department of Energy and Environmental Protection for this PROJECT, or other appropriate STATE program director/administrator in writing following the discovery of the suspected hazardous materials.

(5) Notify the local hazardous waste coordinator.

b. Actions at the construction site(s) following completion of these steps shall be at the direction of the Division of Hazardous Waste (or other Department, Bureau, or the like for such jurisdiction). Nothing in this Article shall be construed to require the ENGINEER and/or the CONTRACTOR to perform WORK for which adequate compensation has not been contracted for other than to ensure that basic measures necessary to protect health and welfare of workers, residents and abutters are immediately adopted.

c. At construction site(s) where the presence of contaminated or hazardous materials are suspected to exist and provisions have been made in the CONTRACT DOCUMENTS for their management, the requirements of Paragraph 12a. of this Article shall apply.

13. SUPERVISION BY CONTRACTOR:

a. The CONTRACTOR shall supervise and direct the WORK. The CONTRACTOR shall be solely responsible for the means, methods, techniques, coordination, sequences, and procedures of construction. The CONTRACTOR shall employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR'S representative at the site(s). The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site(s) at all times as required to perform adequate supervision and coordination of the WORK.

b. The CONTRACTOR shall employ only competent, qualified, adequately trained workers and, whenever the ENGINEER shall notify the CONTRACTOR, in writing, that any person on the WORK is, in its opinion, incompetent, unfaithful, disorderly, or otherwise unsatisfactory or not employed in accordance with the provisions of this CONTRACT, such person shall be discharged from the WORK and shall not again be employed on it except with the consent of the ENGINEER.

14. CHANGES IN THE WORK:

a. The OWNER may at any time, as the need arises, order changes to the scope of the WORK without invalidating the CONTRACT. If such changes increase or decrease the amount

due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, a CHANGE ORDER shall authorize an equitable adjustment. The OWNER must confirm in writing any explanation or interpretation of DRAWINGS or SPECIFICATIONS altering or varying the WORK, made by an employee of the OWNER, before being acted upon by the CONTRACTOR. [Town Code: Chapter 8, Article I]

b. The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles the CONTRACTOR to a change in the CONTRACT PRICE or time, or both, in which the CONTRACTOR shall give the ENGINEER written notice thereof within seven (7) days after receipt of the ordered change. Thereafter, the CONTRACTOR shall document the basis of the change in CONTRACT PRICE or time within thirty (30) days. The CONTRACTOR shall not execute such changes pending receipt of an executed CHANGE ORDER or further instructions from the OWNER.

15. CHANGES IN CONTRACT PRICE:

a. The CONTRACT PRICE may be changed only by a written CHANGE ORDER executed by the OWNER and CONTRACTOR. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one (1) or more of the following methods in order of precedence listed below:

(1) Unit prices previously approved.

(2) An agreed lump sum.

(3) The actual cost of labor, direct overhead, materials, supplies, equipment and other services necessary to complete the WORK, computed as follows:

i. The reasonable cost of labor employed directly on the WORK at prevailing rates of wages.

ii. The cost of Worker's Compensation Insurance, Federal Social Security and STATE Unemployment Compensation on Item i. at established rates.

iii. The unreasonable cost of materials incorporated in the WORK.

iv. The reasonable cost at fair market rental rates for equipment employed directly on the WORK.

v. Ten (10) percent of Items i., ii., iii. and iv. for overhead, superintendence, and profit. On subsequent WORK, this ten (10) percent will be allowed only to the SUBCONTRACTOR.

vi. An additional five (5) percent of Items i., ii., iii. and iv. on WORK performed by a SUBCONTRACTOR of the CONTRACTOR. This five (5) percent includes overhead, superintendence, profit, and bonds.

b. The CONTRACTOR shall, at the request of the ENGINEER, furnish itemized statements of the cost of the WORK ordered and give the ENGINEER access to accounts, bills, and vouchers relating thereto. If the CONTRACTOR claims compensation for extra WORK not ordered as aforesaid, or for any damage sustained, it shall, upon or before the beginning of any such WORK or within one (1) week of the sustaining of any such damage, make a written statement of the nature of the WORK to be performed or the damage sustained, to the ENGINEER, and shall, on or before the 10th day of the month succeeding that in which any such extra WORK shall have been done or any such damage shall have been sustained, file with the ENGINEER an itemized statement of the details and amount of such work or damage; and unless such statements shall be made as so required, its claims for such compensation shall be forfeited and invalid, and it shall not be entitled to payment on account of any such WORK or damage.

16. TIME FOR COMPLETION AND LIQUIDATED DAMAGES:

a. The date of beginning and the time for SUBSTANTIAL COMPLETION and COMPLETION of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.

b. The CONTRACTOR shall proceed with the WORK at such rate of progress to ensure both SUBSTANTIAL COMPLETION and full COMPLETION within the CONTRACT TIME. It is expressively understood and agreed, by and between the CONTRACTOR and the OWNER, that the time allowed to achieve SUBSTANTIAL COMPLETION and the CONTRACT TIME for COMPLETION of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.

c. If the CONTRACTOR fails to achieve SUBSTANTIAL COMPLETION or COMPLETION within the specified time(s) or extension of time(s) expressively granted by the OWNER, then the CONTRACTOR shall pay to the OWNER the amount for liquidated damages as specified in the CONTRACT DOCUMENTS for each calendar day and/or working day that the CONTRACTOR shall be in material default after the time(s) stipulated.

d. The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in COMPLETION of the WORK is due to the following, if the CONTRACTOR has promptly given written notice of such delay to the OWNER or ENGINEER:

(1) To any preference, priority, or allocation order duly issued by the OWNER;

(2) To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God, or of the public enemy, acts of the OWNER, acts of another Contractor in the performance of a contract with the OWNER, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and

(3) To any delays of SUBCONTRACTORS occasioned by any of the causes specified in Paragraphs (1) and (2) of this Article.

17. CORRECTION OF WORK:

a. The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not, and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS, and without expense of the OWNER. The CONTRACTOR shall bear the expense of making good all WORK of other Contractors destroyed or damaged by such removal or replacement.

b. All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove and replace such rejected WORK within five (5) days after receipt of written notice, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

18. SUBSURFACE CONDITIONS:

a. The CONTRACTOR shall promptly, and before such conditions are disturbed or costs are incurred by the CONTRACTOR, except in the event of an emergency (defined as a condition posing an imminent risk to public health and safety), notify the OWNER and the ENGINEER by written notice of:

(1) Subsurface or latent physical conditions at the site(s) differing materially from those indicated in the CONTRACT DOCUMENTS; or

(2) Unknown physical conditions at the site(s), of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.

b. The OWNER and the ENGINEER shall promptly investigate the conditions, and if they find that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made, and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless the CONTRACTOR has given the required written notice within the state time period, provided that the OWNER may, if the CONTRACTOR determines the facts to justify, consider and adjust any such Claims asserted before the date of final payment.

19. SUSPENSION OF WORK, TERMINATION, AND DELAY:

a. The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety (90) days or such further time as agreed upon by the CONTRACTOR, by written notice to the CONTRACTOR and the ENGINEER which notices shall fix the date on which the WORK shall be resumed. The CONTRACTOR shall resume that WORK on

the date so fixed. The CONTRACTOR shall not be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

b. If the CONTRACTOR is adjusted bankrupt or insolvent, or if the CONTRACTOR makes a general assignment for the benefits of its creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of the CONTRACTOR'S property, or if the CONTRACTOR files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or applicable laws, or if the CONTRACTOR repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if the CONTRACTOR repeatedly fails to make prompt payments to SUBCONTRACTORS, or for labor, materials, or equipment, or if the CONTRACTOR disregards laws, ordinances, rules, regulations or orders of any public body having jurisdiction of the WORK, or if the CONTRACTOR disregards the authority of the ENGINEER, or if the CONTRACTOR otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and its Surety a minimum of ten (10) days from delivery of a written notice, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, tools, equipment, construction equipment and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method it may deem expedient. In such case, the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess shall be paid to the CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR shall pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.

c. Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due to the CONTRACTOR shall not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.

d. After ten (10) days from delivery of a written notice to the CONTRACTOR and the ENGINEER, the OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the CONTRACT. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit for work completed up to the time of such termination, but in no event shall the OWNER be liable for any other costs, expenses or damages, and the CONTRACTOR shall not be entitled to compensation for any overhead or profit on WORK not performed.

e. If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days

after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER, or awarded by arbitrators within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a written notice to the OWNER and the ENGINEER, terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition, and in lieu of terminating the CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon ten (10) days written notice to the OWNER and the ENGINEER stop the WORK until the CONTRACTOR has been paid all amounts then due, in which event and upon resumption of WORK, CHANGE ORDERS shall be issued extending the CONTRACT PRICE or CONTRACT TIME, or both, to compensate for the costs and delays attributable to the stoppage of the WORK.

f. If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or the ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE and extension of the CONTRACT TIME, or both, shall be made by a CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily cause by the failure of the OWNER or the ENGINEER.

g. Notwithstanding any other provisions hereunder, the OWNER may cancel the Agreement, suspend WORK and terminate the CONTRACT for the convenience of the OWNER in the event that the CONTRACT PRICE increases by fifteen (15) percent or more.

20. PAYMENTS TO CONTRACTOR:

a. At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR shall submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site(s), the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material and equipment and protect its interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing its approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing its reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make necessary corrections and resubmit the partial payment estimate. The OWNER will, as soon as practicable following an approved partial payment estimate, pay the CONTRACTOR a progress pavement on the basis of an approved partial payment estimate. The OWNER shall retain five (5) percent of the amount of each payment until final COMPLETION and acceptance of all WORK covered by the CONTRACT DOCUMENTS. When the WORK is substantially complete (operational or beneficial

occupancy), the retained amount may be further reduced below five (5) percent to only that amount necessary to assure COMPLETION. On COMPLETION and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages, less authorized deductions upon CONTRACTOR'S satisfaction of all contractual conditions precedent to final payment.

b. Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

c. The OWNER shall have the right to enter the premises for the purpose of doing WORK not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

d. The CONTRACTOR shall indemnify and save the OWNER and the OWNER'S agents harmless from all claims growing out of the lawful demands of SUBCONTRACTORS, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of WORK. The CONTRACTOR and any other parties shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designed above have been paid, discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been discharged whereupon payment to the CONTRACTOR shall be resumed, in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose obligations upon the OWNER to either the CONTRACTOR, its surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.

e. Upon COMPLETION and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted by it under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due to the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of COMPLETION and acceptance of the WORK.

f. If the OWNER fails to make payment within thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be

added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

21. ACCEPTANCE OF FINAL PAYMENT AS RELEASE:
The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically accepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and other relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or its sureties from any obligations under the CONTRACT DOCUMENTS or the Performance Bond and Payment Bond or Maintenance Bond.

22. INSURANCE:

a. The CONTRACTOR shall purchase and maintain such Insurance as will protect the OWNER and/or the ENGINEER from claims set forth below which may arise out of or result from the CONTRACTOR'S execution of the WORK, whether such execution be by themselves or by any SUBCONTRACTOR, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

(1) Claims under Workman's Compensation, disability benefit, and other similar employee benefit acts;

(2) Claims for damages because of bodily injury, occupational sickness or disease, or death of its employees;

(3) Claims for damages because of bodily injury, sickness or disease, or death of any persons other than its employees;

(4) Claims for damages insured by usual personal injury liability coverage which are sustained (a) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (b) by any other person; and

(5) Claims for damages because of injury, damage to, or destruction of tangible property, including loss of use resulting therefrom.

b. Certificates of Insurance acceptable to the OWNER shall be filled with the OWNER prior to commencement of the WORK. These certificates shall contain a provision that coverages afforded under the policies will not be canceled or a restrictive amendment added, unless at least thirty (30) days prior written notice has been given to the OWNER. The certificates shall name the types of policy provided, specifically state the title of this CONTRACT and state that the Insurance coverage is required by the General Conditions and that the same are "primary" and "non-contributory".

c. The CONTRACTOR shall procure and maintain, at its own expense, during the CONTRACT TIME, liability Insurance as hereinafter specified:

(1) General Public Liability including Contractor's Liability as applicable to the CONTRACTOR'S obligations. Completed operations and Products Liability: all on the occurrence basis with Personal Injury coverage and Broad Form Property Damage. Products and Completed Operations shall be maintained for up to three (3) years after the COMPLETION of the PROJECT.

General Liability	**Minimum Requirements**
Fire Damage	100,000
Medical Expenses	10,000
Products-Completed Ops. Aggregate	2,000,000
Automobile Liability	
Combined Single Limit	1,000,000
Workers' Compensation	
Each Accident	Statutory Limits
Disease Each Employee	100,000
Disease Policy Limit	500,000
Excess Liability/Umbrella	
Each Occurrence	5,000,000
Aggregate	5,000,000

Personal Injury and Accidental Death – General Liability
Each person/aggregate $1,000,000

Property Damage – General Liability
Each occurrence/aggregate $10,000,000

Personal Injury – Automobile Liability
Each person/occurrence $1,000,000

Property Damage – Automobile Liability
Each occurrence/aggregate $1,000,000

(2) The CONTRACTOR'S Public Liability Insurance shall provide, by any necessary removal of exclusions or by separate policies of the same limits, coverage for all hazards inherent in the WORK of this PROJECT. Without limiting the foregoing statement, the Insurance shall cover the following hazards: Explosion, collapse, and underground damage; damage to property in the CONTRACTOR'S care, custody, or control; rigging, hoisting, and moving; and water damage, including without limitation water damage to privately owned property.

(3) The CONTRACTOR shall acquire and maintain Fire and Extended Coverage Insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S Surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.

d. The CONTRACTOR shall procure and maintain, at its own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the STATE in which the WORK is performed, workmen's compensation Insurance and employer's liability Insurance, including occupational disease provisions for all of its employees at the site(s) of the PROJECT and in case any WORK is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly provide Workmen's Compensation Insurance and Employer's Liability Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous WORK under this CONTRACT at the site(s) of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide adequate and suitable Insurance for the protection of its employees not otherwise protected. The limit of Employer's Liability Insurance shall not be less than $1,000,000 each accident, or shall meet the limits as required by the STATE, whichever limit is higher.

e. The CONTRACTOR shall secure, "Special Form" type Builders Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such Insurance shall not be less than the full insurable value (completed) of the portion of the project under construction. It should include "All Risk" insurance for physical loss or damage including theft. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, water, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. All policies in this CONTRACT shall name as the insured the CONTRACTOR, the ENGINEER, and the OWNER.

f. The CONTRACTOR shall secure and maintain Owner's Protective Liability Insurance coverage naming the OWNER and the ENGINEER as insured with the same limits and coverages as the CONTRACTOR'S General Public Liability, Property Damage Insurance. This Insurance shall be in addition to the other required coverages, but shall not duplicate such coverage therein provided.

g. The CONTRACTOR shall secure and maintain Umbrella or Excess Liability Insurance in the amount of not less than $5,000,000 (Five Million) over and above primary limits required to be carried out.

h. The CONTRACTOR shall secure and maintain Property Coverage for materials and supplies being transported by the CONTRACTOR.

i. Insurance referred to shall be written for not less than any limits of liability required by Law, or those set forth above, whichever is greater.

j. The OWNER reserves the right to require additional Insurance coverages or higher limits, or both provided the OWNER will pay additional premium therefore.

23. CONTRACT SECURITY:

The CONTRACTOR shall, within ten (10) days after receipt of the NOTICE OF AWARD, furnish the OWNER with a Performance Bond and Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions, and agreements of the CONTRACT DOCUMENTS, and upon prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such bonds shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the STATE in which the WORK is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds", as published in the Treasury Department Circular Number 570. The expense of these bonds shall be borne by the CONTRACTOR. In the event any agency or department of the State of Connecticut, including but not limited to the State Department of Transportation, or of the Federal Government, shall require a bond for any part of the work, the CONTRACTOR shall be responsible of the expense of said bonds. If at any time a surety on any such bonds is declared bankrupt or loses its right to do business in the STATE in which the WORK is to be performed or is removed from the list of Surety Companies Acceptable on Federal Bonds, the CONTRACTOR shall, within ten (10) days after notice from the OWNER to do so, substitute an acceptable bond(s) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such bond(s) shall be paid by the CONTRACTOR. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable bond(s) to the OWNER. The Payment Bond shall comply with Connecticut General Statutes 49-41 *et seq.* and the Performance Bond shall be in a form acceptable to the OWNER. The OWNER shall have the authority to request that the bond amounts be adjusted to reflect the additional costs of the PROJECT due to any increase in value of the CONTRACT.

24. ASSIGNMENTS:

Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign, or otherwise dispose of the CONTRACT or any portion thereof, or of its right, title, or interest therein, or its obligations thereunder, without written consent of the other party.

25. INDEMNIFICATION:

a. The CONTRACTOR shall indemnify, defend and hold harmless the OWNER and the ENGINEER and its agents and employees from and against all claims, damages, losses, and expenses, including attorney's fees, arising out of or resulting from the performance of the WORK.

b. In any and all claims against the OWNER or the ENGINEER, or any of its agents or employees by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the Indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under Workmen's Compensation Acts, Disability Benefits Acts, or other employee benefit acts.

c. The obligation of the CONTRACTOR under this Article shall not extend to the liability of the ENGINEER, its agents or employees, arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs or SPECIFICATIONS.

d. The CONTRACTOR shall indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demands of SUBCONTRACTORS, laborers, workmen, mechanics, materialmen, and furnisher of machinery and parts thereof, equipment tools, and all supplies, incurred in the furtherance of the performance of the WORK.

26. SEPARATE CONTRACTS:

a. The OWNER reserves the right to let other contracts in connection with this PROJECT or separate from this PROJECT at the site. The CONTRACTOR shall afford other Contractors reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall promptly connect and coordinate WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other Contractor, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.

b. The OWNER may perform additional WORK related to the PROJECT or let other contracts containing provisions similar to these. The CONTRACTOR shall afford the other Contractors who are parties to such contracts (or the OWNER, if performing the additional WORK themselves) reasonable opportunity for the introduction and storage of materials and equipment, and the execution of WORK, and shall properly connect and coordinate WORK with theirs.

c. If the performance of additional WORK by other Contractors or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or other involves the CONTRACTOR in additional expense or entitles the CONTRACTOR to an extension of the CONTRACT TIME, the CONTRACTOR may make a Claim therefor as provided in Article 14 and 15.

d. The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of sole responsibility for the care and protection of the

WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.

27. SUBCONTRACTING:

a. The CONTRACTOR may utilize the services of specialty SUBCONTRACTORS on those parts of the WORK, which, under normal contracting practices, are performed, by specialty SUBCONTRACTORS. Such subcontracting shall not relieve the CONTRACTOR of responsibility for completing such work.

b. The CONTRACTOR shall not award WORK to SUBCONTRACTOR(S) in excess of fifty (50) percent of the CONTRACT PRICE without prior written approval of the OWNER.

c. The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of its SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as they are for the acts and omissions of persons directly employed by them.

d. The CONTRACTOR shall cause appropriate provisions to be inserted in all Subcontracts relative to the WORK to bind SUBCONTRACTORS to the CONTRACTOR by the terms of the CONTRACT DOCUMENTS insofar as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any Subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.

e. Nothing contained in this CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER. Contracts written between the CONTRACTOR and his SUBCONTRACTORS shall include language specifically disclaiming that there are any intended third-party beneficiaries.

f. The CONTRACTOR shall not execute an agreement with any SUBCONTRACTOR or permit any SUBCONTRACTOR to perform any WORK included in this CONTRACT before submitting and receiving written approval of such SUBCONTRACTOR from the OWNER. No proposed SUBCONTRACTOR shall be disapproved by the OWNER except for cause, which may include but not be limited to ongoing contract disputes and/or litigation between the OWNER and the proposed SUBCONTRACTOR.

28. AUTHORITY OF THE ENGINEER:

a. The ENGINEER shall act as the OWNER'S representative during the construction period. The ENGINEER shall decide questions, which may arise as to quality and acceptability of materials furnished and WORK performed. The ENGINEER shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site(s) and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.

b. The CONTRACTOR shall be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.

c. The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety, all of which are the CONTRACTOR'S sole responsibility.

d. The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

29. GUARANTEE:

a. The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the system that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections at its own expense as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period and CONTRACTOR'S surety expressly agrees to this provision by issuing the Performance Bond.

b. The CONTRACTOR shall reimburse the OWNER for expenses due to additional work performed by the ENGINEER and its consultants for construction representation and administration related to the correction of defects or damage performed under guarantee.

30. CLAIMS AND DISPUTES:

a. All claims, disputes, and other matters in question arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof, except for claims that have been waived by the making and acceptance of final payment as provided by Article 21or waived pursuant to the CONTRACTOR'S failure to comply with express conditions precedent to submitting a claim, may be settled first by non-binding mediation through a mediation where mutually agreed to by the parties. Any dispute not resolved by mediation shall be subject to litigation in Connecticut Superior Court. The OWNER, in its sole discretion, may opt to litigate specific disputes.

b. The CONTRACTOR shall carry on the WORK and maintain the progress schedule during any disputes and other matters in questions arising out of, or relating to, the CONTRACT DOCUMENTS or the breach thereof, unless otherwise mutually agreed in writing.

31. TAXES:

The CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required by the law of the place where the WORK is performed. Town of Stratford is exempt from State Sales Tax under State General Statues Chapter 219-Section 12-412 Subsection A.

32. INTERPRETATION OF DRAWINGS AND SPECIFICATIONS:

The SPECIFICATIONS and the DRAWINGS are intended to describe and provide for a completed PROJECT. They are intended to be complementary, and what is called for by either shall be complete in every detail, notwithstanding that every item necessarily involved is not particularly mentioned, and the CONTRACTOR shall provide all labor and materials necessary for the entire COMPLETION of the WORK intended to be described.

33. SITE REGULATIONS:

a. Removal of Rubbish and Temporary Facilities: The CONTRACTOR shall within forty-eight (48) hours or as directed during the progress of WORK, remove and legally dispose of all surplus material and debris, and keep the job site and the project area in a clean and neat condition.

b. Tobacco, Drugs and Liquor Prohibited: The CONTRACTOR shall neither permit nor suffer smoking where it creates a hazard nor the introduction or use of drugs, spirituous or intoxicating liquors upon or about the WORK embraced in this CONTRACT or upon any of the ground occupied by the CONTRACTOR.

c. Posters: The CONTRACTOR shall not permit or suffer any placards, posters, or advertisements to be displayed on or about the premises unless approved by the OWNER.

34. LIMITATIONS OF DATA PRESENTED:

a. DRAWINGS, surveys, measurements, dimensions, calculations, estimates, borings, and statements as to the condition under which the WORK is to be performed are believed to be correct.

b. The BIDDER shall carefully examine the CONTRACT DOCUMENTS, including all DRAWINGS, SPECIFICATIONS, and ADDENDA, shall visit the site(s), and shall satisfy themselves as to the type and quantity of the WORK to be done. For the purposes of comparing several proposals, the BID shall be based on the data presented and the BIDDER'S examination of the site(s).

c. The locations of all utilities are obtained from the best available sources, and are to be considered as approximate insofar as size, location, and elevation are concerned. Furthermore, it is expressly understood that there may be utilities in existence other than those shown on the DRAWINGS.

35. HEALTH AND SAFETY EQUIPMENT:

a. As provided for Article 11, the CONTRACTOR is responsible for establishing and maintaining a Health and Safety program throughout the course of the PROJECT so as to meet all local, STATE, Federal, and OSHA requirements.

b. In order for the OWNER and/or ENGINEER to observe the WORK, the CONTRACTOR shall provide health and safety equipment for such purposes. Such equipment shall specifically include but not necessarily be limited thereto the following:

(1) Earplugs in sufficient quantities

(2) Headset protective hearing devices

(3) Safety glasses/goggles

(4) Hard hats

(5) High visible vests

c. All of the above equipment shall be continuously provided at the worksite(s) and maintained in good working order. It is understood that such equipment shall remain the property of the CONTRACTOR and is in addition to any and all health and safety equipment that the CONTRACTOR is required to have for the CONTRACTOR'S health and safety program on-site.

36. REVIEW OF WORK:

The OWNER, its authorized representatives and agents, shall at all times have access to and be permitted to observe, inspect, and review all WORK, materials, equipment, payrolls, personnel records, employment conditions, material invoices, and other relevant data and records pertaining to this CONTRACT, provided, however, that all instructions and approval with respect to the WORK will be given to the CONTRACTOR only by the OWNER through its authorized representatives or agents.

37. FINAL INSPECTION:

When the WORK covered by this CONTRACT is substantially completed, the CONTRACTOR shall notify the OWNER in writing that the WORK will be ready for final inspection on a definite data, which shall be stated in the notice. The notice will be given at least three (3) days prior to the date stated for final inspection and bear the signed concurrence of the representative of the OWNER having charge of inspection. If the OWNER determines that the status of the WORK is as represented, it will make the arrangements necessary to have final inspection commenced on the date stated in the notice, or as soon thereafter as practicable.

END OF SECTION

1. Application
2. Specifications and Drawings
3. Progress of Work and Schedule Requirements
4. Traffic Control
5. Change in the Amount of Work
6. Sequence of Construction
7. Visit to the Site
8. Disposal of Excess and Unsuitable Soil Materials
9. Site Maintenance, Disposal of Debris, and Dust Control
10. Technical Specifications
11. Utility Notification and Protection
12. Cleanup
13. Special Inspections
14. Work Area
15. Lines, Grades, and Measurements
16. Dimensions of Existing Structures
17. Work to Conform
18. Pipe and Structure Locations
19. Computation of Quantities
20. Emergency Vehicles and School Buses
21. Permits
22. Storage of Materials
23. Interference with Existing Works
24. Photographs and Videos
25. Hydraulic Uplift of Structures
26. Disturbance of Bounds
27. Maintenance and Protection of Traffic

1. APPLICATION:

   A. The Special Requirements under these specifications are applicable to all work performed under this Contract.

2. SPECIFICATIONS AND DRAWINGS:

   A. All work shall conform to these specifications and the accompanying contract drawings, together with any changes or directions that may be furnished from time to time by the Engineer in the manner proscribed by the Contract Documents.

3. PROGRESS OF WORK AND SCHEDULE REQUIREMENTS:

   A. The Contractor shall promptly start and continue actual construction work under this Contract with the necessary staff and equipment to properly execute and complete this Contract in the specified time. No cessation of the Contractor's operations will be allowed without the approval of the Engineer. The rate of progress shall be satisfactory to the Owner and the Engineer. The Contractor shall furnish to the Engineer a progress schedule for the work.

   B. The Contractor shall commence and complete the work required by the Contract Documents in strict accordance with the dates outlined below, unless otherwise directed:

(See Next Page)

Project Site	Start Date	Complete By Date
Water Pollution Control Facility 105 Beacon Point Road Stratford, CT 06615	TBD	Dec 15, 2027

4. TRAFFIC CONTROL:

   A. The Contractor shall contact the responsible heads of the Fire, Police, and other appropriate governing bodies of the municipality and/or state in order to obtain necessary permits and determine the requirements for said departments with respect to traffic control during construction.

   B. When detours or alternate routes are permitted by the governing body, the size, construction, and location of signs shall conform to local and state requirements and/or standards. The Contractor shall coordinate with the Police and Fire Departments and the Engineer during the establishment of alternate route(s), and it shall be the Contractor's responsibility to prepare an acceptable 'Detour Plan' for submittal to the local traffic authority and the Engineer for approval prior to formal notification of the respective Town of Stratford agencies. Detour routes shall be adequately posted to assist the motorist to return to their route of travel. Where the roadway under construction is the only means of vehicular access to a particular area determined by the appropriate governing body, the Contractor shall provide continual access to the area for residents and emergency vehicles.

   C. For control of moderate traffic, the Contractor shall provide an adequate number of flag persons employed at the expense of the contractor.

   D. When directed by the Owner, uniformed officers will be required to act as traffic control personnel in construction areas.

   E. The employment or presence of traffic flag persons, special officers, or police shall in no way relieve the Contractor of any responsibility or liability that is otherwise the Contractor's under the terms of the Contract.

5. CHANGE IN THE AMOUNT OF WORK:

   A. The Owner reserves the right to increase or decrease the amount of the work as may be found desirable or necessary during the execution of this Contract, in accordance with the specifications, and the unit prices quoted in the bid proposal shall apply without change to such variation in the quantity of the items.

6. SEQUENCE OF CONSTRUCTION:

   A. For the protection of life and property, all backfill operations shall follow closely behind excavations when possible. The Contractor shall ensure that no excavation be left open, unguarded, or water filled during any period of time when work is not actually in progress. It is the purpose and intent that all excavations and backfill, including consolidation operations and temporary surfacing within an area be accomplished expeditiously before proceeding to other work areas.

   B. The Engineer reserves the right to schedule the Contractor to construct at any locations within the project area. At the same time the Engineer may schedule the suspension of construction at any location.

   C. All sewer construction should begin at the downstream ends of the proposed sewers in order that any pipe in place can be tested and utilized. If the Engineer waives the provision at any time, he reserves the right to order construction in any areas that have been bypassed at any time at no additional cost to the Owner.

   D. All pipe and structure installation and backfilling operations in any street shall be completed before beginning work in any other street or right-of-way.

7. VISIT TO THE SITE:

   A. Before submitting a bid, the Bidder shall visit the site, examine the existing conditions, and thoroughly acquaint himself with the conditions before performing the work.

   B. The Bidder shall also study available as-built, utility, and other data and compare it with the information gathered during their site examination, as no extra compensation will be authorized for extra work caused by their unfamiliarity with the site or the conditions particular to this job.

8. DISPOSAL OF EXCESS AND UNSUITABLE SOIL MATERIALS:

   A. All surplus and unsuitable soil materials removed from the excavations shall become the property of the Contractor, unless called for otherwise in the specifications, and shall be removed from the site and disposed of off-site by the Contractor in accordance with all applicable laws and regulations.

9. SITE MAINTENANCE, DISPOSAL OF DEBRIS, AND DUST CONTROL:

   A. During the prosecution of work, the Contractor shall maintain the site of his operations and adjoining areas in a neat and orderly manner, and shall not allow the accumulation of construction debris or surplus excavation materials within the right-of-way or adjoining pavement areas.

   B. The Contractor shall be responsible for controlling dust from his operations, and when ordered by the Engineer, shall use whatever means necessary for dust control, including the use of manual and powered sweeping, and the sprinkling of water, in a manner satisfactory to the Engineer, and at no additional cost.

   C. Should the Contractor neglect or refuse to maintain the site free of accumulated debris, and provide dust control, the Owner reserves the right to have the service performed by others and the cost thereof deducted from progress payments.

10. TECHNICAL SPECIFICATIONS:

   A. All technical specifications referred to herein these specifications, such as AWWA, ASTM, AASHTO, and others, refer to the latest revision of such technical specifications.

11. UTILITY NOTIFICATION AND PROTECTION:

   A. The Contractor shall give written notice, in accordance with Chapter 353 of the Public Acts of 1983, to all utilities at least seventy-two (72) hours, exclusive of Saturdays, Sundays, and legal holidays, before excavation and/or blasting operations.

   B. In addition to protecting pipes, mains, conduits, and other utilities in use, excavations and all other work shall be performed in such a manner as to avoid damage to poles and other utility structures and appurtenances.

   C. Reasonable precautions, to include temporary support of the affected utility, shall be taken as necessary to avoid damage. Immediate notifications shall be given to the utility when damage occurs. The Contractor shall be liable for all damage caused by its activities hereunder, including but not limited to excavating and/or blasting activities.

12. CLEANUP:

   A. At the conclusion of the work, the Contractor shall remove and haul away all remaining surplus excavation, broken pavement, lumber, equipment, temporary structures, and any other refuse remaining within the project limits from the construction operations, and shall leave the entire site of the work in a neat and orderly condition.

   B. Work areas which are placed into operation prior to full project completion to facilitate the Contractor’s work shall be given a thorough cleaning by the Contractor prior to final project acceptance.

13. SPECIAL INSPECTIONS:

A. Special inspections are not part of the Contractor's scope of work. The Owner shall pay the cost for such special inspections and testing by a lab. When required, the Contractor shall coordinate his work with the selected Special Inspector to ensure that inspection of the work is completed in a timely manner. The Contractor shall pay for re-inspection or re-testing required as a result of non-compliance with the Contract Documents.

14. WORK AREA:

A. The Contractor shall confine his on-site operations to within the designated work area(s), unless specifically authorized by the Owner to work outside of the work area.

15. LINES, GRADES, AND MEASUREMENTS:

A. The Contractor shall employ, at its own cost, a competent land surveyor licensed in the State of Connecticut. The Contractor shall require said surveyor to establish all lines, elevations, reference marks, batter boards, and any other items needed by the Contractor during the progress of the work, and from time to time to verify such marks by instrument or other appropriate means.

B. The Contractor shall make, check, and be responsible for all measurements and dimensions necessary for the proper construction of and the prevention of errors in the work.

16. DIMENSIONS OF EXISTING STRUCTURES:

A. Where the dimensions and locations of existing structures are of importance in the installation or connection of any part of the work, the Contractor shall verify such dimensions and locations in the field before the fabrication of any material or equipment that is dependent on the correctness and accuracy of such information.

17. WORK TO CONFORM:

A. During its progress and on its completion, the work shall conform truly to the lines, levels, and grades indicated on the drawings, or given by the Engineer, and shall be built in a thoroughly substantial and workmanlike manner, in strict accordance with the drawings, specifications, and other Contract Documents and the directions given from time to time by the Engineer.

B. All work performed without instructions having been given by the Engineer, without proper lines or levels, or performed during the absence of the Engineer, will not be estimated or paid for except when such work is authorized by the Engineer in writing. Work so done may be ordered to be uncovered or taken down, removed, and replaced at the Contractor's expense.

18. PIPE AND STRUCTURE LOCATION:

A. Pipes and structures shall be located substantially as indicated on the drawings, but the right is reserved to the Owner, acting through the Engineer, to make such modifications in location as may be found desirable to avoid interference with existing structures, or for other such reasons.

B. Where fittings and any other items are noted on the drawings, such notations are for the Contractor's convenience and shall not relieve him from laying and jointing differently, or providing additional items where required.

19. COMPUTATIONS:

A. For estimating quantities in which the computation of areas by geometric methods would be comparatively laborious, it is agreed that the use of a planimeter shall be considered an instrument of precision adapted to the measurement of such areas.

B. It is further agreed that the computation of earthwork volumes shall be performed using the method of average end areas.

20. EMERGENCY VEHICLES AND SCHOOL BUSES:

A. Provisions shall be made for the safe passage of emergency vehicles and school buses at all times.

21. PERMITS:

A. The Contractor shall conduct his operations in such a manner so as to conform to all requirements set forth in the required or obtained permits, licenses and/or other authorizations. If the Contractor's method of operations deviates from those indicated in the permits, licenses and/or other authorizations, the Contractor shall be responsible for all the necessary additional permits required to complete the work. Such permit revisions and delays shall be at the Contractor's own expense and will not be grounds for extension of time to complete the work. The Contractor will be responsible for obtaining or verifying applicable permits required for the work.

22. STORAGE OF MATERIALS:

A. No stockpiling of excavated materials will be allowed within a Town or State right-of-way, except under those circumstances where prior approval is provided by the Owner and Engineer.

B. All surplus and unsuitable material shall be removed or disposed of at the Contractor's expense to an appropriate area off-site; said area to be approved by the Town of Stratford or other appropriate agencies.

C. The Contractor shall maintain suitable temporary stockpile area(s) at their own expense when necessary to facilitate the proper handling and processing of suitable excavation

materials to be re-incorporated back into the work. Work may include operations such as covering, mixing, and drying out of excavation materials to adjust moisture content as required for proper compaction of backfill.

23. INTERFERENCE WITH EXISTING WORKS:

A. The Contractor shall at all times conduct his operations so as to interfere as little as possible with existing works. The Contractor shall develop a program, in cooperation with the Engineer and interested officials, which shall provide for the construction and putting into service of the new works in the most orderly manner possible. This program shall be adhered to except where deviations there from are expressly permitted. All work of connecting with, cutting into, and reconstructing existing pipes or structures shall be planned to interfere with the operation of the existing facilities for the shortest possible time when the demands of the facilities best permit such interference. Before starting work, which will interfere with the operation of existing facilities, the Contractor shall do all possible preparatory work and shall see that all tools, materials, and equipment are made ready and at hand.

B. The Contractor shall make such minor modifications in the work relating to existing structures as may be necessary, without additional compensation. The Contractor shall have no claim for additional compensation by reason of delay or inconvenience in adapting his operations to the need for maintenance of the existing works.

24. PHOTOGRAPHS AND VIDEOS:

A. The Contractor shall conduct a pre-construction photograph and video survey documenting existing conditions, in accordance with Sections 01010 and 01740 and submit materials to the Engineer for review prior to the start of work.

B. Not less often that once a month, the Contractor shall submit progress photographs documenting the work in accordance with Sections 01010 and 01740 of these specifications.

25. HYDRAULIC UPLIFT OF STRUCTURES:

A. The Contractor shall be responsible for the protection of all structures against hydraulic uplift until such structures have been finally accepted by the Owner.

26. DISTURBANCES OF BOUNDS:

A. The Contractor shall replace and relocate all bounds and other property line location items disturbed by his operations, at his own expense.

B. The bounds shall be relocated and reset by a land surveyor licensed in the State of Connecticut.

27. MAINTENANCE AND PROTECTION OF TRAFFIC:

A. The Contractor shall establish and maintain a safe environment for workers, pedestrians, and vehicular traffic for the entire duration of the project.

B. Work shall be performed with minimum interference to public or private access to surrounding facilities.

C. The Contractor shall furnish, install, and maintain traffic control, warning, and safety devices such as cones, signs, lights, barricades, fencing, and other equipment as may be necessary to give proper and understandable warning to all persons of the dangers of entry onto or through the construction area(s).

D. Cones, signs, barricades, protective barriers, and other public safety items shall be illuminated or reflectorized for nighttime visibility.

E. In the event that the traffic control, warning, and safety devices are deemed inadequate, in the opinion of the Engineer, the Contractor shall provide additional or replacement devices as may be necessary, at no further cost to the Owner.

END OF SECTION

PURCHASING DEPARTMENT
TOWN OF STRATFORD
TERMS AND CONDITIONS OF BID

BID PROPOSALS

Bid proposals are to be submitted in a sealed envelope and clearly marked on the outside "BID #2026-15" including all outer packaging such as DHL, FedEx, UPS, etc. All prices and notations must be printed in ink or typewritten. No erasures are permitted. Bid proposals are to be in the office of the Purchasing Department, Town Hall, 2725 Main Street, Room 104, Stratford, Connecticut, prior to date and time specified, at which time they will be publicly opened.

RIGHT TO ACCEPT / REJECT

AFTER REVIEW OF ALL FACTORS, TERMS AND CONDITIONS, INCLUDING PRICE, THE TOWN OF STRATFORD RESERVES THE RIGHT TO REJECT ANY AND ALL BIDS, OR ANY PART THEREOF, OR WAIVE DEFECTS IN SAME, OR ACCEPT ANY PROPOSAL DEEMED TO BE IN THE BEST INTEREST OF THE TOWN OF STRATFORD.

POWER OF REJECTION

The Mayor shall have the power to reject all bids and to advertise again.

QUESTIONS

Questions concerning conditions, bidding guidelines and specifications should only be directed in writing to:

Mr. Phillip Ryan, Purchasing Agent: PRyan@townofstratford.com

Inquiries must reference date of bid opening, requisition or contract number, and must be received no later than as indicated in the bid documents prior to date of bid opening. Failure to comply with these conditions will result in the bidder waiving the right to dispute the bid specifications and conditions.

BID BOND

The BID BOND furnished, as bid security, must be duly executed by the bidder as principal. It must be in the amount equal to five percent (5%) of the total estimated bid, as guarantee that, in case the contract is awarded to the bidder, the bidder will, within ten days thereafter, execute such contract and furnish a Performance Bond and Payment Bond.

Small businesses may elect to obtain an irrevocable letter of credit or cashier's check in lieu of the Bid Bond. Such surety must also be in an amount equal to at least five percent (5%) of the total estimated bid.

All bid bonds shall be written by a surety company or companies licensed in the State of Connecticut, and shall have at least an A-VII policy holders rating, as reported by A.M. Best Rating Services, or otherwise deemed acceptable by the Town. The Town always reserves the right to reject surety companies, if an approved surety bond cannot be provided, the bidder shall be deemed non-responsive.

A complete list of certified surety companies can be accessed on the U.S. Government Department of Treasury website: https://www.fiscal.treasury.gov/fsreports/ref/suretyBnd/c570_a-z.htm

NOTE: Failure to provide a Bid Bond or equivalent security is not cause for a waiver defect. Any bid not accompanied by such security will be excluded from consideration.

PRICES

Prices quoted must be firm, for acceptance by the Town of Stratford, for a period of (120) days. Prices shall include all applicable duties. Bidders shall be required to deliver awarded items at prices quoted in their original bid.

F.O.B. DESTINATION

Prices quoted shall be net, delivered to destination. Bids quoting other than F.O.B. Destination may be rejected.

PERFORMANCE AND LABOR AND MATERIAL BOND

The successful bidder, within seven (7) business days after notification of award, will be required to furnish Performance and Labor and Material Bond provided by a company authorized to issue such bonds in the State of Connecticut, or Certified Check or properly executed Irrevocable Letter of Credit equal to a hundred per cent (100%) of the award.

In the event that the Contractor where required to provide evidence of insurance and a performance bond does not do so before beginning work, the Town of Stratford reserves the right to withhold payment from such supplier until the evidence of insurance and performance bond has been received by the Town.

All payment and performance bonds shall be written by a surety company or companies licensed to issue bonds in the State of Connecticut, and shall have at least an A-VIII policy holders rating, as reported by A.M. Best Rating Services, or otherwise deemed acceptable by the Town. The Town always reserves the right to reject surety companies, if approved surety bonds cannot be provided the contract shall be terminated.

A complete list of certified surety companies can be accessed on the U.S. Government Department of Treasury website: https://www.fiscal.treasury.gov/fsreports/ref/suretyBnd/c570_a-z.htm

BOND REQUIREMENT – NON-RESIDENT CONSTRUCTION CONTRACTORS

Overview: The law requiring nonresident construction contractors to furnish security for Connecticut taxes arising from jobs performed in Connecticut has been changed in the following major ways:

- Under the law as amended, there are two classes of nonresident contractors: verified and unverified. A nonresident prime or general contractor may gain verified status and thus eliminate the requirement to file a surety bond with the Department of Revenue Services (DRS), and a nonresident subcontractor may become verified and thus eliminate the requirement for the prime or general contractor to hold back a portion of the amount owed the subcontractor under the contract.
- Under the law as amended, a single surety bond for 5% of the entire project price is required to be filed with DRS by an unverified prime or general contractor where the contract price for the entire project is $250,000.00 or more. A person doing business with an unverified prime or general contractor for such a project must obtain proof that such contractor has filed a bond with DRS, but is no longer required to withhold an amount from payment due such contractor under the contract.
- A prime or general contractor must hold back 5% of the amount due an unverified subcontractor until the subcontractor obtains and furnishes AU-968, *Certificate of Compliance*, from DRS. An AU-968 authorizes the prime or general contractor to release all or a portion of the amounts held back from payment to the unverified subcontractor.

Prior law required compliance with one of three options to secure payment of Connecticut taxes for each contract with a nonresident prime or general contractor and with a nonresident subcontractor: (i) a nonresident contractor could furnish DRS a guarantee bond for 5% of the total contract price; or (ii) a nonresident contractor could furnish DRS a cash bond for 5% of the total contract price; or (iii) persons doing business with nonresident contractors would be required to withhold 5% of the total contract price and deposit it with DRS. This law meant that compliance with the law was required for each subcontract for a single project to real property in Connecticut. As under prior law, owners or tenants of residential real property are excluded from the requirements of Conn. Gen. Stat. §12-430(7).

More information may be obtained from: https://portal.ct.gov/DRS/Publications/Special-Notices/2011/SN-2011-17

PERMITS

The contractor shall be responsible for securing all necessary permits, state and local, and as required by the Town of Stratford.

PAYMENT PROCEDURES

No voucher, claim or charge against the Town shall be paid without the approval of the Director of Finance for correctness and legality.

PAYMENT PERIOD

The Town of Stratford shall put forth its best effort to make payment within thirty days (30) after delivery of the item acceptance of the work, or receipt of a properly completed invoice, whichever is later. Payment period shall be net thirty days (30) unless otherwise specified. For projects that do not require a performance or bid bond, The Town of Stratford reserves the right to retain five percent (5%) of total bid amount, which is payable ninety (90) days after final payment or acceptance of the work.

THE CONTRACTOR

The Contractor for the work described shall be thoroughly familiar with the requirements of all specifications, and the actual physical conditions of various job sites. The submission of a proposal shall be construed as evidence that the Contractor has examined the actual job conditions, requirements, and specifications. Any claim for labor, equipment, or materials required, or difficulties encountered which could have been foreseen had such an examination been carefully made will not be recognized.

ASSIGNMENT OF CONTRACT

No contract may be assigned or transferred without the consent of the Town of Stratford.

AWARD OF BIDS

Contracts and purchases will be made or entered into with the lowest responsible bidder meeting specifications, except as otherwise specified in the invitation. If more than one item is specified in the invitation, the Town of Stratford reserves the right to determine the low bidder on an individual basis or on the basis of all items included in the Invitation for Bids, unless otherwise expressed by the Town.

The Town will be reviewing proposals to ensure contractors/individuals/suppliers/vendors are not debarred or suspended.

The System for Award Management (SAM.gov):
https://sam.gov/content/home

CT Department of Labor:
https://portal.ct.gov/dol/knowledge-base/articles/wage-and-workplace-standards/debarment-lists?language=en_US

BIDDING FOR PUBLIC WORK OR IMPROVEMENT

Any public work or improvement costing more than twenty-five thousand ($25,000.00) dollars shall be executed by contract except where specified work or improvement is authorized by the council based on detailed estimates submitted by the department authorized to execute such work or improvement.

All contracts for more than twenty-five thousand ($25,000.00) dollars shall be awarded to the lowest responsible bidder, after public advertisement and competition, as may be prescribed by ordinance.

The Mayor shall establish reasonable regulations for prefiling sub bids on construction contracts where it is anticipated that the contracting party shall subcontract all or a portion of the work to be done.

Any public work or improvement costing more than twenty-five thousand ($25,000.00) dollars shall be executed by contract except where specified work or improvement is authorized by the Council based on detailed estimates submitted by the Department authorized to execute such work or improvement. All contracts under this section shall be awarded by the Town Council to the lowest responsible bidder, after public advertisement as specified above.

NONUSE OF WASTES

A. All bids and contracts related to the retention of services to construct or maintain any publicly owned and/or maintained road or real property within the Town of Stratford shall include a provision stating that no materials containing natural gas or oil waste shall be utilized in providing such a service.

B. All bids and contracts related to the purchase or acquisition of materials to be used to construct or maintain any publicly owned and/or maintained road or real property within the Town of Stratford shall include a provision stating that no materials containing natural gas or oil waste shall be provided to the Town of Stratford.

C. The following statement, which shall be a sworn statement under penalty of perjury, shall be included in all bids related to the purchase or acquisition of materials to be used to construct or maintain any publicly owned and/or maintained road or real property within the Town of Stratford and all bids related to the retention of services to construct or maintain any publicly owned and/or maintained road or real property within the Town of Stratford:

"We ____ hereby submit a bid for materials, equipment and/or labor for the Town of Stratford. The bid is for bid documents titled ____. We hereby certify under penalty of perjury that no natural gas waste or oil waste will be used by the undersigned bidder or any contractor, subcontractor, agent or vendor agent in connection with the bid; nor will the undersigned bidder or any subcontractor, agent or vendor agent thereof apply any natural gas waste or oil waste to any road or real property within the Town of Stratford as a result of the submittal of this bid if selected."

CHANGE ORDERS

Approval Required: Except as specified herein, when any public work or improvement has been executed by contract, no changes in the terms, conditions or scope of said contract nor deviations from the specifications made a part of that contract which would result in any way in an increase in the cost of that contract to the Town shall be allowed except by the approval of the Council.

Review: Any request for change orders shall first be considered by an appropriate committee appointed and then referred to the Council for appropriate action.

Mayor's Approval: Notwithstanding any provision to the contrary herein, the Mayor, acting upon the advice of the Town Engineer, shall have the authority to approve any such changes or deviations without the approval of the Council, provided that the cost of any such changes or deviations does not exceed the sum of $5,000.00 and further provided that, in the opinion of the Mayor, due to extraordinary conditions, unforeseen contingencies, market conditions or the nature of the requested change, it would not be feasible or in the best interest of the Town to delay approval of the requested change.

Change Order Profits: Maximum mark-up of 15% on labor and materials costs on change order work performed by Contractor, and 5% mark-up on work performed by Subcontractor.

GUARANTEE

Equipment, materials and/or work executed shall be guaranteed for a minimum period of one (1) year against defective material and workmanship. The cost of all labor, materials, shipping charges and other expenses in conjunction with the replacement of defective equipment, and/or unsatisfactory work, shall be borne by the Contractor.

CATALOGUE REFERENCE

Unless expressly stated otherwise, any and all reference to commercial types, sales, trade names and catalogues are intended to be descriptive only and not restrictive; the intent is to indicate the kind and quality of the articles that will be acceptable. Bids on other equivalent makes, or with reference to other catalogue items will be considered. The bidder is to clearly state exactly what will be furnished. Where possible and feasible, submit an illustration, descriptive material, and/or product sample.

OSHA

The bidder will certify all equipment complies with all regulations and conditions stipulated under the Williams-Steiger Occupational Safety and Health Act of 1971, as amended. The successful bidder will further certify that all items furnished under this project will conform and comply with Federal and State of Connecticut OSHA standards. The successful bidder will agree to indemnify and hold harmless the Town of Stratford for any and all damages that may be assessed against the Town.

U.S. Department of Labor / Workplace Safety & Health: https://www.dol.gov/general/topic/safety-health

LIFE CYCLE COSTING

Where applicable, Life Cycle Costing will be used as a criterion for awarding bids. This is a method of calculating total cost of ownership of an item over the life of the product, which may include operation and maintenance expenses, transportation, salvage value, and/or disposal costs.

INSURANCE

The Contractor shall not commence any work under the Contract until all insurance required by this section has been obtained and Certificates of Insurance and any other evidence of required coverage requested by the Town, including a copy of the policy itself, have been received and approved by the Town.

Such policies shall stipulate that no coverage can be changed or canceled, including for non-payment of premium, unless the Town has had thirty (30) days prior notice in writing. Certificates of renewals or changes in policies shall be delivered to the Owner at least thirty (30) days prior to the expiration of the policy.

All insurance issuers chosen by the Contractor must be licensed to do business in the State of Connecticut and rated A- or better by A.M. Best Rating Services.

The Town always reserves the right to reject insurance companies, if approved insurance policies cannot be provided the contract shall be terminated.

The insurance requirements set forth below are minimum limits of coverage only and in no way limit the Contractor's liability.

The following insurance is required to be maintained in full force until all work required by the contract has been fully completed, except that Products/Completed Operations coverage shall be maintained for five (5) years.

Worker's Compensation: The Contractor shall carry Worker's Compensation and Employer's Liability Insurance in the form and in such amounts as may be currently required to comply with the Labor Laws of the State of Connecticut. Statutory Limits.

Automobile Insurance: The Contractor shall carry and maintain during the life of the Contract a policy with a combined single limit of $1,000,000.00 CSL.

This policy shall include all liability of the Contractor arising from the operation of all self-owned motor vehicles used in the performance of the Contract; and shall also include a "non-Ownership" provision covering the operation of motor vehicles not owned by the Contractor, but used in the performance of the work.

Commercial General Liability:

- General Liability & Property Damage: $10,000,000 Occ/Agg
- Owner's Protective Liability: $1,000,000

This policy shall include Subcontractor's Liability coverage, protecting the Contractor and the Town against liability arising out of the activities of Subcontractors engaged by him/her in the performance of the work.

Umbrella Policy: An umbrella policy in the amount of $5,000,000.00 covering general liability, auto liability, and employer liability is required.

Pollution Liability Insurance: Where applicable, a policy in the amount of $5,000,000.00 including coverage for transport and other offsite risks. Such policy must be provided to the Town for review and determination of acceptability before an award will be made.

Waiver of Subrogation: Waiver of subrogation is required on all policies.

Additional Insureds: The Town of Stratford, its officers, officials, employees, agents, boards, and commissions shall be named as Additional Insureds. The coverage shall be primary and non-contributory and contain no special limitations on the scope of protection afforded to the Town of Stratford. A waiver of subrogation applies under general liability, auto liability and workers compensation.

The coverage shall be primary and non-contributory and contain no special limitations on the scope of protection afforded to the Town of Stratford. A waiver of subrogation applies under general liability, auto liability and workers compensation.

Subcontractor's Insurance: Each Subcontractor engaged by the Contractor to perform any work under the Contract shall obtain all insurance required of the Contractor in the same amounts and subject to the same provisions specified above for the Contractor, including the Additional Insured requirement. Certificates of Insurance shall be submitted to the Contractor and the Town and approved by the Town, before commencing any work.

HOLD HARMLESS

Contractor shall defend, indemnify, and hold harmless the Town of Stratford, its officers, employees, agents or volunteers, from and against any and all claims and demands of any nature for any loss, damage or injury which any person may suffer by reason of, or in any way arising out of, this Agreement, unless caused by the sole negligence of the Town.

FEDERAL, STATE, AND LOCAL LAWS

All applicable Federal, State and local laws, rules and regulations of all authorities having jurisdiction over the locality of the project shall apply to the contract and are deemed to be included herein**.** If the total amount of the project, including any current or future change orders, exceeds $100,000.00 all work is to be done in accordance with Connecticut Department of Labor (CT-DOL) rules and regulations. More information may be obtained from: www.ctdol.state.ct.us

The Davis-Bacon and Related Acts, shall apply to contractors and subcontractors performing on federally funded or assisted contracts in excess of $2,000.00 for the construction, alteration, or repair (including painting and decorating) of public buildings or public works. More information may be obtained from: https://www.dol.gov/whd/govcontracts/dbra.htm

NOTE: The Town shall apply the most current wage decision applicable at the time of contract award.
It is the Contractor's responsibility to obtain work classifications not included in the Wage Decisions package.

CONFLICT OF INTEREST

No officer or employee or member of any elective or appointive board, commission, committee or council of the Town, whether temporary or permanent, shall have or acquire any financial interest gained from a successful bid, direct or indirect, in any project, matter, contract or business within his/her jurisdiction or the jurisdiction of the board, commission, committee or council of which he/she is a member. Nor shall the officer / employee / member have any financial interest, direct or indirect, in any contract or proposed contract for materials or services to be furnished or used in connection with any project, matter or thing which comes under his/her jurisdiction or the jurisdiction of the board, commission, committee or council of which he/she is a member.

SCOPE OF WORK / SITE INSPECTIONS
The bidder declares that the scope of the work has been thoroughly reviewed and any questions resolved (see above for name and number of individual to contact for questions). If applicable, the bidder further declares that the site has been inspected as called for in the specifications (q.v.).

EXCEPTION TO SPECIFICATIONS
No protest regarding the validity or appropriateness of the specifications or of the Invitation for Bids will be considered, unless the protest is filed in writing with the Purchasing Agent prior to the closing date for the bids. All bid proposals rendered shall be considered meeting the attached specifications unless exceptions are noted on a separate page dated and signed by the bidder.

UNLESS OTHERWISE NOTED
It will be assumed that all terms and conditions and specifications will be complied with and will be considered as part of the Bid Proposal.

TAX EXEMPT
Federal Tax Exemption 06-6002103.
Exempt from State Sales Tax under State General Statues Chapter 219-Section 12-412 Subsection A.

SUPPLEMENTAL
A. Performance bond covering 100% of the contract price is required for contracts over $100,000.00 (C.G.S. 49-41).
B. CT-DEEP/CWF/FEMA is an Affirmative Action, Equal Opportunity Employer.
C. It is a requirement of all contractors and subcontractors for affirmative action to ensure equal opportunity for employment as noted under Executive Order No. Three.
D. Project is paid for in part by CT-DEEP/CWF and provided by FEMA Pre-Disaster Mitigation Program (PDM).
E. Contractors must comply with State Prevailing Fair Wage Provisions (for new construction projects over $1,000,000.00 and remodel/repair projects over $100,000.00 – C.G.S. 31-53(g)). See more information below.
F. Contractor must comply with DAS Contractor Prequalification requirements, if applicable (>$1,000,000.00).

Any contract or contracts awarded under this invitation for bids are expected to be funded in part by the State of Connecticut (Department of Energy and Environmental Protection). Neither the State of Connecticut nor any of its departments, agencies, or employees is or will be a party to this invitation for bids or any resulting contract. This procurement will be subject to the requirements contained in Section 22a-482-4 (h), (j), and (o) of the regulations of Connecticut State Agencies, which are included as an attachment to Section 00800, Supplementary Conditions.

Disadvantaged Business Enterprise (DBE) goals are applicable to the total dollars paid to the construction contract. The goals imposed by the Connecticut DEEP for this project are a minimum of 3.00 percent for Minority Business Enterprise (MBE) participation and 5.00 percent for Women's Business Enterprise (WBE) participation by certified DBEs. The Bidder shall submit the required DEEP acknowledgement form, which is provided in the bid documents, with their bid. Failure to comply with the requirements of this paragraph may be deemed to render a proposal non-responsive.

The project is subject to the American Iron and Steel (AIS) requirement of Section 436 of Public Law (P.L.) 113-76, Consolidated Appropriations Act, 2014, which requires that all of the iron and steel products used in the project are produced in the United States. Section 00800 contains further information on applicable iron and steel products and compliance.

Financial Assistance:
A. Connecticut Department of Energy & Environmental Protection (CT-DEEP) - Clean Water Fund (CWF).
B. Department of Emergency Services & Public Protection – Division of Emergency Management & Homeland Security. FEMA Subgrant Award: PDMC-PJ-01-CT-2017-006. Fed Grant No: EMB-2018-PC-0005.
Amount: $7,556,800 (Federal: $2,729,770.90 / Local Match: $4,827,029.10)

DAS Prequalification of Bidders:
Bidders shall be Department of Administrative Services (DAS) pre-qualified under the category of "Water Treatment Plants". Bidders are advised that both the DAS Prequalification Certificate and Update (Bid) Statement must accompany the bid proposal. Failure to supply these forms with the bid will result in rejection of the bid.

A. Municipal contracts for the construction or renovation of a public works project, where the estimated value is $1,000,000.00 or greater, will need to comply with C.G.S. Sec. 4b-91. In such cases the contractors must be pre-qualified by the State of Connecticut Department of Administrative Services (DAS). When applicable, this requirement will need to be included in the Invitation to Bid as a prerequisite for selecting the Lowest Responsible and Qualified Bidder.

B. "Prequalification" means prequalification issued by DAS to bid on a contract or perform work pursuant to a contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or any other public work by the state or a municipality.

C. It is permissible to use AIA form A305, Contractor's Qualification
   i. Statement, as a prerequisite to bidding, provided prequalification.
   ii. Does not prevent minority/women owned firms from bidding.
   iii. Consult your architect.

Effective October 1, 2023 DAS Construction Contractor Prequalification Program

- Contractors bidding on a contract for work for the state or a municipality that is estimated to cost more than $1,000,000 and is funded, in whole or in part, by state funds must be prequalified. Effective October 1, 4a-100 of the general statutes is increasing the requirement for prequalification for projects from $500,000 to $1,000,000.
- Responses to solicitations over $500,000 but under $1,000,000 will not require DAS Prequalification however the solicitation will require the bidder to provide specific information including but not limited to business organization information, legal administrative procedures, qualification status, and workforce development initiatives.

CODE OF FEDERAL REGULATIONS – PROCUREMENT STANDARDS

This project is being funded in part by a grant from the Federal Emergency Management Agency (FEMA) through its Pre-Disaster Mitigation Grant Program. All work must comply with federal procurement rules under 2 CFR §§ 200.317-326 and required federal contract provisions will be included in the final contract. The successful bidder must certify that they are not suspended or debarred from federal contracting and comply with applicable federal laws including Equal Employment Opportunity, Anti-Lobbying, and the Contract Work Hours and Safety Standards Act. FEMA and other federal agencies reserve the right to audit records related to this contract due to funding involvement.

Link: https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-D/subject-group-ECFR45ddd4419ad436d

ARCHAEOLOGICAL FINDS

If the Contractor's operations expose any items that may indicate an archaeological find, such as, but not limited to, building remains, hardware, accumulations of bones, pottery, or arrowheads, the Contractor shall immediately notify the Town of Stratford ("Town") and suspend operations within the immediate area identified.

Notification may be verbal, provided that such notice is confirmed in writing within two (2) business days. Work shall remain suspended within the area, until otherwise directed by the Town in writing.

Any delay in the completion of the Contract that is caused by such a suspension of Work shall be considered to be an event entitling the Contractor to request payment for the cost of such delays.

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ATTACHMENTS

A1 – Regulatory authorization documents received as of date of specification preparation:

- Town of Stratford: Connecticut Inland Wetlands & Watercourses (IWWC) Permit #2013-13
- Town of Stratford: Coastal Site Plan Review Letter
- Town of Stratford: Erosion and Sediment Control Plan Review Letter
- CT DEEP: Dam Safety Permit No. DS-202409162
- CT DEEP: NDDB Determination Letter – New Determination Number: 202302737
- CT DEEP: Flood Management Certification (License No. 202203630-FM)
- FEMA: REC for Project PDMC-PJ-010CT-2017-006 (0)

A2 – "Geotechnical Engineering and Environmental Data Report, Stratford Water Pollution Control Facility, 105 Beacon Point Road, Stratford, Connecticut", dated February 20, 2023, prepared by GZA GeoEnvironmental, Inc.

A3 – Prior Construction Drawings:

- "Town of Stratford, Connecticut – System of Sewers – Contract No. 2 – Construction of Secondary Treatment Facilities at Stratford Water Pollution Control Plant," by Charles A. Maguire & Associates, Inc., dated 1970 (1970 C.A.M. Drawings).
- "Town of Stratford, Connecticut – Hurricane Protection for Water Pollution Control Plant – Contract No. 12," CE Maguire, Inc., dated 1974 (1974 C.E.M Drawings).
- "Town of Stratford, Connecticut – Contract No. 06-01 – Water Pollution Control Facility Upgrade," by Camp Dresser & McKee Inc., dated March 2006, As built drawings revised August 23, 2010 (2010 CDM Drawings).

A4 – Contract Drawings

SECTION 01010

SUMMARY OF WORK

PART 1. GENERAL

1.1 INTENT OF THE WORK

A. Work of the Contract is shown and described by Drawings, Specifications, and Project Manual entitled:

WATER POLLUTION CONTROL FACILITY

FLOOD PROTECTION SYSTEM IMPROVEMENTS

Town of Stratford, Connecticut

Contract No.: 2026-15

B. The proposed Water Pollution Control Facility Flood Protection System Improvements (Project) for the existing Water Pollution Control Facility (WPCF) located off of Birdseye Street and Beacon Point Road in Stratford, Connecticut is intended to improve the flood resiliency capabilities of the WPCF by:

1. Increasing the existing dike and levee flood protection elevations with supplemental earthwork.
2. Constructing new pile-supported, reinforced concrete floodwall segments.
3. Providing deployable flood gate structures (stop logs) to close gaps in the perimeter flood protection system.

C. For the purposes of this Contract, the WPCF is owned and operated by the Town of Stratford, Connecticut (Town or Owner). Upon completion of the Work of this contract, WPCF flood protection improvements will have been constructed and all required incidental work and site restoration will have been performed in accordance with the Plans and Specifications provided as part of the Bid Documents. The Contractor is referred to the Contract Drawings, which along with these Specifications, define the required work.

1.2 LOCATION OF THE WORK

A. The WPCF (Site) is located at 105 Beacon Point Road in the Town of Stratford, Connecticut. The Site is located on the western shore of the Housatonic River, roughly one mile upstream of the point where the river empties into Long Island Sound. The Site is located at Latitude 41°10’40.44” N, Longitude 73°7’34.96” W, and can be found on the USGS Bridgeport, CT and Milford, CT 2024 quadrangle maps.

B. The Contract Drawings specifically delineate the project area, including staging and lay-down areas for the Contractor, as well as areas not to be disturbed. The Contractor shall strictly comply with these boundaries. Proper environmental and housekeeping procedures by the Contractor are of the highest priority, as required by the environmental permits secured for the work.

1.3 DESCRIPTION OF THE SITE

A. The WPCF is a critical Town asset. The WPCF has the capacity to treat 11.5 million gallons of sewage per day (average; 19.5 MGD maximum and 39 MGD peak hourly flow). It is operated 24 hours per day, 7 days per week. The processed wastewater is released into the Housatonic River. The Site is approximately 15.7 acres in area and is bounded to the north by Birdseye Street, to the east by Beacon

Point Road, and to the south and west by Town-owned and private properties fronted by Elm Street and Main Street. The Housatonic River borders the east side of Beacon Point Road. Coastal and inland wetlands exist along the western side of the Site. The wetlands located along the west side of the Site are hydraulically connected to WPCF stormwater infrastructure.

B. The existing WPCF perimeter flood protection system consists of earthen dikes and levees constructed in the 1970s, including segments of certain perimeter roads. The WPCF includes paved and rough access areas (roads, driveways, walkways, parking, etc.); various wastewater treatment equipment, structures, and appurtenances (tanks, pumps, piping, diversion chambers, etc.); stormwater drain, basins, and swales; buried natural gas, electric, and water utilities; overhead electric lines; electrical substations; backup generators; and control, office, and maintenance buildings. Remaining areas of the WPCF are typically covered with lawn and occasional trees or other landscaping features. The WPCF is mostly surrounded by a chain-link fence with gate openings at driveways. There are three existing paved driveways that provide access to the WPCF: one located near the northwest corner of the Site from Birdseye Street, another located near the southwest corner of the Site from the Animal Shelter Driveway, and the main facility entrance from Beacon Point Road.

C. Based on review of the 2016 Statewide LiDAR data provided by the Capitol Region Council of Governments (2016 LiDAR), the existing site grades within the WPCF interior (exclusive of the perimeter flood protection dikes and levees) generally range from about elevation 5 feet to 10 feet, referenced to the North American Vertical Datum of 1988 (NAVD88).

D. Based on review of the 2016 LiDAR, existing perimeter flood protection crest elevations generally include:

1. North Side (Birdseye Street and Access Drive): Elevation 9 (top of the northwest driveway) to 11 feet NAVD88 (intersection of Birdseye Street and Beacon Point Road). The high point of Birdseye Street, adjacent to the Site, is approximately elevation 13 feet NAVD88. Existing Site grades within the area between Birdseye Street and Access Drive (outside of the perimeter flood protection) range down to a low point of about elevation 5 feet NAVD88 at the bottom of the northwest driveway.
2. East Side (Beacon Point Road): Elevation 11 to 13 feet NAVD88.
3. South Side (off South Road and off southern end of Beacon Point Road): Elevation 11 to 12 feet NAVD88. However, grades along the south side of the perimeter flood protection alignment increase up to about elevation 18 feet NAVD88 over limited distances.
4. West Side (North Road and off South Road): Elevation 9 (north end) to 12 feet NAVD88 (south end).

E. Based on review of record construction drawings entitled “Hurricane Protection for Water Pollution Control Plant,” by C.E. Maguire, dated July 1975, the existing dikes and levees were constructed as earthen berms with an impervious fill (soil) core and side slopes typically ranging from 2H:1V to 2.5H:1V, or flatter. The width of the existing crest ranges from approximately 8 feet (south and west sides) to more than 40 feet where the top of the existing structure coincides with Birdseye Street and Beacon Point Road. The flood-side slopes along Birdseye Street, Beacon Point Road, North Road, and South Road are protected with a stone riprap layer. A toe drain is occasionally indicated at the bottom of slope on the landward side of the existing levees and dikes.

F. The Site is located within mapped Federal Emergency Management Agency (FEMA) 1-percent Annual Chance Flood Hazard Zones AE and VE, with Base Flood Elevations (BFE) of 14 and 13 feet, respectively. The Site is also located with FEMA's mapped Limit of Moderate Wave Action (LiMWA). The Site is vulnerable to coastal flooding principally due to its relatively low-lying ground surface elevations and its proximity to the Housatonic River. The existing perimeter flood protection system partially protects the WPCF from coastal flooding. However, the WPCF remains vulnerable due to floodwater entry points characterized by lower areas in the perimeter flood protection; potential for temporary increases in groundwater levels during coastal flood events; backflow through stormwater and wastewater pipes and other buried utility penetrations; localized precipitation/stormwater runoff within the Site footprint; and extreme flood elevations exceeding the existing flood protection crest elevations.

1.4 GENERAL SCOPE OF THE WORK

A. The proposed Project is an improvement of the existing perimeter flood protection system at the WPCF to increase its flood resiliency capabilities. The proposed Project is designed in accordance with the Connecticut Dam Safety Statutes & Regulations and consistent with the mission of the Connecticut Department of Energy & Environmental Protection (DEEP) Dam Safety Regulatory Program.

B. It is the intent of the Town of Stratford that the completed Project should result in an improved perimeter flood protection system constructed with additional earthen embankment, a stone-filled gabion retaining wall, new pile-supported reinforced concrete floodwall segments, erosion protection, seepage control (underdrain), stormwater infrastructure improvements (check valves), deployable flood gate structures (stop logs) to close gaps at remaining roadway crossings with associated on-Site storage solutions, and other incidental items or related improvements.

C. The Project scope of work also includes the remediation of existing flood protection system penetrations formed by abandoned stormwater and plant effluent pipes by removal and filling, limited perimeter chain link fence and gate improvements, limited pavement and curbing replacement, and the limited in-kind replacement of the WPCF water service line. Site features disturbed by the Work and not scheduled for permanent removal, modification, relocation, and/or improvement will be restored in-kind to match pre-construction conditions. All areas within the proposed limits of disturbance without existing pavements or structures, and for which another finish treatment (e.g., riprap slope protection, pavement, gravel, etc.) is not specified shall be prepared with topsoil, seeded, and establish turf as described in Section 02930, or as approved by the Owner. It is the Project intent to reuse all existing, suitable, excavated soil and stone materials in the proposed Work to the maximum extent possible.

D. The proposed Work includes but is not limited to the following:

1. Provision and erection of Project signage;
2. Establishment and maintenance of on-site survey controls;
3. Mobilization of equipment and materials to the Site;
4. Installation and maintenance of sedimentation and erosion controls, stabilized construction access, and preparation of construction staging and laydown areas;
5. Utility clearance, locating, verification, protection, relocation, and coordination (The Contractor shall document the condition of existing subsurface utilities potentially affected by the proposed work by appropriate methods, including but not limited to exposure and direct observation using minimally invasive excavation, where required and as necessary to avoid conflict with the proposed work, damage, injury, or service interruption);

6. Site clearing and grubbing of existing vegetation;
7. Stripping and temporarily stockpiling existing topsoil for reuse on-site;
8. Salvage, processing, relocation, and storage of existing suitable riprap for reuse on-site;
9. Demolition, removal, and disposal of existing pavements, curbing, guide rail, fencing, abandoned utilities, materials unsuitable for reuse, and other Site features as required and as necessary to perform the proposed work;
10. Removal and replacement of a limited segment of existing water service to the Site;
11. Temporary perimeter fencing (construction fencing) as required;
12. Plugging and filling abandoned subsurface utilities and structures as required;
13. Protection, replacement, or restoration of unimproved existing Site features to remain or not scheduled for demolition and removal;
14. Excavation to proposed subgrades, support-of-excavation, and dewatering;
15. Installation of drilled micropile (DMP) and auger-cast pile (ACP) foundations;
16. Installation of reinforced concrete floodwall pile caps, stemwalls, and gate posts;
17. If Add Alternates are awarded, installation of textured architectural concrete finish on corresponding faces of the reinforced concrete floodwall stemwalls;
18. Installation of improved dike and floodwall embankments to proposed grades (impervious fill, crushed stone, gravel, riprap slope protection and apron);
19. Maintaining the current level of perimeter flood protection (at minimum) for the WPCF that currently exists if floods occur during construction;
20. Delegated design and installation of stone-filled gabion retaining wall;
21. Installation of underdrain and cleanouts and connection to existing stormwater infrastructure;
22. Installation of in-line tide check valves at existing drain structures;
23. Installation of crushed stone pads to support deployable flood gate storage units;
24. Delegated design, delivery, installation, and test fitting of deployable flood gate systems and associated storage;
25. Restoration and installation of new perimeter chain link fences and swing gates;
26. Installation of terminal ends at the limits of existing metal guide rail removal;
27. Raising and resetting all existing and proposed utility structure covers and grates within the limits of work to finished grade;
28. Restoration and limited improvements of bituminous (HMA) pavement and curbing;
29. Completion of backfilling and restoration of grades as required;
30. Installation of topsoil and seed to lawn;
31. Completion of required miscellaneous and incidental work;
32. Demobilization of equipment and removal of excess materials from the Site.

E. The Contractor shall maintain public safety during all phases of the Project.

F. The Contractor shall be responsible for coordinating all traffic control measures, temporary and partial roadway closures, police details, and related measures with the Town of Stratford Department of Safety and other authorities as appropriate.

G. Wetland resources abut and are located nearby various elements of the work. The work shall not encroach into wetlands beyond the limit of work in compliance with the Town Inland Wetlands and Watercourses permit.

H. The work required by the Contract Drawings and Specifications shall include furnishing all labor, skill, supervision, tools, construction plant, equipment and materials and performing all operations necessary for the proper completion of the contract work as shown on the Plans and Specifications, and as required by the Owner. The general scope of work and anticipated project sequence are outlined on Drawing G-002, which lists many but not all work items included under this Contract.

I. The Contractor shall also provide all materials, fuels, labor, and other items necessary for the protection of the Work from hot weather, cold weather, precipitation, surface water flow, groundwater, coastal storm surge and waves, or other potentially adverse conditions which might cause harm to completed work or work underway. The Contractor shall be prepared to remove personnel, equipment, and materials from areas of potential inundation in the event of excessive flows and be prepared to restore any damage and resume work at the site.

J. The Connecticut Department of Transportation (ConnDOT) Standard Specifications for Roads, Bridges and Incidental Construction are referenced for materials and/or procedures ONLY.

1.5 ENVIRONMENTALLY SENSITIVE WORK

A. The Contractor is informed that the Work of the Project is within and around environmentally sensitive areas. The Contract Drawings specifically delineate staging and lay-down areas for the Contractor, as well as areas not to be disturbed. The Contractor shall comply with these boundaries. Proper environmental and housekeeping procedures by the Contractor are of highest priority. The Contractor shall comply with all applicable local, state, and federal environmental regulations and the requirements of all regulatory permits obtained for the Project. Copies of local Inland Wetlands and Watercourses and Zoning Commission, and Connecticut DEEP Dam Safety regulatory permit documents obtained for this project are included in the Contract Documents.

B. The Contractor is, therefore, strongly urged to become intimately familiar with access and other issues at the Site to better develop a comprehensive work plan and a more informed bid. The Contractor is encouraged to spend as much time as is needed at the Site to develop an understanding of the location and the proposed Work.

1.6 SPECIAL PROVISIONS

A. The Contractor is hereby notified that the Work of this Contract involves construction on and around an existing flood protection system that was initially constructed in the 1970s. The existing flood protection system and proposed improvements provide flood protection to the WPCF, which is a critical “Critical Activity” per CGS 25-68b and as determined by CT DEEP. The Project must also be performed in accordance with various funding requirements. As such, several special provisions will be necessary for the successful completion of the Work. Such provisions shall include, but not be limited to, the following:

1. Safety: This project is subject to the Safety and Health Regulations (CFR 29, Part 1926 and all subsequent amendments) as promulgated by the U.S. Department of Labor on June 24, 1974, and

CFR 29, Part 1910, General Industry Safety and Health Regulations Identified as Applicable to Construction.

a. The Contractor shall comply with the Department of Labor Safety and Health Regulations for Construction promulgated under the Occupational Safety and Health Act of 1970 (PL-91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL-91-54).

b. The Contractor shall have a competent person or persons, as required under the Occupational Safety and Health Act on the Site to inspect the Work and to supervise the conformance of the Work with the regulations of the Act.

2. Archaeological Finds: Should the Contractor or Engineer discover evidence of remains, such as stone masonry building foundations, bones or other items of archaeological significance, Contractor shall report these findings to (1) Owner, (2) Local Historical Society, (3) State Historic Preservation Office (860) 500-2329, and (4) Resident Project Representative, and shall exercise the utmost care to ensure that these areas remain undisturbed.

   a. Contractor shall allow recovery of such finds by the authorities, shall not remove such artifacts under penalty of law, and shall prevent constriction or private vehicles from crossing over these areas. In addition, when directed by the Engineer, cover these areas with 1-ft common fill to the limits directed by the Engineer.

   b. Be advised that graves and any associated human remains are protected by Connecticut State law (C.G.S. Section 10-388 and 10-390). Any possible human skeletal remains must be reported to the State Archaeologist (860) 486- 5248 and the State's Chief Medical Examiner (860) 679-3980 immediately upon discovery. If the State Archaeologist is unavailable, please contact the State Historic Preservation Office at the number above for immediate assistance.

3. Water Control: Water control is of paramount importance for the successful execution of the Work. This shall include, but not be limited to, construction of cofferdams, control of surface water, control of seepage and groundwater, etc.

   a. The Contractor shall have contingency plans in place to deal with potential flooding events that may occur during the execution of the work. It is the Contractor’s sole responsibility for the control of water in and around the work area.

4. Erosion and Sediment Control: Erosion and Sediment control measures shall be used during construction as required by environmental permits, as depicted on the drawings, and as required to protect areas inside and outside the limits of work. Such measures shall be used both around the perimeter and within the interior of the site to protect the adjacent river and wetlands, on-Site and nearby stormwater receptors, and downstream resources.

   a. The Contractor shall perform all work required to provide, install, maintain and remove sediment and siltation control measures necessary to protect resource areas from siltation, sedimentation, or siltation damage or other damage related to the Work or work areas.

   b. Sedimentation and siltation control measures shall include, silt fence, turbidity curtains, erosion control socks, straw bales, silt sacks, erosion control blankets and other items as necessary. Other measures not specifically called for on the plans may be required to address conditions encountered during construction.

   c. The Work shall also include all work necessary to continually clean and maintain and promptly repair/replace all sedimentation and siltation measures as needed to sustain their intended function and operability.

5. Access to Site: The Owner, Engineer, CT DEEP or other authorized representatives, and any local agencies having a direct interest in the Work shall have access at reasonable times to the Site, project records, and to the Work wherever it is in preparation or progress. The Contractor shall provide proper facilities for such access and inspection.

   a. The Work of the Contract shall include all necessary measures to exclude the public including pedestrians and recreational users from the limits of work. This shall include the provision of appropriate fencing, gates, signage, and flagmen, as needed. Such users shall also be protected from construction traffic in areas when construction vehicles are entering or exiting the job site.

   b. The Work of the Contract involves the limited removal, relocation, restoration, replacement, and improvement of existing fences and gates located around the Site perimeter and crossing the Animal Shelter Driveway. The Contractor is responsible for securing areas of work and maintaining the continuity and function of existing fences and gates impacted by the work throughout the duration of the Project. Temporary measures, such as approved temporary chain link fence and gate panels or equivalent devices, are to be provided, installed, and maintained by the Contractor until permanent fence relocation, restoration, replacement, and improvements are complete and the work is accepted by the town.

1.7 CONTRACT DRAWINGS

A. The location and general character of the work are shown on the Contract Drawings which include the following plans and drawings:

Drawing No.	Title
G-001	Title Sheet, Site Locus, And Drawing Index
G-002	General Notes
G-101	Existing Site Plan
G-102	Existing Flood Protection Typical Sections and Details
G-103	Existing Stormwater Infrastructure Details (1)
G-104	Existing Stormwater Infrastructure Details (2)
G-201	Existing Sections (1)
G-202	Existing Sections (2)
G-203	Existing Sections (3)
G-204	Existing Sections (4)
C-101	Proposed Sediment, Erosion Control, Site Access, and Laydown Plan
C-102	Proposed Site Clearing, Grubbing, and Demolition Plan
C-103	Work Plan - Key Plan
C-104	Work Plan (1)
C-105	Work Plan (2)
C-106	Work Plan (3)
C-107	Work Plan (4)
C-108	Work Plan (5)
C-109	Grading Plan (1)
C-110	Grading Plan (2)
C-111	Grading Plan (3)
C-112	Grading Plan (4)

Drawing No.	Title
C-113	Grading Plan (5)
C-114	Proposed Profiles (1)
C-115	Proposed Profiles (2)
C-201	Proposed Sections (1)
C-202	Proposed Sections (2)
C-203	Proposed Sections (3)
C-204	Proposed Sections (4)
C-205	Proposed Sections (5)
C-206	Proposed Sections (6)
C-207	Proposed Sections (7)
C-208	Proposed Sections (8)
C-301	Typical Sections and Site Details (1)
C-302	Erosion and Sediment Control Details
C-303	Erosion and Sediment Control Narrative
HW-910_01	W-Beam Metal Beam Rail Hardware
HW-910_02	Metal Deam Rail (Type R-B 350) Guiderail
HW-910_17	R-B Terminal Section
HW-913_01a	Chain Link Fence
HW-913_01b	Chain Link Fence Hardware
HW-913_02	Chain Link Fence Gates
S-101	Flood Wall Foundation Plan (1)
S-102	Flood Wall Foundation Plan (2)
S-103	Flood Wall Foundation Plan (3)
S-104	Flood Wall Foundation Plan (4)
S-201	Typical Sections Wall-1 and Wall-2
S-202	Typical Sections Wall-3
S-203	Typical Sections Wall-4, Wall-5, and Wall-6
S-301	Flood Wall Details
S-401	Deployable Flood Gate Notes
S-402	Gate-A Details
S-403	Gate-B Details
S-404	Gate-C Details
S-405	Gate Details

B. The work shall be constructed in accordance with said plans and such further working and details plans as may be furnished from time to time by the Owner. Details shown on said plans are indicative of the types of structures required and are subject to revision, alteration, modification, and variation. Such revisions, alterations, modifications, or variations in said plans are as desirable in the opinion of the Owner, on account of conditions encountered or for other reasons, shall not be considered a variation of terms of this Contract and the assent of the surety on the bond accompanying this Contract to such revisions, alterations, modifications, or variations shall not be required.

C. All said plans, general notes and details, and the specifications shall be considered together, so that any work shown on the plans, though not mentioned in this Contract and any work mentioned in the Contract, though not shown on the plans, shall be executed by the Contractor as part of the performance of this Contract. Figured dimensions shall prevail over scaled. All things which, in the opinion of the

Owner, may fairly be inferred from the plans shall be executed by the Contractor as part of the Contract, and the Owner shall be the sole judge as to whether the detail plans conform to the general plans.

D. Plans, calculations, estimates of quantities, and any statements made in the instructions to Bidders or otherwise as to the conditions under which the work shall be performed, are not guaranteed by the Owner to be correct or to be a complete representation of all existing data on the conditions affecting the work.

E. The Contractor agrees that he has made his own examination and will make no claim for damages on account of any errors, inaccuracies, or omissions that may be found.

F. The Contractor shall not take any advantage or have any claim for damages on account of any discrepancy, error or omission in any plans, calculations, estimates of quantities, or any statements made in the Instructions to Bidders or otherwise as to the conditions under which the work is to be performed, and he shall report such discrepancy, error, or omission to the Owner in writing as soon as it comes to his knowledge, and before proceeding with work relating to such discrepancy, error, or omission.

G. Any correction of modification of the plans or specifications may be made by the Owner when necessary for the proper fulfillment of their purpose or for their proper interpretation. When there is a conflict between the plans and the specification, the Owner shall be the sole judge of which provision shall be controlling.

1.8 DEFINITIONS OR PARTIES REFERENCED IN SPECIFICATIONS

A. Project Identification: The name of the project is: Water Pollution Control Facility Flood Protection System Improvements, Town of Stratford, Connecticut.

B. The Project Owner is: The Town of Stratford, Connecticut.

C. The terms “Town,” “Owner,” and “Water Pollution Control Authority (WPCA)” shall all be considered synonymous for the purposes of reference only within this contract and shall refer to the Project Owner.

D. The terms “Engineers Consultant,” “Engineer,” “Engineering Consultant,” “Owner’s Consultant” and “Owner’s Representative” shall all be considered synonymous for the purposes of reference only within this contract and shall refer to the Project Design Engineer, GZA GeoEnvironmental, Inc.

PART 2. PRODUCTS

[NOT USED]

PART 3. EXECUTION

3.1 SUMMARY OF WORK

A. The Work required by the Contract Drawings and Specifications shall include furnishing all labor, skill, supervision, survey and layout, tools, construction plant, equipment, shoring and temporary excavation support, dewatering, temporary facilities, and materials and performing all operations necessary for the proper completion of the contract work as shown on the Contract Drawings and Specifications, and as required by the Owner and/or Engineering Consultant. The work shall generally consist of, but is not to be limited to, the following:

1. The Contractor must notify “CALL BEFORE YOU DIG CONNECTICUT” (811) at least three full working days prior to construction.
2. Provide and erect the Project Sign. Coordinate the location of the Project Sign with the Owner.
3. Mobilize to the site and deploy temporary sediment and erosion controls required for the project, including perimeter erosion and sediment control barriers, silt sacks, and other best management practices (BMPs).
4. Prepare construction staging and laydown areas and install stabilized construction entrances.
5. Notify the Owner, Engineer, and representatives from regulatory agencies having jurisdiction, of the construction schedule and conduct site walk to inspect sediment and erosion control measures. Modify sediment and erosion control measures as required. Work may proceed once approval has been granted from said entities.
6. Establish on-Site Survey Controls.
7. Perform utility clearance, locating, verification, protection, relocation, and coordination. Refer to Section 01100 for additional information and requirements.
    a. The Contractor shall exercise extreme caution to protect and avoid damage to any utilities or structures to remain in-place during construction and through project completion. The Contractor shall be responsible for any damage done to existing utilities, structures, and the site, or injuries to the public resulting from the Contractor's work or the work of the Contractor's subcontractors.
    b. The Contractor shall field locate and verify all existing utilities potentially affected by the work for service, status, type, size, invert, horizontal and vertical location, and any other pertinent information about such utilities, associated structures, and equipment prior to performing construction work in the vicinity thereof.
    c. The Contractor shall document the condition of existing subsurface utilities potentially affected by the proposed work by appropriate means and methods, including but not limited to exposure, direct observation, and measurement using test pits and minimally invasive excavation methods, where required and as necessary to avoid conflict with the proposed work, damage, injury, or service interruption potentially arising due to the Contractor’s work.
    d. The Contractor shall immediately notify the Owner and Engineer of any potential conflicts between existing utilities and the proposed Work prior to commencing construction.
    e. The Contractor shall be responsible for notifying and coordinating the proposed Work with the respective utility companies and appropriate municipal departments. Such coordination activities shall include, but are not limited to temporary or permanent relocations of pipe, conduit, equipment, poles, and other associated structures; inspections; service tie-ins and connections; and service interruptions as required, as indicated on the Contract Drawings, as necessary to perform the Work, and as directed by the Engineer or Owner.
    f. The Contractor is specifically informed of the presence of existing utility poles, guy wires and ground anchors, pole mounted equipment, and associated overhead electric, communications, and other utility lines at the project site. Notwithstanding the related project requirements, the Contractor shall be responsible for:
        1) Determining the required working clearances in accordance with OSHA regulations (“OSHA working clearances”).

2) Consulting and coordinating the work with the owners of potentially affected utilities.
3) Identifying and documenting all existing utility poles, guy wires and ground anchors, pole-mounted equipment, associated overhead utility lines, and appurtenances potentially affected by the work.
4) Coordinating and facilitating any action required by the affected utility owner's to enable the work. Such actions may include, but are not limited to:
   a) Temporary de-energization or other service interruption.
   b) Temporary protection.
   c) Pole, guy wire, ground anchor, and other equipment relocation.

g. Maintain continuous utility service to the Site except as approved in writing by the Owner.

8. Perform clearing and grubbing to the limits indicated on the Contract Drawings, as required, and as directed by the Engineer. Remove and dispose of all stumps, trees, shrubs, and related vegetative growth with the limits established on the Contract Drawings to allow access to work zones.

9. Strip topsoil from areas to be disturbed by the work and stockpile the topsoil on-Site for reuse.

10. Remove and replace existing 6-inch water service to the limits indicated on the Contract Drawings.

    a. Maintain continuous water service to the site, unless otherwise authorized in writing by the Town.

    b. Coordinate the service replacement, connections, and inspections with Aquarion Water Company (AWC), the Engineer, and the Town.

    c. Install the water service replacement such that it does not conflict with the proposed work and structures.

    d. Survey and document the location of the new service replacement and accurately depict the location on the record drawings.

    e. All work shall be performed by qualified personnel, in accordance with AWC and town requirements, as required, and as directed by the Engineer and or Town.

11. Temporarily remove and relocate existing revetment stone and riprap from the proposed areas of disturbance to the minimum extent necessary to perform the work. Excavate, separate, process, and store stone materials encountered during the work on-Site for suitable reuse in the Project.

12. Demolish, remove, and dispose of existing pavements, curbing, guide rail, fences and gates, abandoned utilities and other Site features within the footprint of and as necessary to perform the work, as indicated on the Contract Drawings, as required, and as directed by the Engineer.

    a. Plug and fill abandoned pipes to remain as indicated on the Contract Drawings.

    b. Excess materials, waste, and debris generated from demolition shall become the property of the Contractor and shall be handled, stored, removed, and disposed of in accordance with the Contract Documents, and applicable local, state, and federal law.

13. Excavate areas of proposed fill to expose the impervious fill subgrade, where it exists. The Contractor shall coordinate and provide reasonable notice and access for the assessment of the subgrade by the Engineer. The Engineer shall assess the suitability of the subgrade prior fill placement.

14. Install fill to proposed pile cap subgrade elevations or otherwise prepare the sites of the proposed pile-supported floodwall segments as required to facilitate pile installation.

    a. Partial installation of the proposed dike and floodwall embankment sections, including but not limited to impervious fill, stone and gravel bedding, base course, riprap, and stone-filled gabions may occur prior to pile installation at the Contractor's discretion.

    b. Provide and install suitable supplemental and imported materials as required.

15. Install piles and pile cap connections as required.

16. Excavate trench for pile cap key and prepare pile cap subgrade for concrete placement. Sequence the work with concrete placement.

    a. At near-grade utility crossings, modify the key and subgrade, and install compressible pipe gasket material over the pipe prior to concrete placement as required, as indicated on the Contract Drawings, and as directed by the Engineer.

17. Construct forms; steel reinforcing; expansion joints; water stops; embedded anchors, channels, plates, and connectors; and place concrete for floodwalls, keys, pile caps, stemwalls, and gate columns as required, as indicated on the Contract Drawings, and as directed by the Engineer.

    a. Place concrete for floodwall key, pile cap, and stemwall segments between consecutive expansion joints and gate columns monolithically, except where construction joints are used as indicated on the Contract Drawings.

    b. Except as specifically indicated on the Contract Drawings, vertical and horizontal construction joints shall not be used unless approved in writing by the Engineer.

    c. Place, finish and protect concrete as required, prior to stripping formwork and backfilling.

18. Install Underdrains as required and indicated on the Contract Drawings.

    a. Connect new underdrains to existing stormwater structures.

19. Install in-line tide check valve at the existing 15-inch diameter CMP stormwater pipe outfall on Beacon Point Road. Install the valve at the upstream end of the pipe that discharges into the Housatonic River as required, as indicated on the Contract Drawings, and as directed by the Engineer.

20. Construct earthen dike segments and complete floodwall embankment as required, as indicated on the Contract Drawings, and as directed by the Engineer.

    a. Reuse existing suitable fill materials to the maximum extent possible.

    b. Provide suitable supplemental and imported fill materials in sufficient quantities to complete the Work as required.

    c. Complete stone-filled gabion retaining wall installation. The stone-filled gabion retaining wall includes delegated design requirements by the Contractor.

    d. Raise and set the cover of the existing drainage structure on the 54" CMP drain line discharging to Diversion Chamber 'C' (west of proposed Wall-1) flush to finished grade.

    e. Reset existing revetment stone and install riprap slope protection and apron.

21. Install crushed stone pads for deployable flood gate component storage as required, per the storage unit manufacturer's recommendations, as indicated on the Contract Drawings, and as directed by the Engineer.

a. Excavate, shape, and compact subgrade as required. Final design and construction of the modular storage unit pads shall be determined by the Manufacturer.

b. Install a layer of woven geotextile over the compacted subgrade and the sidewalls of the excavation.

c. Place a minimum 12-inch-thick layer of crushed stone over the filter fabric and compact the crushed stone to a level, unyielding surface, flush to finished grade. Cut and remove excess woven geotextile to finished grade.

d. Provide and install the modular storage units on the crushed stone pads. The modular storage units and corresponding pads include delegated design requirements by the Contractor.

22. Provide, install, and test fit deployable flood gate systems.

a. The deployable flood gate systems include delegated design requirements by the Contractor.

b. After demonstrating the successful installation of the deployable flood gate systems, disassemble and store the components in their modular storage containers in accordance with the manufacturer's recommendations.

c. Provide required documentation, maintenance and training recommendations, owner's and operator's manuals, and system deployment instructions to the Owner and Engineer.

23. Modify, restore, and install new chain link fence and associated swing gates as required, as indicated on the Contract Drawings, and as directed by the Engineer.

24. Modify existing guide rail to remain on Beacon Point Road and install new terminal end sections as required, as indicated on the Contract Drawings, and as directed by the Engineer.

25. Restore existing pavements and install new hot mix asphalt (HMA) pavement and Bituminous Concrete Lip Curb (B.C.L.C.) at the locations indicated on the Contract Drawings and as required to restore unimproved areas of the Site disturbed by the work.

a. Proof-compact and fine-grade pavement subgrades prior to new pavement installation as required.

b. Saw-cut and prepare existing pavement and curb edges to provide a neat, vertical, and clean interface to receive new HMA pavement and B.C.L.C.

c. Install tack coat to pavement and curb edges and below new B.C.L.C. prior to placement of new HMA.

26. Complete backfilling, grade to proposed contours, and restore unimproved areas disturbed by the Work to match pre-construction conditions.

27. Replace and install topsoil, soil amendments, fertilizers, seed, and establish new turf as required (seed to lawn), as indicated on the Contract Drawings, and as directed by the Engineer or Owner.

a. Perform watering, protection, and maintenance to establish new turf as required.

28. Notify the Owner and Engineer of substantial completion of the Work.

a. Coordinate and attend a site inspection with the Owner, Engineer, and representatives of regulatory agencies having jurisdiction.

b. Develop a list of remaining work and incidental items, if any, to complete prior to final acceptance (punch list).

29. Complete punch list items.

30. Remove temporary sedimentation and erosion control measures, remove excess materials and waste generated by the Work, complete restoration, and demobilize from the Site.

31. Provide the Engineer and Owner with all project closeout documentation, as-built survey, site photographs, and certifications as required.

3.2 SERVICES PERFORMED BY THE ENGINEERING CONSULTANT

A. The Owner will employ an Engineer (Engineering Consultant, Owner's Representative) to perform full or part-time on-Site observation, documentation, and selected testing during all phases of Work. The services of the Engineering Consultant will include, but not be limited to, the following:

1. Attendance at construction meetings and site visits.

2. Observation of sedimentation and erosion control installation and maintenance.

3. Observation of Site survey controls, measurements, and layout for construction.

4. Observation of Site clearing and grubbing, stump removal, vegetation/tree clearing, and stripping and stockpiling of topsoil.

5. Observation of existing revetment and riprap stone removal and temporary on-Site relocation.

6. Observation of utility locating, verification, protection, and relocation.

7. Observation of demolition and utility abandonment.

8. Observation of excavation and dewatering.

9. Observation and assessment of subgrades.

10. Observation of backfilling and compaction operations.

11. Observation of riprap slope protection and apron installation.

12. Observation of pile foundation installation.

13. Observation of concrete formwork construction and reinforcing steel placement.

14. Observation of concrete placement, finishing, and curing.

15. Observation of deployable flood gate system test-fit installation and storage.

16. Observation of paving and curbing restoration.

17. Observation of turf establishment.

18. Development of punch list items.

19. Observation of site restoration and demobilization.

B. During the course of construction, the Engineering Consultant will advise the Owner and Contractor in writing, if at any time the work does not, in the opinion of the Engineering Consultant, conform to the plans and specifications.

C. The Owner's or Engineering Consultant's presence does not include supervision or direction of the actual work by the Contractor, his/her employees, or agents. Neither the presence of the Engineering Consultant or Owner, nor any observations and testing performed by him/her, or any notice or failure to give notice, shall excuse the Contractor from defects discovered in his/her work.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. No separate measurement or payment will be made for this section.

END OF SECTION

SECTION 01050

FIELD ENGINEERING

PART 1. GENERAL

1.1 GENERAL PROVISIONS

A. All work performed under this section of the specifications shall be subject to the General Conditions and Supplemental Conditions of the Contract.

1.2 SUMMARY

A. This section specifies the field engineering services required to be provided by the Contractor for the Project, including but not limited to:

1. Survey work.
2. Civil, structural, or other professional engineering services specified, or required to execute Contractor's construction methods.

B. The Contractor shall employ in-house personnel for day-to-day requirements and engage qualified professionals to perform critical layout aspects and as-built survey.

1.3 QUALIFICATIONS OF CONTRACTORS SURVEYOR AND ENGINEER

A. Contractor shall retain a land surveyor, licensed in the State of Connecticut, to layout and establish the critical lines and grades, elevations and locations of new construction and prepare the as-built plan.

B. Contractor shall retain a qualified, registered Professional Engineer (P.E.) licensed in the State of Connecticut, to prepare engineering design, analysis, calculations, shop drawings and related tasks as required.

C. Submit name and address of surveyor and professional engineer to the Engineering Consultant.

1.4 SURVEY REFERENCE POINTS

A. The basic horizontal control for this Project consists of a Stationed Control Reference Line or "Base Line" represented along the proposed floodwall, dike crest, and flood gates as shown on the Drawings. Stationing along the line is from 0+00 to 30+98.62. The coordinates of Station 0+00 and 30+98.62 coincide and are as follows:

Northing = 625177.2788 Easting = 896190.4558

(Horizontal Datum is referenced to the Connecticut State Plane of the North American Datum of 1983 in feet [NAD83, 2011]).

B. Elevations, in feet, are referenced to the North American Vertical Datum of 1988 (NAVD88).

C. Establish, locate, verify and protect horizontal and vertical controls prior to starting the Work, and preserve all permanent reference points during construction.

1. Make no changes or relocations without prior written notice to the Engineering Consultant.

2. Report to the Engineering Consultant when any reference point is lost or destroyed, or requires relocation because of necessary changes in grade or locations.

3. The Contractor's surveyor shall replace Project horizontal and vertical controls which may be destroyed and establish those replacements based on original survey control.

1.5 PROJECT SURVEY REQUIREMENTS

A. Establish a minimum of one permanent bench mark on-site, referenced to data established by survey control points.

1. Record locations, with horizontal and vertical data, on Project Record Documents.

B. Establish lines and levels, locate and lay out by instrumentation and similar appropriate means the following:

1. Site improvements.

a. Stakes for grading and fill placement, clearing and grubbing, etc.;

b. Extents of demolition and applicable elevations;

c. Extent of excavation, fill placement (dike and embankment crests, toe of slope, apron, etc.) and applicable elevations;

d. Extent of concrete floodwalls and flood gates and applicable elevations;

e. Extent of stone-filled gabion wall and applicable elevations;

f. Pile locations;

g. Existing, proposed, and as-built utility location references;

h. Extent of paving and curbing restoration and applicable elevations;

i. Extent of underdrains and applicable elevations;

j. Fence locations;

k. Extent of riprap placement and turf establishment.

2. Controlling lines and levels required to establish lines and grades depicted on the Contract Drawings.

C. From time to time, verify layouts by the same methods.

D. The Owner and Engineer shall be permitted to check all benchmarks, survey control points, lines and grades, layout, locations, and dimensions. The Contractor shall assist the Owner and Engineer with such checks as required.

1.6 RECORD DOCUMENTS

A. General: Maintain one complete record set of Documents at the site. Do not use Record Documents for construction purposes. Provide access to Record Documents for Engineering Consultant reference. Generally without limitation Record Documents shall include the following:

1. Record Drawings: Record Drawings shall consist of all the Contract Documents. Record Drawings shall be prepared for the entire project and shall include all work.

a. From the sets of Drawings furnished by the Owner, the Contractor shall reserve one set for record purposes.

b. The Contractor shall maintain a clean set of Contract Drawings and shop drawings updated weekly to show actual installation, locations, and notes.

c. Maintain a complete, accurate record of all control and survey work as it progresses.

d. Accurately depict any deviations from the Contract Drawings.

e. Give particular attention to concealed items and buried utilities. Accurately indicate the locations of buried utility crossings horizontally and vertically below the proposed floodwalls, dikes, and embankments.

2. Record Project Manual: Maintain a clean Project Manual, including Addenda, Change Orders, and other modifications, updated weekly to show changes in the actual work performed. Give particular attention to substitutions, selection of options, and similar information.

3. Record Submittals, Samples, and Product Data: Maintain one copy of each reviewed submittal, sample and product data record updated weekly to show changes from products delivered, work performed, and from manufacturer's recommended installation instructions.

4. Record Field Test Reports: Maintain one copy of each Field Test Report.

5. Daily Progress Reports: Maintain one copy of each Daily Progress Report.

B. Final As-Built Survey: At the conclusion of the Work, the Contractor's Connecticut-licensed surveyor shall perform an As-Built conditions survey of the project site including, but not necessarily limited to as-built grades, dimensions, limits, extent and elevations associated with the flood protection system improvement and crests, toe of slope, aprons, pile caps, stemwalls, flood gate elements and deployable storage, guide rail, fences, riprap slope protection, underdrains, utility crossings, and other pertinent locations within the limits of disturbance or otherwise affected the Contractor's work as required.

C. Final Record Drawings: The Owner will provide the Contractor with a set of Contract Drawing files in AutoCAD format to use as a base for the Final Record Drawings. The Contractor's final Record Drawings shall include an as-built conditions survey (stamped by a surveyor licensed in the State of Connecticut). The Contractor shall be responsible for transferring the Contractor's and their subcontractors' as-built notations to the computer files. The computer drafting work shall be done by an experienced AutoCAD draftsperson and shall be consistent with the layering and conventions used on the Contract Drawing files.

D. Prior to the Owner releasing final payment, the Contractor shall deliver Record Documents to the Engineering Consultant as follows:

1. Updated electronic file.

2. One (1) set of black line prints from the updated electronic file.

3. Each of the above shall be clearly marked "RECORD DRAWING" and bear the date of printing.

PART 2. PRODUCTS

[Not Used.]

PART 3. EXECUTION

[Not Used.]

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. There shall be no separate measurement or payment made for this Section. Compensation shall be included in the prices stipulated on the numbered items on the Bid Form.

B. Compensation for completion of the required Record Documents, As-Built Survey, and Final Record Drawings shall be included in the Payment Items of Section 01900 – Mobilization/Demobilization, per specified schedule of payment, or as modified per the Contractor's Schedule of Values accepted in writing by the Owner.

END OF SECTION

SECTION 01060

REGULATORY REQUIREMENTS

PART 1. GENERAL

1.1 PERMITS AND LICENSES

A. No portion of the Work within and/or adjacent to the Housatonic River, or adjacent to existing resource areas shall be begun until all necessary and required permits have been secured.

B. The following permits, notifications, and/or approvals have been applied for by the Owner and are expected to be issued prior to start of construction:
- Town of Stratford: Connecticut Inland Wetlands & Watercourses (IWWC) Permit
- Town of Stratford: Coastal Site Plan and Erosion and Sediment Control Plan Review
- CT DEEP: Dam Safety Construction Permit (CGS Sec. 22a-403)
- CT DEEP: NDDB Determination Letter – New Determination Number: 202302737
- CT DEEP: Flood Management Certification (License No. 202203630-FM)
- Federal Emergency Management Agency (FEMA) Record of Environmental Consideration (REC)

C. If not already attached herein to this Section, copies of those permits/approvals outstanding as of the bids due date will be forwarded to the Contractor by addendum after they have been issued by the permitting agencies. These permits/approvals are to be considered as part of the Contract Documents. The Contractor shall be responsible for adhering to the conditions stipulated in all permits/approvals. No Work shall begin until all required permits have been secured to cover the Work.

D. The Terms and Conditions which will accompany the required permits, licenses, and approvals still to be issued are not expected to deviate substantially from the requirements of these Contract Documents and the Technical Specifications. No additional payment shall be made for adherence to the terms and conditions of permits, licenses, and approvals yet to be issued for the Project. In the event that compliance with terms and conditions of a permit (applied for by the Owner) requires substantial additional work on the part of the Contractor, a Contract Amendment will be negotiated. No additional payment will be made in any event for compliance with permits obtained by the Contractor.

E. A temporary permit (local) may be required for field trailers or other temporary facilities and, if required, shall be obtained by Contractor. Copies of all required permits and licenses shall be forwarded to the Owner prior to the beginning of the Work. The Contractor shall be responsible for conducting his/her work in accordance to all provisions of said permits.

F. The Contractor shall procure all other required permits and licenses, pay all charges, fees and taxes and shall give all notices necessary and incidental to the due and lawful prosecution of the work under this Contract. The cost thereof shall be included in the prices bid for the various items specified herein for the work of this Contract. Copies of all required permits and licenses shall be filed with the Engineer prior to the beginning of the work.

G. The disturbance area at the site will be less than five acres in total, received local approval, and is therefore not under the jurisdiction of the NPDES general construction permit process. Regardless of the need for a Stormwater Pollution Prevention Plan (SWPPP) under the NPDES permit, the Contractor shall be responsible for sediment and erosion control at the site. The Contractor shall incorporate Best Management Practices (BMPs) shown on the Contract Drawings and other applicable Specifications;

however, it shall be understood that these measures called for in the specifications and on the plans represent the **MINIMUM** acceptable level of sediment and erosion control.

1.2 ADHERENCE TO AUTHORIZATIONS, PERMIT AND LICENSE CONDITIONS AND REQUIREMENTS

A. The Contractor shall strictly adhere to all conditions and requirements set forth in the authorizations, permits, licenses, etc. issued in relation to the Work of this Contract. The Contractor shall undertake all incidental work necessary to meet the conditions and requirements of the authorizations, permits and licenses and shall perform the Work of the Contract in accord with said conditions and requirements. The cost thereof shall be included in the prices bid for the various items specified herein for the work of this Contract.

B. The Contractor shall be solely responsible for monitoring and complying with the conditions and requirements of all authorizations, permits and licenses. The Contractor shall solely be responsible for any and all penalties, sanctions, and fines that result from non-compliance with the conditions and requirements of all authorizations, permits and licenses. The Contractor shall be aware that the attached Contract Drawings are a key condition of the permits granted by the Town of Stratford and CT DEEP. Deviation from the Contract Drawings shall not be made without permission of the Resident Engineer and Owner, and consent of regulatory authorities. Neither the Owner nor the Engineer will be held responsible for any penalties which result from Contractor violations of the conditions and requirements of authorizations, permits and licenses.

C. No additional payment will be made for compliance with the conditions and requirements of the authorizations, permits, variances, or approvals.

D. Copies of all permits shall be maintained at the site by the Contractor during the Work.

1.3 AIR, SOIL, AND WATER POLLUTION AND NOISE CONTROL

A. The Contractor shall comply with the applicable local, state, and federal regulations pertaining to Open Burning, and Dust, Odor, Construction and Demolition; and his/her attention is called to applicable Enforcement Provisions in regard to these and other pertinent and applicable regulations. The Contractor shall comply with the provisions of the Clean Air Act of 1970, 42USC, Sections 1857- 1857f.

B. A Sediment and Erosion Control plan and notes are included within the Contract Drawings. The information contained in the plans, specifications, and notes may be used as the basis for the preparation of any sediment and erosion control plan, but shall be considered the **MINIMUM** acceptable measures. The final content and the responsibility for implementation are the Contractor's alone.

C. The work of this contract is being conducted adjacent to the Housatonic River and inland and coastal wetlands at and around the Owner's site. The Housatonic River and its surrounding wetlands are sensitive water resources which provides habitat for fish and other wildlife. The Contractor shall take every precaution to prevent the chemical contamination of soil, groundwater, surface water caused by spilling or leaking of oil, hazardous material, or other chemicals and materials used in the construction operation. The Contractor shall be especially careful not to discharge or spill any oil, grout, concrete, or other contaminants in or onto the waters adjacent to and/or within work areas.

D. Clean-up of such spills, leaks or other contamination shall be undertaken immediately by the Contractor. The clean-up work shall be done to the satisfaction of the Engineer and Owner. All spills, leaks, or other contamination shall be immediately reported to both the Engineer and Owner. In the event that such a spill or leak is not cleaned up by the Contractor, the Owner reserves the right to have the spill or leak

cleaned up by its own forces or by others and the expense of such removal and disposal will be charged to the Contractor.

1.4 HEALTH AND SAFETY

A. The Contractor shall be responsible for complying with all local, state, and Federal laws, codes, ordinances, rules, requirements, standards, regulations, and orders governing workplace and site health and safety. Health and Safety on the project site shall be the sole responsibility of the Contractor. The Contractor shall be responsible for monitoring the health and safety practices of his own personnel and those of all sub-contractors present on the site. The Contractor shall be responsible for knowledge of and compliance with all relevant OSHA regulations, as well as all other Federal, state, and local laws, ordinances, codes, and regulations pertaining to health and safety.

B. A site-specific Health and Safety Plan (HASP) must be in place prior to the Start of the Work. The Contractor is hereby notified that Owner shall place the utmost importance on the proper planning, execution and adherence to the HASP and all required general safety procedures. Review of this plan by Owner and/or its Consultant in no way implies acceptance of responsibility for job site safety by the Owner and/or its Consultant. The Contractor shall be solely responsible for job site safety.

C. The site-specific HASP shall specifically address fall protection, water safety, and traffic safety, as well as all other areas deemed necessary by the Contractor.

D. Neither the professional activities of Owner, its Engineer, or its Consultant, nor the presence of the Owner, its Engineer, or its Consultant's employees and/or subcontractors will be construed by any party to imply that the Owner, its Engineer, or its Consultant has any responsibility for any Contractor's methods of work performance, procedures, superintendence, sequencing of operations, or safety in, on or about the project site. With respect to site safety, the Owner and Engineer will be responsible solely for the on-site activities of their own employees and this responsibility will not be construed to relieve the Contractor from its obligations to maintain a safe project site.

1.5 SUBMITTALS

A. The Contractor shall submit the following documents a minimum of five (5) days prior to the start of work:

1. Health and Safety Plan (HASP) - **FOR INFORMATION ONLY**

PART 2. PRODUCTS

[Not used]

PART 3. EXECUTION

[Not used]

PART 4. MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for this section.

Attachment A1 - Regulatory authorization documents received as of date of specification preparation:
Town of Stratford: Connecticut Inland Wetlands & Watercourses (IWWC) Permit #2013-13
Town of Stratford: Coastal Site Plan Review Letter
Town of Stratford: Erosion and Sediment Control Plan Review Letter
CT DEEP: Dam Safety Permit No. DS-202409162
CT DEEP: NDDB Determination Letter – New Determination Number: 202302737

CT DEEP: Flood Management Certification (License No. 202203630-FM)
FEMA: REC for Project PDMC-PJ-010CT-2017-006 (0)

END OF SECTION

SECTION 01100
SPECIAL PROVISIONS

PART 1. GENERAL

1.1 GENERAL OBLIGATIONS OF THE CONTRACTOR

A. General obligations of the Contractor shall be as set forth in the Contract Documents. Unless special payment is specifically provided in the Bid Form, all incidental work and expense in connection with the completion of work under the Contract will be considered a subsidiary obligation of the Contractor and all such costs shall be included in the appropriate item in the Bid Form in connection with which the costs are incurred.

B. Refer to Specification Section 01010 Summary of Work for additional requirements regarding special provisions.

1.2 SITE INVESTIGATION

A. The Contractor shall satisfy himself/herself as to the conditions existing within the project area, the type of equipment required to perform the work, the character, quality and quantity of the subsurface materials to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, as well as from information presented by the Drawings and related Sections. Any failure of the Contractor to acquaint himself/herself with the available information will not relieve him/her from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusions or interpretation made by the Contractor on the basis of the information made available by the Owner.

1.3 COORDINATION WITH LOCAL AGENCIES

A. Supply the Owner with the following information.

1. Areas where approved detours or other traffic management measures are in effect.
2. Immediate notification of any sewer, drain, gas, electric, water or other utility breaks.
3. Immediate notification of any damage to the WPCF property, outlets, or other appurtenant structures that could result in a sudden uncontrolled release of wastewater from the WPCF to the Housatonic River or other resources.

1.4 PUBLIC AND PRIVATE UTILITIES

A. General

1. The utilities shown on the Contract Drawings are for reference only and in no way indicate exact locations or conditions.
2. The utilities shown on the Contract Drawings represent a composite of information collected and reviewed by the Engineer. Actual conditions may vary. It is also unknown if other utilities exist at the Site. Copies of documents used for reference in the development of the utility representations indicated on the Contract Drawings are included in **Attachment A3**.
3. The Contractor shall be responsible for notifying and coordinating the proposed Work with the respective utility companies and appropriate municipal departments. Such coordination activities shall include but are not limited to locating and verification; temporary or permanent relocations

of pipe, conduit, equipment, poles, and other associated structures; inspections; service tie-ins and connections; and service interruptions as required, as indicated on the Contract Drawings, as necessary to perform the Work, and as directed by the Engineer or Owner.

4. The Contractor is specifically informed of the presence of existing utility poles, guy wires and ground anchors, pole mounted equipment, and associated overhead electric, communications, and other utility lines at the project site. Notwithstanding the related project requirements, the Contractor shall be responsible for:

   a. Determining the required working clearances in accordance with the utility owner and OSHA regulations ("OSHA working clearances").

   b. Consulting and coordinating the work with the owners of potentially affected utilities.

   c. Identifying and documenting all existing utility poles, guy wires and ground anchors, pole-mounted equipment, associated overhead utility lines, and appurtenances potentially affected by the work.

   d. Coordinating and facilitating any action required by the affected utility owners to enable the work. Such actions may include, but are not limited to:
      1) Temporary de-energization or other service interruption.
      2) Temporary protection.
      3) Pole, guy wire, ground anchor, and other equipment relocation.

B. Call Before You Dig

1. Notify Call Before You Dig (CBYD) at 1-800-922-4455; or 811; or via E-Ticket submission at www.cbyd.com at least 72 hours before digging, trenching, blasting, demolishing, boring, grading, landscaping, or other earth moving operations at the Site, and in any public ways, rights of way, and easements.

C. Utility Conflicts - General

1. Relocations of existing utilities are required to address potential conflicts with the proposed work. Where the relocation can be performed by the Contractor's forces, the Work shall be performed in a timely manner to avoid delays. Where the relocation of the utility must be performed by others, the Contractor shall coordinate this work with the utility company and make all arrangements with the utility company with respect to relocating their utilities and schedule his work to avoid any delays. This may require moving the operation to another portion of the work. The Contractor shall have no claim for delay associated with addressing utility relocations.

2. The Contractor shall exercise extreme caution when excavating or performing other construction work in the vicinity of utility structures and equipment to avoid any damage. The Contractor shall be responsible for coordinating and scheduling all aspects of work required by utilities during construction, including the relocation, the protection and the support of utility infrastructures.

3. Any damage to the utility structures and equipment that is a result of the Contractor's actions shall be the responsibility of the Contractor.

4. During the Construction of this project, other Utility Companies including AWC, UI, SCG, etc., may have their contractors working within the limits of this project for removing and installing utilities. The Contractor shall be responsible for coordinating his work with other contractors working within the limits of the project.

5. Comply with requirements of utility companies when working in the area of their utilities.

6. The Work includes the limited removal, relocation, and replacement of an existing water service line that crosses the proposed flood protection system improvements (below-grade).

    a. The Contractor shall be responsible for verifying the new relocated water service line does not present a conflict with any other Work of the Contract, such as pile locations. The Contractor shall immediately notify the Engineer and Owner of any conditions which may conflict with the Work as indicated on the Contract Drawings. If, in the opinion of the Engineer, a design modification of the proposed flood protection system elements is necessary to avoid conflict with the water service line, the Contractor shall assist the Engineer with investigations, measurements, and other data collection necessary to inform such a modification.

    b. The Contractor shall be responsible for documenting the condition and location of the new relocated service line and including this information on the Record Drawings, as required.

    c. Refer to the Contract Drawings; Specification Sections 01010, 01050, 02300, 02660, 02665, 02760; and related Sections for applicable requirements.

D. Storm Drains; Sanitary Sewer; Water, Gas, Telecommunications, Fiber Optic, and Electrical Services; WPCF Plant Process, Intake, Effluent, Tanks, and Yard Piping and Structures; Hydrants; Stand Pipes; Site Lighting; Overhead Utilities; and other Utility Structures, Controls, Services, and Equipment.

1. Not all of the utilities potentially present at the Site are shown on the Contract Drawings. The Contractor shall have all services, pipes, conduits, structures, poles, and related equipment located prior to making any excavation or other activity below grade in the vicinity thereof, including but not limited to drilling and pile installation. All services shall be protected from damage, and shall be reconnected or be repaired by the Contractor at no additional cost to the Owner.

2. The Contractor shall pay particular attention to safety issues and construction conflicts relating to electrical facilities, both overhead and underground. Certain utility poles, guy lines and anchors, other buried and above-grade equipment and structures, and overhead lines may require relocation, modifications, or other measures to enable the Work.

3. The Work includes the limited removal, relocation, and replacement of an existing water service line that crosses the proposed flood protection system improvements (below-grade).

4. The Work includes other specified measures for the abandonment of pipes. Refer to the Contract Drawings; Specification Sections 01010, 01050, 02300, 02660, 02665; and related Sections for applicable requirements.

1.5 SUBSURFACE UTILITY LOCATING

A. The intent of this work is to provide the Engineer and Contractor with reliable utility location data to the accuracy and precision necessary to further assess potential conflicts with existing utilities. If necessary, in the opinion of the Engineer, the utility location data may be used to resolve latent conflicts and accommodate typical and project-specific tolerances associated with the proposed construction, especially pile installation and excavation. The Contractor shall be responsible for the development of work plans, specific tasks, methods, and procedures necessary to perform the work and provide the required information.

B. The Contractor shall perform subsurface utility locating work in accordance with CI/ASCE 38-02: "Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data" (ASCE 38-02), except as may be modified or specified herein.

C. The Contractor shall field locate and verify the conditions of all existing utilities potentially affected by the work and document and submit the minimum required information for each utility prior to performing construction work in the vicinity thereof. The minimum required utility location information includes:

1. Status (active, inactive, abandoned, etc.);
2. Size (and other applicable dimensions or shape characteristics as necessary to fulfill the intent of the work);
3. Material(s);
4. Utility Type (electric, water, gas, sewer, drain, etc.);
5. Vertical Location: elevation to the top of the utility in feet (reference datum NAVD88), accurate to the tenth (0.0') or greater precision, as required to verify adequate vertical clearance exists between the existing utility and proposed structural elements;
6. Horizontal Location: horizontal position and extents (coordinates) of the utility in Connecticut State Plane, Mainland Zone, US Feet (NAD83, 2011), and accurate to the tenth (0.0') or greater precision, as required to verify adequate horizontal clearance exists between the existing utility and proposed structural elements;
7. Specifically identify any inverts, fittings, elbows, controls, meters, valves, restraints, appurtenances, encasement, and other relevant configuration details that potentially affect or inform the proposed work (multiple line configurations shall be located separately if not encased within the same conduit);
8. Date(s) of measurement;
9. Other pertinent information about each utility and its condition.

D. The Contractor shall obtain and submit the minimum required utility location information to the Engineer continuously throughout the project duration as the information becomes available.

E. The Contractor shall access, measure, and otherwise document the condition and location of existing utilities potentially affected by the proposed work by appropriate means and methods, including but not limited to physical exposure, direct observation, and measurement using test pits and minimally invasive excavation methods, where required and as necessary to avoid conflict with the proposed work, damage, injury, or service interruption potentially arising due to the Contractor's work. The Contractor may utilize geophysical methods (e.g., EM, GPR, etc.) to support their proposed means and methods. However, the Contractor is advised that typical geophysical methods alone may not be suitable to accomplish the utility locating work as required.

F. The Contractor is advised that the level of effort necessary to locate each utility as required may vary. Should the Contractor find that their proposed means and methods are not adequate to complete the utility locating work as required, they shall immediately notify the Owner and Engineer and deploy alternative suitable means and methods as necessary to perform the work as required at no additional cost to the Owner.

G. Test pits and minimally invasive excavations for the purpose of locating underground pipelines, structures, and other types of buried equipment in advance of the construction shall be excavated and backfilled in accordance with Section 02300. Test pits and minimally invasive excavations shall be properly backfilled immediately after their purpose has been satisfied and the surface restored and maintained, as specified in Section 02300.

H. Test pits shall be as small as possible while maintaining worker safety. Hand excavation and/or other soft digging methods, such as vacuum and hydro-vac excavation, will be required within two feet of any utility.

I. Submittals:

1. Prior to beginning any subsurface construction work, the Contractor shall prepare and submit a proposed Utility Locating Work Plan for review by the Town and Engineer. No subsurface work shall occur before the Contractor has received written notice of the Town's acceptance of the Contractor's proposed Utility Locating Work Plan. The Utility Locating Work Plan submittal shall include the following minimum information:

   a. A narrative description of the Contractor's proposed means, methods, and procedural approach to identifying and locating the subsurface utilities, as required.

   b. Proposed locations of access and locating work (indicated on a Site plan).

   c. Proposed typical and specialized equipment with technical specifications.

   d. Anticipated schedule, duration, and phasing (if any).

   e. Proposed Subcontractors (if any).

   f. Proposed coordination with utility owners and others.

2. The Contractor shall submit the required utility location information to the Engineer continuously throughout the project duration as the information becomes available.

3. The Contractor shall include all required utility location information on the Record Drawings, Final Record Drawings, and other applicable Record Documents. Refer to Specification Section 01050 Field Engineering for related Record Document Requirements.

1.6 PERMITS

A. The Contractor shall obtain all necessary permits required for proper execution of the project. Fill out all forms and furnish all drawings required to obtain the permits. A copy of each permit shall be submitted to the Owner. All fees associated with these permits shall be paid by the Contractor as part of the work. Work shall not commence on any phase of the work requiring a permit until the permit is obtained. Refer to Section 01060 for more information related to permits and requirements.

B. Where required, the Contractor shall obtain required street opening permits for excavations within streets or sidewalk areas.

PART 2. PRODUCTS

[Not Used]

PART 3. EXECUTION

[Not Used]

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Measurement and payment for Contract Item 01100.1 UTILITY COORDINATION, LOCATING, CLEARANCE, AND VERIFICATION shall be made at the lump sum contract unit price for the proportion of the utility coordination, locating, clearance, and verification work satisfactorily complete. This price shall include full compensation for all survey; supervision; equipment; labor; materials; pre-marking and re-marking utilities throughout the work; access; excavation, exposure, direct measurement, and observation; backfilling; field verification, measurement, and documentation; geophysical survey methods; "Call-Before-You-Dig"; coordination with utility companies, Owner, Engineer, and other local agencies, as applicable; cleanup; submittals; and preparation and submittal of findings of utility locating efforts; and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

B. There shall be no separate measurement and payment for the other work of this Section including but not limited to permits, utility coordination, coordination with local agencies, Contractor's site investigations, and other incidental work. Compensation for such work shall be included in the payment items for which the incidental work is required or Section 01900 Mobilization/Demobilization.

4.2 PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
01100.1	UTILITY COORDINATION, LOCATING, CLEARANCE, AND VERIFICATION	LUMP SUM

END OF SECTION

SECTION 01110
ENVIRONMENTAL PROTECTION PROCEDURES

PART 1. GENERAL

1.1 SCOPE OF WORK

A. The work covered by this Section consists of furnishing all labor, materials and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during, and as the result of construction operations under this Contract. For the purpose of this Specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; or degrade the utility of the environment for aesthetic and recreational purposes.

B. The control of environmental pollution requires consideration of air, water and land, and involves management of noise and solid waste, as well as other pollutants.

C. Schedule and conduct work in a manner that will minimize the erosion of soils in the area of the work and mitigate siltation to reservoirs, rivers, wetlands, and water courses. Provide erosion control measures such as diversion channels, sedimentation or filtration systems, berms, staked straw bales, silt sacks, silt fencing, erosion control socks, erosion control blankets and seeding, mulching or other special surface treatments as required to prevent silting and muddying of stormwater receptors, streams, rivers, impoundments, etc. All erosion control measures shall be in place in an area prior to any construction activity in that area.

D. The Contractor shall comply with all regulatory authorizations, permits, licenses, conditions, and associated requirements applicable to this Project. Refer to Section 01060 Regulatory Requirements for additional information.

E. These Specifications are intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings.

1.2 RELATED WORK

A. The following is a list of related work items that shall be performed or furnished under other sections of these specifications as indicated:

Section 01010 – Summary of Work

Section 01060 – Regulatory Requirements

Section 01100 – Special Provisions

Section 01500 – Temporary Facilities and Controls

Section 01560 – Temporary Erosion and Sedimentation Controls

Section 01740 – Site Restoration

Section 01900 – Mobilization and Demobilization

Section 02065 – Demolition, Removal, and Disposal

Section 02110 – Clearing, Grubbing, and Stripping

Section 02300 – Earthwork

Section 02319 – Temporary Water Control

1.3 APPLICABLE REGULATIONS

A. Comply with all applicable Federal, State and local laws and regulations concerning environmental pollutant control and abatement.

B. Secure all applicable construction related permits not already secured by the Owner or its Design Engineer.

C. The Contractor shall be responsible for identifying all required permits for the work covered under this Contract.

D. At a minimum, comply with requirements set forth by the US Environmental Protection Agency, US Army Corps of Engineers, Connecticut Department of Energy & Environmental Protection, and any Local authorities.

1.4 IMPLEMENTATION

A. Prior to commencement of the work meet with the Owner to develop mutual understanding relative to compliance with these provisions and administration of the environmental pollution control program. Furnish to the Owner detailed plans, specifications, calculations, and other information as may be required to clearly show Contractor's proposed methods for meeting the requirements of these Specifications.

B. Remove temporary environmental control features as needed and incorporate permanent control features into the project at the earliest practicable time.

C. Compliance with the provisions of this Section by subcontractors shall be the responsibility of the Contractor.

PART 2. PRODUCTS

2.1 MATERIALS

A. Refer to Sections listed under Related Work of this Section.

PART 3. EXECUTION

3.1 EROSION CONTROL

A. Comply with all applicable regulatory requirements and permit conditions.

B. Refer to Section 01560 Temporary Erosion and Sediment Controls and the Contract Drawings for additional information.

C. Provide positive means of erosion control such as shallow ditches around construction areas to carry off surface water. Water shall be diverted to channels upstream of siltation barriers. Flow of surface water into excavated areas shall be prevented. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.

D. Sufficient precautions shall be taken during construction to minimize the run-off of polluting substances such as silt, clay, fuels, oils, bitumens, calcium chloride, or other polluting materials harmful to humans, fish, or other life, into the supplies and surface waters of the State. Control measures must be adequate to assure that turbidity in the receiving water will not be increased more than 10 Formazin Turbidity Units (FTU), or as otherwise required by the State or other controlling body, in waters used for public water supply or fish unless limits have been established for the particular water. In surface water used for other purposes, the turbidity must not exceed 25 FTU. Special precautions shall be taken in the use of construction equipment to prevent operations which promote erosion. In cross-slope areas when excavating in wetlands or flood plain, the excavated material shall be placed on the uphill side of the trench so that the trench serves as a barrier between the excavated material and the wetland or flood plain.

3.2 PROTECTION OF STREAMS

A. Care should be taken to prevent, or reduce to a minimum, any damage to any stream from pollution by debris, sediment or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream shall not be directly returned to the stream. Such waters shall be diverted through a settling basin, filter, or other treatment process as may be appropriate and as directed by the Owner before being directed into the streams.

B. Do not discharge water from dewatering operations directly into any live or intermittent stream, river, channel, wetlands, surface water or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.

C. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action should be taken in accordance with the Contractor's contingency action plan.

3.3 PROTECTION OF LAND RESOURCES

A. It is intended that the land resources within the project boundaries and outside the limits of permanent work performed under this Contract be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of the project. Insofar as possible, confine construction activities to areas shown on the Drawings.

B. Except within areas bounded by construction easement lines as shown on the Drawings, do not deface, injure, or destroy trees or shrubs, nor remove or cut them without special authority. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Owner. Where such special emergency use is permitted, first adequately wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any

rope, cable, or wire is placed. The Contractor shall be responsible for any damage resulting from such use.

C. Where trees not scheduled for removal may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment or by dumping or other operations, protect adequately such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.

D. The location of the Contractor's storage, and other construction facilities, required temporarily in the performance of the work, shall be upon cleared portions of the job site and shall require written approval of the Owner. The preservation of the landscape shall be an imperative consideration of buildings. Plans showing storage facilities shall be submitted for review and approval of the Owner.

E. Eliminate all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other vestiges of construction as directed by the Owner. Excavation, filling, and plowing of roadways and other construction access areas will be required to restore the areas to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas for which another finish treatment (e.g., riprap slope protection, pavement, gravel, etc.) is not specified shall be prepared and seeded as described in Section 02930, or as approved by the Owner.

F. All debris and excess material shall be disposed of outside wetland or floodplain areas in an environmentally sound manner.

3.4 PROTECTION OF AIR RESOURCES

A. Burning at the project site for the disposal of refuse, debris or other materials is not allowed.

B. Maintain all excavations, embankments, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or outside the project boundaries free from dust which would cause a hazard or nuisance to others.

C. Approved temporary stabilization methods consisting of sprinkling, chemical treatment, light bituminous treatment or similar methods will be permitted to control dust.

D. Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs.

E. Maintain equipment, including mufflers and air pollution control devices, and keep them all in proper working order.

3.5 NOISE CONTROL

A. Make every effort to minimize noises caused by the construction operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with Federal and State regulations.

3.6 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

A. During the life of this Contract maintain all facilities constructed for pollution control under this Contract as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

3.7 PROTECTION OF WETLANDS

A. The following specifications shall apply within and adjacent to the wetland limits shown on the Drawings, as well as any additional area determined by the Owner.

B. Material excavation from the Work shall be stockpiled on the upland side.

C. Wetland topsoil shall be separated from remainder of excavated material and used in the restoration of the surface of the excavated area. The surface shall be restored to pre-construction elevation. No mound shall be created, nor shall fill be placed on the surface.

D. No loaming, seeding, or turf establishment will be permitted in wetland areas unless there is a shortage of stockpiled wetland topsoil.

E. Construction of new access roads in wetland areas is prohibited.

F. Storage of equipment, construction material, or excavation material in wetland areas is prohibited except as required for completion of work within wetlands.

3.8 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 legally dispose of any contaminated earth off-site, and replace with suitable compacted fill and topsoil.

C. Care shall be taken to prevent, or reduce to a minimum, damage to any water resource from pollution by debris, sediment or other material, or from the manipulation of equipment and/or materials in or near such waters. Water that has been used for washing or processing, or that contains oils or sediments that will reduce water quality shall be diverted through a settling basin or filter before being discharged.

D. No materials shall be dispersed or stockpiled in any wetland area. No excavated materials or materials to be used in backfilling shall be deposited within 100 feet of any watercourse, wetland area, or drainage facility without prior approval from the Owner and regulatory agencies.

E. The storage of fuel oil and refueling of equipment shall be restricted to designated areas approved by the Owner and appropriate regulatory agencies.

F. Contractor shall not locate his storage of equipment and materials within 100 feet of wetland boundaries, floodplains, or water supply reservoirs.

G. All debris and excess material will be disposed of outside the boundaries of wetland or floodplain areas in an environmentally sound manner as determined by the federal, state, and local regulations.

H. 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.

2. Provide systems for control of atmospheric pollutants.

3. Prevent toxic concentrations of chemicals.

4. Prevent harmful dispersal of pollutants into the atmosphere.

I. All Contractor's equipment used during construction shall conform to all current federal, state and local laws and regulations.

3.9 SIGNIFICANTLY IMPORTANT ARCHAEOLOGICAL AREAS

A. For the Contractor's information, the Owner has no information suggesting that the Project site is of archaeological significance.

B. Should the Contractor or Owner discover evidence of remains or other items of archaeological significance, Contractor shall report these findings to the local police department, and shall exercise the utmost care to ensure that these areas remain undisturbed. Contractor shall allow recovery of such finds by the authorities, shall not remove such artifacts under penalty of law, and shall prevent construction or private vehicles from crossing over these areas. In addition, when directed by the Owner, cover these areas with a 1-foot thickness of common fill to the limits directed by the Owner. Refer to Specification Section 01010 – Summary of Work for additional requirements regarding archeological finds.

3.10 PROTECTION OF STATE ENDANGERED, THREATENED, OR SPECIAL CONCERN SPECIES

A. The Contractor is advised that Connecticut Department of Energy & Environmental Protection (CT DEEP) has determined that implementation of best management practices (BMPs) is required for the protection of the Eastern Box Turtle, Terrapene c. carolina, if conducting work between April 1st and November 1st. Refer to **Condition 16** of the Dam Safety Permit and NDDB Determination Letter included in **Attachment A1** for additional information.

B. A qualified herpetologist/biologist shall be hired by the Owner to oversee the implementation of Eastern box turtle protection measures and procedures for the duration of the project construction. The Contractor shall be responsible for the implementation of required BMPs and compliance with the associated permit conditions. If conducting work between April 1st and November 1st, the Contractor shall be required, at minimum, to:

1. Provide the herpetologist/biologist with reasonable notice of planned work activities affected by the Eastern Box Turtle protection requirements and related permit conditions.

2. Attend mandatory on-site training and education provided by the herpetologist/biologist to apprise the Contractor's personnel working within Eastern Box Turtle habitat of the species description and possible presence. The Contractor shall make reasonable efforts to coordinate timely scheduling of the on-site training and education with the herpetologist/biologist. All construction personnel and work crews shall be apprised of the species descriptions and possible presence.

3. Install and maintain exclusion fencing, prior to the start of construction, around the work area to prevent turtle access to the work area. The exclusion fencing must be at least 20 inches tall and must be secured to and remain in contact with the ground. Silt fencing installed for erosion control may serve this like purpose. Refer to Section 01560 Temporary Erosion and Sediment Controls and the Contract Drawings for additional Silt Fence requirements.

    a. The work area includes all areas used for site access, equipment parking, material staging, material storage, and construction purposes.

    b. The Contractor shall inspect the exclusion fencing each day prior to the start of work activities. The Contractor shall immediately fix or repair any gap or breach in the exclusion fencing.

4. Search for turtles within the work area each workday prior to the start of any work activities.

    a. If any turtles that are encountered within the limits of the work area, the turtles shall be carefully moved by the Contractor, unharmed, to an area immediately outside of the fenced work area and shall be released oriented to head in the same direction as found.

5. Remove all exclusion fencing immediately after the completion of construction activities and prior to demobilization.

6. Remove all soil erosion control fencing as soon as soil stabilization is completed.

7. Comply with the requirements and conditions of all regulatory permits, licenses, and other authorizations obtained for this Project.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. No separate measurement or payment will be made for this section.

END OF SECTION

SECTION 01200

PROJECT COORDINATION AND MEETINGS

PART 1. GENERAL

1.1 SUMMARY

A. The Contractor shall attend meetings prior to and during execution of the Work, as necessary to facilitate the smooth and orderly execution of the Work. All meetings will be held at a location designated by the Owner and/or Engineering Consultant.

B. The Contractor shall conduct daily site safety briefings as necessary for Contractor and Subcontractor employees working the site.

C. All meetings with the Owner and/or Engineering Consultant shall be attended by the Contractor's Superintendent and other personnel having authority to legally bind Contractor to issues discussed and resolved during the meetings. The Contractor's subcontractor(s) may also be required to attend such meetings. Subcontractor attendance shall be at the discretion of the Engineering Consultant.

D. Formal meetings that require attendance by the Contractor are as follows:

1. Pre-construction conference.
2. Pre-construction visit by permitting authorities having jurisdiction.
3. Weekly progress and coordination meetings (if/as scheduled).
4. Other special meetings.
5. Final walkthrough by local permitting authorities having jurisdiction.
6. Punch-list meeting.
7. Final closeout.

1.2 PRE-CONSTRUCTION CONFERENCE

A. The Contractor shall not commence Work at the Site until a pre-construction conference has been held at the Site or another mutually agreed on location at which representatives of the Contractor, Engineering Consultant, regulatory entities, and Owner are present. The pre-construction conference(s) will be arranged by the Owner or his agent and is intended to establish lines of communication between the parties involved, establish project schedules, discuss proposed performance methods, and coordinate Work to be performed by subcontractors. The time and place of the pre-construction conference(s) shall be determined after the Contract has been executed by the Contractor and the Owner.

1.3 WEEKLY PROGRESS MEETINGS

A. The Contractor and all Subcontractors shall be required to attend a Weekly Progress Meeting conducted by the Owner and/or Engineering Consultant at the work site. The purpose of these meetings is to coordinate the efforts of all Contractors and to update the Owner with respect to progress, and resolve outstanding issues.

B. Weekly Progress Meetings will be held at a time to be determined by the Owner or his agent.

C. The Contractor shall be prepared to discuss progress, resolutions to problems and anticipated problems that could delay timely completion of the work. The Contractor shall bring to each meeting: updated schedule, daily work summaries, safety meeting minutes, daily progress reports and other pertinent information as requested by the Owner.

D. The Engineering Consultant will record the meeting minutes and distribute them to the Contractor, Subcontractors and Attendees.

E. The Owner and/or Engineering Consultant may waive the Weekly Progress Meetings individually if appropriate.

1.4 SPECIAL MEETINGS

A. From time to time, the Contractor shall be required to attend Special Meetings on site as requested by the Owner and/or Engineering Consultant. The purpose of these meetings is to address Contractor and/or his Subcontractor's performance, schedule, change orders, modifications, alternatives, substitutions, safety, payment or other issues as they relate to and potentially affect the Work.

B. Special meetings requiring the Contractor's participation may also include meetings with regulatory agencies or others.

C. The Contractor shall be required to allow DEEP or its authorized representatives to access the Site and project records at reasonable times.

1.5 PUNCHLIST MEETING

A. Upon substantial completion of the project, the Contractor shall attend a "punch list" meeting with the Owner and their Engineering Consultant. The purpose of this meeting will be to discuss and list all items which require additional attention or work by the Contractor prior to final acceptance. A "punch list" memo will be produced by the Owner following this meeting and provided to the Contractor.

1.6 CLOSEOUT (FINAL ACCEPTANCE) MEETING

A. Upon resolution of all items listed on the "punch list", the Contractor shall meet with the Owner and the Engineering Consultant at the project site to verify completion such that the Owner can issue final acceptance. At this meeting the Contractor shall provide to the Owner with all outstanding documentation, records, spares, maintenance items, or other information and materials.

1.7 JOB SITE ADMINISTRATION

A. The Contractor shall keep a competent and authorized supervisory representative at the project location during all working hours who shall act as the agent of the Contractor. The supervisory representative's responsibilities shall include ensuring all issues/questions raised by the Owner and/or Engineering Consultant are addressed in a timely fashion.

B. The supervisory representative shall be a competent superintendent capable of reading and thoroughly understanding the Drawings and Specifications, with full authority to fulfill the Contractor's duties and responsibilities on the job. If, in the opinion of the Owner and/or Engineering Consultant, the supervisory

representative, or any of his successors is incompetent, or otherwise not satisfactory, then the Contractor shall replace him upon written request by the Owner.

C. The Contractor shall only employ competent workmen on the job who have received training applicable to the nature and extent of the work they are employed to perform. Whenever the Owner notifies the Contractor in writing that, in his opinion, any workmen on the job, whether employed by the Contractor or any of his subcontractors, is incompetent, unfaithful, disorderly, or otherwise unsatisfactory, such workmen shall be discharged from the contract Work and shall not be employed on it, except with the written consent of the Owner.

1.8 SUBMITTALS

A. Within five (5) days of the Notice to Proceed, the Contractor shall submit the names and contact information for the following persons involved with the Work of the Contract. Contact information shall include cell phone and home phone numbers and an e-mail address.

1. Owner of Chief Executive of Prime Contracting Company
2. Contractor's Project Manager
3. Contractor's Site Superintendent
4. Contractor's Safety Officer
5. Contractor's Environmental Compliance Responsible Party
6. Contractor's Emergency Contact (reachable outside of working hours)

PART 2. PRODUCTS

[Not Used]

PART 3. EXECUTION

[Not Used]

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. There shall be no separate measurement or payment for the work required and described under this Section.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1. GENERAL

1.1 DESCRIPTION

A. This section specifies the general requirements and procedures for preparing and transmitting data to the Engineer and the Owner for information or review. Required submittals are specified herein as well as under applicable sections of the Contract Specifications.

B. All submittals shall be clearly identified by reference to Section Number, Paragraph, Drawing Number or Detail as applicable. Submittals shall be clear and legible and of sufficient size for presentation of data.

1.2 CONTRACTOR'S DRAWINGS

A. The Contract Drawings and these Specifications show the general arrangement and such details as are necessary to provide a description of the work to be performed.

B. Shop drawings as specified in individual Sections include, custom-prepared data such as fabrication and erection/installation (working) drawings, scheduled information, setting diagrams, actual shop work manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certifications, as applicable to the work.

C. The Contractor shall prepare shop and working drawings, for temporary and permanent work as required under the applicable sections of the Contract Specifications, complete with all relevant calculations, descriptions, technical and performance data, as necessary to adequately perform the work. The Contractor shall take responsibility for such drawings and for the safe and successful construction of the work.

D. Shop drawings shall be presented in a clear and thorough manner, complete with respect to dimensions, design criteria, materials of construction, and like information to enable Consultant to review information as required.

E. Sheet size: 8½ x 11 inches or larger, as required. Typically, significant shop drawings shall be 24” x 36”.

1.3 CONSTRUCTION SCHEDULES

A. Submit three (3) copies of overall project schedule no later than eight (8) working days after Notice to Proceed.

B. Construction schedules shall be updated and re-submitted to the Engineer and Owner as required.

1.4 SAMPLES

A. Samples specified in individual Sections include physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the work.

B. Any samples shall be clearly identified as to material, manufacturer, any pertinent catalog numbers, and use for which intended, and shall be of sufficient size and quantity to clearly illustrate functional characteristics of item, with integrally related parts and attachment devices.

1.5 PRODUCT DATA

A. Product data as specified in individual Sections include, standard prepared data for manufactured products (sometimes referred to as catalog data or catalog cut sheets), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the work.

1.6 RELATED WORK SPECIFIED ELSEWHERE

A. Required submittals are listed under the relevant Section of the Contract and Specifications. It shall be the Contractor’s responsibility to read each Section and provide the submittal(s) required therein.

1.7 CONTRACTOR RESPONSIBILITIES

A. Review shop drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:

1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and similar data.
4. Conformance to specifications.

B. Coordinate each submittal with requirements of work and of Contract Documents.

C. Notify Consultant and Owner in writing, at time of submission, of any deviations in submittals from requirements of Contract Documents. Any such deviations permitted by Owner will require modifications to the Contract Documents.

D. The review and approval of shop drawings, samples or product data by the Owner’s Consultant will not relieve the Contractor from the responsibility for the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor, and the Engineer will have no responsibility, therefore.

E. Project work, materials, fabrication, and installation shall conform with approved shop drawings, applicable samples, and product data.

F. No portion of the work requiring a shop drawing, sample, or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the Contractor's risk. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

1.8 SUBMISSION REQUIREMENTS

A. Make submittals to Owner promptly in accordance with approved schedule and in such sequence as to cause no delay in the Work or in the work of any other Contractor. Each submittal, appropriately coded, will be returned within 30 calendar days following receipt of submittal by the Owner's Consultant.

B. At a minimum, submittals shall be provided to the Owner, and (in duplicate) to the Engineer. Additional requirements for the number of copies are contained in the specific Specification sections. Additional copies may be required as per the Supplementary General Conditions.

C. Shop Drawings: Shop Drawings shall be submitted as necessary to the Owner and Consultant for review and comment for the limited purpose of checking for conformance with information given in the design concept expressed in the Contract Documents. Shop drawings shall be presented in a clear and thorough manner, complete with respect to dimensions, design criteria, materials of construction, and the like information to enable the Owner and Consultant to review information as required. Sheet size shall be 8½ x 11 inches or larger.

D. Submittals shall contain:

1. Date and number of submission, and any previous submissions.
2. Project title and number.
3. Names of:
    a. Contractor
    b. Manufacturer/Supplier
4. Identification of product, with specification section number.
5. Field dimensions, clearly identified as such.
6. Relation to adjacent or critical features of work or materials.
7. Applicable standards, such as ASTM or other applicable federal or state regulations.
8. Identification of deviations from Contract Documents.
9. Identification of revisions on re-submittals.
10. A blank space suitably sized for Contractor and Consultant's stamps.
11. Where calculations are required to be submitted by the Contractor, the calculations shall have been checked by a qualified individual other than the preparer. The submitted calculations shall clearly show the names of the preparer and of the checker. Where required, calculations and drawings shall be certified and stamped by a Professional Engineer licensed in the State of Connecticut.

E. Each submittal shall be numbered. The numbering system shall utilize the Section number to which the submittal pertains and then a sequential number designating the order of the submittal for that Section. For instance, the first submittal applying to Earthwork shall be numbered as 02200-1. The second submittal applying to Earthwork shall be numbered as 02200-2.

F. Resubmission Requirements: Make any corrections, additions and/or changes in submittals required by the Owner, and re-submit revised editions. Revised submittals shall be designated with a revision number. For instance, the first revision to the second Earthwork submittal shall be numbered as 02200-2 Rev. 1.

G. Shop drawings and product data sheets 11 x 17-inch and smaller shall be bound together in an orderly fashion and bear the Certification Statement from Section 1.09.D on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package.

1.9 CERTIFICATES

A. When specified in individual specification sections, submit certification by the manufacturer, installation/application subcontractor.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certificates as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to the Owner.

D. Each shop drawing, sample and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor: "Certification Statement: by this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other approved shop drawings and all Contract requirements."

1.10 DISTRIBUTION

A. The Contractor will distribute submittals to concerned parties as appropriate. Promptly report any inability to comply with revisions. One copy of each submittal shall be submitted directly to the Owner. A minimum of two duplicates shall be submitted directly to the Consultant.

1.11 CONSULTANT'S AND RESIDENT ENGINEER'S DUTIES

A. The Owner's Engineer will review submittals only for general conformance to design concept of project and compliance with information given in Contract Documents. Review shall not extend to means, methods, sequences, techniques or procedures of performing the Work or to safety precautions or program incident thereto. Review of a separate item as such will not indicate approval of assembly in which item functions.

B. The Engineer will return submittals to the Contractor and Owner with the Engineer's written opinion as to the general conformance of the submittal with the Contract Documents. The Engineer will normally respond to all submittals within five (5) working days from the date of receipt, but no later than two weeks from the date of receipt. Re-submittals required as a result of review and comment shall be re-submitted promptly by the Contractor. Work shall not commence until all submittals related to it are submitted and accepted.

C. The Engineer's review of submittals shall not relieve Contractor from responsibility for any deviations from Contract Documents unless Contractor has, in writing, called attention to such deviation at time of submission and has received written concurrence pursuant to Contract Documents to specific deviation, nor shall any concurrence in submittals.

D. The Owner's personnel may also perform submittal review duties, at the discretion of the Owner.

1.12 OWNER'S DUTIES

A. The Owner will receive comments from the Engineer.

B. The Owner will have the final authority to judge the adequacy of the Contractor's submittal and will have final authority for approval or rejection.

1.13 SUBMITTALS PRIOR TO INITIATION OF WORK

A. The Contractor shall complete and submit all of the following submittal items consistent with the Specification requirements. All of the following submittals shall be made within eight (8) working days after the Notice to Proceed and prior to the initiation of work. Other submittals, as per the Contract Specifications, may be required prior to the initiation of work.

The relevant submittals include, but are not necessarily limited to the following:

1. Health and Safety Plan – For Information Only
2. CMP Baseline Schedule
3. Schedule of Values
4. Temporary Access Control Plan

1.14 SUBMITTALS DURING THE PERFORMANCE OF THE WORK

A. During the performance of the Work, the Contractor shall submit progress reports, as requested by the Owner. Progress reports shall be submitted at the beginning of (or before) progress meetings (Section 01200 - Project Coordination and Meetings). Such reports shall contain:

1. A summary of Work activities occurring during the period covered by the report.
2. The type of materials and/or major equipment being installed by the Contractor and the total number of employees working in each category on that particular day.
3. The names of the subcontractors working and the type of materials and/or major equipment being installed by each together with the total number of employees working for each subcontractor on that particular day.
4. The excavation, compaction, and other equipment being used by the Contractor and each subcontractor.
5. A discussion of problems encountered and corrective actions taken.

1.15 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

A. The review of shop drawings, data and samples will be for general conformance with the design concept and Contract Documents. They shall not be construed:

1. as permitting any departure from the Contract requirements;
2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
3. as approving departures from details furnished by the Engineer, except as otherwise provided herein.

B. The Contractor remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.

C. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which the Owner's Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or Contract Time, the Engineer may return the reviewed drawings without noting an exception.

D. Submittals will be returned to the Contractor under one of the following codes:

Code 1 – "REVIEWED" – This code is assigned when there are no notations or comments on the submittal. When returned under this code the Contractor may release equipment or material for manufacture.

Code 2 – "REVIEWED AS NOTED" – This code is assigned when a confirmation of the notations and comments IS NOT required by the Contractor. The Contractor may release equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.

Code 3 – "REVIEWED AS NOTED/RESUBMISSION REQUIRED" - This combination of codes is assigned when a confirmation of the notations and comments IS required by the Contractor. The Contractor may, at his own risk, release equipment or material for manufacture; however, all notations and comments must be incorporated into the final product. This confirmation shall specifically address each omission and nonconforming item that was noted. Confirmation is to be received by the Engineer within 15 calendar days of the date of the Engineer's transmittal requiring the confirmation.

Code 4 – "REVISE AND RESUBMIT" - This combination of codes is assigned when notations and comments are extensive enough to require a re-submittal of the package. This re-submittal is to address all comments, omissions and non-conforming items that were noted. Re-submittal is to be received by the Engineer within 15 calendar days of the date of the Engineer's transmittal requiring the re-submittal.

Code 5 – "REJECTED"- This code is assigned when the submittal does not meet the intent of the Contract Documents. The Contractor must resubmit the entire package revised to bring the submittal into conformance.

Code 6 – "COMMENTS ATTACHED" – This code is assigned where there are comments attached to the returned submittal which provide additional data to aid the Contractor.

Code 7 – "RECEIPT ACKNOWLEDGED" - This code is assigned to acknowledge receipt of a submittal that is not subject to the Design Engineer's review and approval; and, is being filed for informational purposes only.

Codes 1 through 5 designate the status of the reviewed submittal with Code 6 showing there has been an attachment of additional data.

E. Re-submittals will be handled in the same manner as first submittals. On re-submittals the Contractor shall identify all revisions made to the submittals, either in writing on the letter of transmittal or on the shop drawings by use of revision triangles or other similar methods. The re-submittal shall clearly respond to each comment made by the Owner's Consultant on the previous submission. Additionally, the Contractor shall direct specific attention to any revisions made other than the corrections requested by the Owner's Consultant on previous submissions.

F. Partial submittals may not be reviewed. The Owner's Engineer will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor and will be considered "REJECTED" until resubmitted. The Owner's Engineer may at his option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.

G. Repetitive Review

1. Shop drawings and other submittals will be reviewed no more than twice at the Owner's expense. All subsequent reviews will be performed at times convenient to the Owner's Engineer and at the Contractor's expense, based on the Engineer's then prevailing rates. The Contractor shall reimburse the Owner for all such fees invoiced to the by the Engineer. Submittals are required until given a review Code status 1, 2 or 7.

2. Any need for more than one resubmission, or any other delay in obtaining Consultant's review of submittals, will not entitle Contractor to extension of the Contract Time.

H. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the Owner and Engineer at least 7 working days prior to release for manufacture.

I. When the shop drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Owner's Engineer.

PART 2. PRODUCTS

[Not Used]

PART 3. EXECUTION

[Not used]

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. No separate payment will be made for this Section.

END OF SECTION

SECTION 01500

TEMPORARY FACILITIES & CONTROLS

PART 1. GENERAL

1.1 SCOPE

A. This Section includes requirements for temporary facilities and controls.

B. Possible Contractor staging areas are located as shown on the Contract Drawings. The locations of all temporary facilities described must be approved by the Owner or Engineer.

C. The Work of this Section includes the provision, maintenance, and removal of a temporary field office trailer for the Owner/Engineer, at the site. The field office trailer shall be provided and maintained by the Contractor for the duration of the project for the exclusive use of the Owner/Engineer.

D. The Work of this Section shall include the provision and maintenance of certain equipment for the use of the Owner/Engineer.

E. The Contractor may separately provide for his/her own field office trailer.

F. All temporary facilities provided by the Contractor under this Section as specified herein shall meet all federal, state and local codes and requirements for such temporary installations. All temporary field office facilities shall be provided and maintained so as not to create fire or safety hazards. Costs necessary to satisfy all requirements specified herein shall be borne by the Contractor. All necessary permits for setup and utility installation shall be the responsibility of the Contractor. All temporary field office facilities shall be entirely removed upon completion of the work and the site shall be left in a clean condition to the satisfaction of the Owner.

G. The Contractor shall be responsible for installing, providing, maintaining, and decommissioning all utility service to any temporary field offices. The cost of all utilities shall be considered incidental to the cost of this item. Electric service is available in the vicinity of the Site. The Contractor shall verify the location of temporary electric service with the Owner.

H. The Contractor shall provide the Engineer and representatives of the Owner, including its Consultants, with access to and use of all temporary facilities and services provided by the Contractor.

I. The Contractor shall provide and erect a Project Sign and other signage as required.

J. The Contractor shall provide temporary construction fencing or other barricades, acceptable to the Owner to delineate areas of work and maintain the continuity and function of existing fences and gates removed by the Contractor as required, or as necessary to enable the Work.

K. The Work of this Section shall also include such additional work as the Owner deems necessary for informing the public of the work at the site. This public information work shall include all such work not otherwise required under other Sections of the Work or as conditions in permits issued to the Project.

1.2 TEMPORARY OFFICES FOR CONTRACTOR AND ENGINEER

A. Temporary offices shall be established at the site, within the staging area or where approved by the Owner/Engineer, adequately furnished, and maintained in a clean, orderly condition by the Contractor. The structure must comply with all applicable local, state, and federal standards and codes. All necessary permits for setup and utility installation shall be the responsibility of the Contractor. The temporary field office provided to the Engineer shall conform to the specifications shown below in Paragraph 2.01 and supplied with the equipment and supplies described therein. The trailer, its contents, and all service to the trailer shall be provided for the duration of the project. It shall be Contractor's responsibility, at his sole expense, to maintain, supply, clean, and service the trailer for the duration of the project, including the provision of all utilities and sanitary service.

B. The Contractor is not required to provide a portable trailer or other such structure as his/her own temporary project field office. If the Contractor chooses to do so, such structures must comply with all applicable local, state, and federal standards and codes. Location of the field office at the site shall be approved by the Owner. All necessary permits for setup and utility installation shall be the responsibility of the Contractor.

1.3 SUBMITTALS

A. No later than ten (10) calendar days prior to bringing the facilities on site, the Contractor shall submit a description of the temporary facilities and controls.

B. No later than ten (10) calendar days prior to bringing the facilities on site, the Contractor shall submit a description of the temporary facilities and services to be used by the Contractor, including the location of laydown/storage areas, fueling areas, fencing, proposed temporary office trailer, and any other temporary facilities.

C. Submit a sample or proof or template of the proposed Project Sign to the Engineer and Owner for review prior to sign fabrication.

1.4 TEMPORARY LIGHT AND POWER

A. The Contractor shall supply temporary electricity to the Engineer's field office. Electric supply shall be provided by a temporary service wiring connected to the grid or generator.

B. Alternatively, the Contractor may choose to provide electricity to portions of the Project by means of temporary on-site generators. On-site generators must comply with local ordinances on noise control and fuel containment. The Contractor shall service and fuel the generators, if used, for the duration of the Project.

C. Temporary lighting and wiring shall be installed in accordance with all local, state, and federal regulations.

D. Ground fault circuit interrupters (GFCI) shall be required on all electrical equipment.

E. The Contractor may elect to install temporary lighting to illuminate the worksite for work (or security purposes) after dark. However, the Contractor is subject to all local and state work ordinances and must file appropriate applications and receive acceptance prior to performing work outside of the approved window. The use of temporary lighting for security purposes or work after dark shall be only with prior approval of the Owner.

F. Provide guard cages or tempered glass enclosures where temporary lighting may be exposed to breakage. Provide exterior fixtures where temporary lighting may be exposed to moisture.

1.5 TEMPORARY HEAT

A. Provide all heat as may be necessary for thawing out and heating the ground or materials and for proper execution, protection, curing, and drying out of the work.

1.6 WEATHER PROTECTION

A. The Contractor shall provide all such temporary facilities needed to protect completed and on-going work and on-site materials from inclement weather, including rain, heat, snow, and cold. This shall include, but not be limited to, the provision of covers, shelters, heaters, etc. The use of rigid barriers for weather protection shall be used as required and as determined by the Owner/Engineer.

B. Temporary heating units shall have been tested and labeled by UL, FM, or other recognized association related to the type of fuel being used, and maintain reasonable temperatures within the temporary enclosures.

C. The Contractor shall be responsible for maintaining and/or restoring access and appropriate working conditions at the site in the event of inclement weather. This shall include, but not be limited to, providing for plowing and ice removal in the event of snow and freezing temperatures.

D. Snow plowed or removed by the Contractor may not be disposed of in the wetlands, river, or any other waterway.

1.7 TEMPORARY AIR, STEAM AND WATER

A. Provide all air, steam and water, including temporary piping and appurtenances required to perform the work of this Contract, as required. Remove temporary piping and appurtenances upon completion and approval of Work.

1.8 TEMPORARY SANITARY FACILITIES

A. Provide self-contained, single occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed in a fiberglass or other approved non-absorbent shell. These facilities shall be maintained weekly, at a minimum.

1.9 FIRE PROTECTION

A. All operations on the site premises shall be so performed that fire hazards are not created or allowed to exist. If the Contract Work involves a fire hazard, sufficient firefighting equipment with trained, capable operators shall be in the area to contain any fire until the local fire District arrives. The Contractor shall make sure that persons employed directly or indirectly by him, while on the site premises, comply with all pertinent local, state and federal fire regulations. The Contractor shall have a procedure for response to fires on-site. The Contractor shall be responsible for compliance by personnel of his organization for their cooperation in fire prevention, fire reporting and protective measures to minimize loss.

B. Provide portable UL rated, Class A fire extinguishers for temporary offices and similar spaces. In other locations, provide portable UL rated Class ABC dry chemical extinguishers or a combination of NFPA recommended Classes for the exposure. Comply with NFPA 10 and 241for classification, extinguishing agent and size required by location and class of fire exposure.

1.10 TEMPORARY FENCING/BARRIERS

A. The Contractor shall provide temporary fencing or barriers to prevent unauthorized entry to construction areas and Work Zones, to delineate temporary contractor staging areas, and to protect existing facilities, adjacent properties and the public from damage from construction operations.

B. The Contract Work includes temporary removal, restoration, replacement, relocation, and improvement of certain existing chain link fences and gates around the Site perimeter and crossing the Animal Shelter Driveway as may be required to enable the Work and Contractor's access, as indicated on the Contract Drawings, as required, and as directed by the Owner or Engineer.

C. The Contractor shall also be responsible maintaining the continuity and function of existing fences and gates impacted by the Work throughout the duration of construction. The Contractor shall provide, install, adjust, and maintain suitable temporary chain link fence and gate panels or approved equivalent devices to maintain the continuity and function of the existing fences and gates, from the time of removal and until permanent fence restoration and improvements are complete and the work is accepted by the Owner.

D. Additional temporary fencing or barriers may be required on the site, as determined by the Owner and/or Engineer, and shall be provided at no additional cost to the Owner.

1.11 PROJECT SIGNAGE

A. The Contractor shall provide and erect a Project Sign at the project site identifying the project and indicating that the Connecticut Department of Environmental Protection Clean Water Fund is providing funding for the construction of the project.

B. The Project Sign shall be erected within 14 days after the notice to proceed has been issued and shall be in accordance with these specifications and the project sign detail enclosed at the end of this Section.

C. The Project Sign shall be furnished, erected (on posts), and maintained by the Contractor in an upright position, clearly visible to the public and visitors to the Site, at a location designated by the Owner or the Owner's Representative. The Project Sign shall not be removed until the Project is completed.

D. If directed by the Owner, the Contractor shall remove the Project Sign and associated posts and hardware and dispose of the materials off-Site at no additional cost to the Owner.

E. The names of the Commissioner of Environmental Protection and the Governor of the State of Connecticut as shown on the sign shall be kept current and shall be revised within 30 days of such notice to the Contractor that a change has occurred, at no cost to the Owner.

F. No additional information shall be placed on the project sign beyond that shown in the project sign detail. If the owner desires to erect a supplemental sign with additional detail regarding the project or its sponsors, that sign shall be placed in such a manner that the project sign is not obscured from public view.

G. The Contractor shall also construct and install any additional signage required by regulatory agencies, permits, or Orders. These signs, if required, shall be mounted separately from the Project Sign and in accordance with the corresponding agency requirements.

1.12 MISCELLANEOUS REQUIREMENTS

A. The Contractor shall provide temporary medical and first-aid supplies at the work site, adequately equipped, maintained and located, to serve the needs of the workmen and employees of the Contractor, subcontractors and assigned contractors.

1.13 SECURITY AND PROTECTION OF WORK

A. The Contractor shall be responsible for providing and maintaining security for protection of his work, equipment, supplies and employees and shall be responsible for protecting same from unauthorized entry, vandalism, or theft.

B. The Contractor shall protect installed work and excavations and provide special protection where specified in individual specifications.

C. The Contractor shall provide temporary and removable protection for equipment and open excavations, and shall control activity in the immediate work area to minimize damage.

1.14 REMOVAL OF TEMPORARY FACILITIES AND CONTROLS

A. The Contractor shall remove all temporary equipment, facilities, and materials after completion and acceptance of work at the Site.

B. The Contractor shall clean and repair damage caused by installation or use of temporary facilities and controls.

C. Restore existing and permanent facilities used during construction to original condition.

PART 2. PRODUCTS

2.1 TEMPORARY OFFICE FOR OWNER/RESIDENT ENGINEER

A. The temporary office shall be weather-tight with minimum 8-foot by 20-foot floor plan, have a tight floor at least 8-inches off the ground, and shall be insulated all around with rigid insulation board not less than ½-inch thick and suitably ventilated. The office shall have at least three screened windows capable of being opened, a screen door and a solid door provided with cylinder lock and three keys. The office shall be provided with janitorial service on a weekly basis, heating equipment, electrical wiring, outlets and fixtures suitable to light the tables and desk adequately as directed. Provide separate toilet facilities for the exclusive use of the Owner/Engineer. A minimum of two (2) parking spaces shall be provided for the use of the Owner/Engineer.

B. The field office trailer shall contain the following minimum operable standard furnishings and equipment:

1. One plan table, 3-foot by 5-foot and one stool
2. Two (2) Desks about 3-foot by 5-foot with desk chair
3. Four additional chairs
4. Plan rack, as directed
5. Shelves, as directed

6. Four-drawer, filing cabinet with lock
7. Coat rack and hooks
8. Desk calculator
9. Air Conditioner (12,000 BTU)
10. Current model of multifunction printer/copier/scanner/fax capable of handling paper up to 11 by 17 inches, Aficio MP C2051 by Ricoh or equal.
11. One conference table (12-foot).
12. Sixteen folding chairs.
13. Cross-cut shredder with basket, Fellowes Model No. P600C02, or equal.
14. First aid kit suitable for ten people with manual, American White Cross No. K10 or equal.

C. The Contractor shall supply all fuel for heating and pay all utility bills for the temporary office.

D. All temporary electrical and plumbing services shall be done in accordance with the National and Connecticut Electrical Code and the Connecticut Plumbing Code, respectively.

E. At the time the field office is made available to the Owner/Resident Engineer, the Contractor shall furnish evidence to the Owner that insurance in the minimum amount of $2,500.00 (non-deductible) has been obtained which will protect the Owner and/or its employees or agents against loss of property in the field office from fire, theft, storm or flood. The insurance will be kept in effect during the entire period of occupancy, with evidence of all necessary renewals being promptly forwarded to the Owner.

F. In the case of fire, theft or breakdown, all equipment involved shall be repaired or replaced by the Contractor within 48 hours.

G. In the event the field office is destroyed or rendered untenable for any reasons, it shall be replaced within two weeks, or as directed.

2.2 EQUIPMENT

A. The Contractor shall provide all necessary equipment related to the requirements of this Section such that the work of the Contract can be conducted in accordance with the applicable Contract Documents.

2.3 TEMPORARY FENCING

A. Temporary Fencing Materials:

1. Reference ASTM F3342
2. Galvanized Steel Panels; minimum 6 feet high; maximum 14 feet wide.
3. Welded steel tube frame and galvanized steel mesh.
4. Portable bases constructed of steel, concrete, or polymer frames designed to support installed panels. Sandbags or other forms of additional weight may be placed on top of portable bases for additional support.

5. Galvanized steel fittings, clamps, rings, fasteners, and other connectors as necessary to properly secure temporary fence panels together and to existing fencing to remain or other suitable barrier.

2.4 PROJECT SIGNAGE

A. Project Sign Materials:

1. Sign: 4’ high by 8’ wide by ¾” minimum thickness exterior grade plywood (A-B) or APA high density overlay plywood (HDO).
2. Paint: White outdoor enamel paint, 3 coats minimum, all sides
3. Lettering: Black
4. Logos/Graphics: As Required. Refer to enclosed project sign detail.
5. Posts: Two (minimum) of sufficient height and rigidity to support the sign as required. 4x4 pressure treated timber posts or galvanized steel pipe.
6. Fasteners: Steel – stainless or hot dipped galvanized

PART 3. EXECUTION

3.1 GENERAL

A. The Contractor shall sweep and clean as necessary to maintain neat, orderly work areas.

B. The Contractor shall furnish all materials and perform all work necessary, including excavation and backfill. No disturbance will be allowed in areas outside those indicated on the plans, without prior approval from the Owner. The Contractor will be responsible for repairing all cuts made for temporary utilities and for the removal of temporary utilities and post-removal restoration.

3.2 FIELD OFFICE MAINTENANCE

A. All sewer, water, electric and telephone services shall be continuously connected. Electric lights and current, proper heating, hot and cold water, satisfactorily cooled drinking water and telephones shall be available at all times, both night and day. The toilets and lavatories shall be maintained in continual service; trash, garbage and other wastes shall be properly and satisfactorily disposed of. Janitor service, to keep the quarters and equipment neat and clean as acceptable working space, shall be furnished regularly, at least once per week. Repairs shall be made from time to time, as required and as directed by the Owner.

B. The Contractor shall furnish a supply of fluorescent light bulbs, copy paper, printer photo paper, ink cartridges, and toner cartridges all as approved by the Owner.

C. The Contractor shall also provide snow removal of access and parking areas.

3.3 PROJECT SIGNAGE

A. Maintain signage throughout the duration of the project. The Contractor shall repair or replace the signage at his sole expense in the event of damage.

B. Logos for the Owner and Engineer are available upon request. Cost numbers and other information will be provided to the Contractor after award of the Contract.

C. Remove all temporary signage at the completion of the project and lawfully dispose. Fill post holes.

3.4 PUBLIC INFORMATION

A. The Owner may request the Contractor to take certain steps to assist in providing information to the public regarding this project. This assistance may take the shape of additional informational signage, newspaper ads, or other similar outreach actions.

B. The Owner will provide the Contractor with the form and text of any requested public information steps which are to be executed under this item.

C. The Work of this Section is separate from any required public information steps which are required in other Sections of the Work and/or by permit conditions. The cost of public information notices and other similar steps (including but not limited to signs, newspaper ads, etc.) required under other Sections of the Work and/or by Permit Conditions shall be included in the price bid for other Items.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

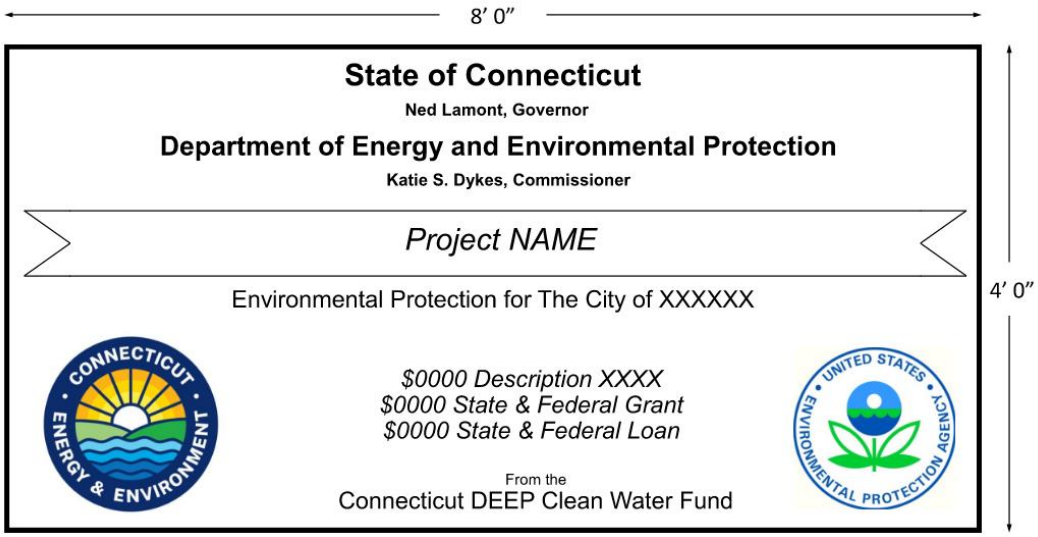
A. Measurement and payment for Contract Item 01500.1 TEMPORARY FACILITIES shall be made at the lump sum contract unit price for the proportion of temporary facilities work provided, maintained, and completed, as required and as indicated on the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; provision and erection of a project sign and other project-related signage; establishment and maintenance of Contractor's construction access and vehicle parking, material storage, staging, and laydown areas; provision, erection, maintenance, adjustment, and relocation of temporary construction fencing or other barricades; temperature control; first aid and fire safety; temporary sanitary facilities; temporary utility services and lighting; on-Site field offices and maintenance; public information; and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified. Partial progress payments for this item shall be based on the Contractor's Schedule of Values, the proportion of satisfactory work performed, and subject to the approval of the Owner and Engineer.

B. PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
01500.1	TEMPORARY FACILITIES	LUMP SUM

Attachment 1. PROJECT SIGN DETAIL

CONNECTICUT CLEAN WATER FUND PROJECT SIGN



Color Scheme:
Lettering in black
Background in white
Banner in yellow
Logo as pictured

Provide adequate supports for sign as site conditions may require. Keep sign a proper distance above prevailing grade to permit public viewing.

Revised December 2022

END OF SECTION

SECTION 01560

TEMPORARY EROSION AND SEDIMENTATION CONTROLS

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall furnish all labor, materials and equipment and shall perform all work required to install, maintain, and remove erosion, sedimentation, and siltation control measures to protect the site, and upstream and downstream wetlands, water bodies, streams, and drainage structures from siltation and sedimentation damage and accumulation or damage from other byproducts of the work during this Contract, as specified herein and as directed by the Owner or its Engineer.

B. Erosion control measures are used to prevent the displacement of soil. Such measures may include, but not be limited to, grading, erosion control matting, staked straw-bales, erosion control socks, silt fences, silt sacks, plastic coverings, mulching, temporary seeding, riprap, check dams, cross tracking, and other items intended to stabilize soil material and/or reduce the erosive potential of water.

C. Sedimentation and siltation control measures are used to prevent the movement and transport of soil particles. Sedimentation and siltation control measures may include, but not be limited to, use of compost filter socks, pumped water filter bag(s), filtration dams, siltation sumps, turbidity curtains, and other items as necessary to contain sediment and other deleterious material produced from tree stump and related vegetation removal, demolition, excavation, shaping and filling, dewatering, pile installation, structure construction, concrete placement, embankment construction, utility locating, turf establishment, site restoration, and related contract operations.

D. The Work shall also include all work necessary to continually clean and maintain and promptly repair/replace all erosion, sedimentation, and siltation measures as needed to sustain their intended function and operability.

E. The Contractor shall use all Best Management Practices (BMPs), both structural and operational, to reduce, to the greatest extent possible, the erosion and transport of soil and sediment. The Contractor shall use all measures which are both prudent under good construction practices and required under local, state, and Federal regulations and law. The Contractor shall monitor, maintain, and repair all BMPs. In the event of the failure of sediment and erosion control BMPs, the Contractor shall provide, at no additional cost to the Owner, all work necessary to mitigate and correct the situation, including, but not limited to, the removal of transported sediment.

F. The work of this Section includes sediment and erosion control in and around all disturbed areas of the Site, including staging and laydown areas, and along roadways in the vicinity of the Site.

1.2 SCOPE OF WORK

A. The scope of the Work of this Section includes the installation of silt fence, silt sacks, erosion control socks, erosion control blankets, straw bales, and stabilized construction access and other items used for Erosion and Sediment Control (E&SC) as shown on the Contract Drawings, and as needed elsewhere. This work also includes the monitoring, cleaning, maintenance, and repair/replacement of all installed siltation, erosion, and water control/handling devices as well as proper removal and disposal of same after final stabilization of the site.

B. General work covered and paid for under this Section includes the installation of all other sediment and erosion control BMPs, as shown on the Contract Drawings, and as needed elsewhere. This work also includes the monitoring, cleaning, maintenance, and repair of all installed sediment and erosion control BMPs and disposal after final stabilization of the site. General work covered and paid for under this Section also includes all other work, including record keeping and reporting, necessary to meet the conditions of the Contract Documents, Permits, Approvals, Licenses issued for the project and all relevant codes, rules, regulations, laws and ordinances applicable to sediment and erosion control.

1.3 SPECIAL CONDITIONS

A. All work shall comply with all codes, rules, regulations, laws and ordinances and executed in conformance with any permits, licenses etc., as issued by the Town of Stratford, the Connecticut Department of Energy and Environmental Protection (CTDEEP), and all other authorities having jurisdiction within the project areas. All work necessary to make site preparation comply with such requirements shall be provided without additional cost to the Owner.

B. Copies of all permits and licenses listed under Sections 01060, and not otherwise included in that section or attached, will be forwarded to the Contractor prior to the beginning of the work. The Contractor shall conduct its work in accordance with all provisions of said permits.

C. The Contractor shall procure all other required permits and licenses, (except for those to be obtained by the Owner as stated herein), pay all charges, fees and taxes and shall give all notices necessary and incidental to the due and lawful prosecution of the work under this Contract. The cost thereof shall be included in the prices bid for the various items specified herein for the work of this Contract. Copies of all required permits and licenses shall be filed with the Owner prior to the beginning of the work.

D. The disturbance area at the site is likely to be less than five acres in total and therefore not under the jurisdiction of the NPDES general construction permit process. Regardless of the need for a SWPPP under the NPDES permit, the Contractor shall be responsible for developing a site-specific sediment and erosion control plan which shall be submitted to the Owner. The Contractor's plan shall incorporate the requirements of this Section and the controls and BMPs shown on the Contract Drawings; however, it shall be understood that these measures called for in the specifications and on the plans represent the MINIMUM acceptable level of sediment and erosion control. The Contractor's plan shall be designed to account for the anticipated work plan, construction sequence, and anticipated level of disturbance.

E. No work of any type in any area shall commence until sedimentation control measures are in place to the satisfaction of the Owner, the Engineering Consultant and permitting agencies/representatives having jurisdiction.

1.4 IMPLEMENTATION

A. The Contractor shall familiarize himself with the nature of work to be performed. The Contractor shall be responsible for scheduling his submittals and/or meetings, if required, with the applicable regulatory agencies.

B. Measures may include, but not be limited to, the following:

1. Erosion Control Socks (Compost Filter Socks).
2. Silt Fences.
3. Silt Sacks (at Catch Basins).

4. Stabilized Construction Access.
5. Erosion Control Blankets.
6. Vegetative Cover/Soil Stabilization.
7. Staked Straw-Bales.
8. Placement and operation of pumped water filter bags.
9. Filling and stabilizing of erosion gullies with gravel.
10. Application of weed-free straw, wood chips, (or other) mulch.
11. Track-roughening of slopes to slow runoff flow.
12. Temporary swales to divert drainage flow.
13. Energy dissipaters for pipe, culvert, and hose discharge points.
14. Turbidity Curtains.

1.5 LOCATION AND STORAGE OF MATERIALS

A. No materials shall be dispersed or stockpiled in any wetland areas, except as shown on the Contract Drawings. No excavated materials or materials to be used in the backfilling shall be deposited within one hundred feet (100') of any spillways, streams, rivers, and related areas, watercourses, wetland areas or drainage facilities unless appropriate and approved measures are specifically taken to protect the adjacent resource area and storage has been approved by the Engineering Consultant. Materials rejected for use in the Work shall be removed and disposed of as soon as practical to do so. Adequate protective measures shall be taken to prevent the erosion of stockpiled and/or placed materials and resultant sedimentation of adjacent spillways and related areas, watercourses, wetland areas or drainage facilities, during the course of performing the work. These include containing stockpiles using erosion and sediment control BMPs and covering the stockpiles with 20-mil poly plastic sheeting overnight and in advance of forecast rainfall as required, as indicated on the Contract Drawings, and as directed by the Engineer.

1.6 PROTECTION OF THE RIVER AND OTHER WATER RESOURCES

A. The Contractor shall employ Best Management Practices (BMP's) throughout the conduct of the work of this Contract and ensure that impact on Housatonic River and surrounding wetlands is minimized.

B. The Contractor shall not store or discharge fuel oil, sewage, septic water or other deleterious substances into the river, stream, groundwater supplies or wetlands areas. The storage of fuel oil and refueling of equipment shall be restricted to designated areas approved by the Engineer, the Owner or regulatory agencies. Machinery shall not be refueled or washed within 100 feet of any resource area. Any spillage of deleterious substance (fuel oil, hazardous material, sewage, septic waste, etc.) shall be reported to the Engineer, the Owner, and appropriate regulatory agency, by the Contractor and appropriate measures taken, (at costs solely borne by the Contractor) as determined by the regulatory agency, to contain and to clean up the affected areas. Any water that is pumped or bailed from the excavations shall be conveyed by conduit or hose to approved points of discharge. **Water shall be filtered through approved discharge area erosion controls and/or pumped water filter bag(s), constructed in such a manner so as to minimize velocities of discharge and to contain silt.** Sedimentation barriers shall be cleaned and/or replaced periodically to ensure effective control and protection of wetlands and water resource areas.

C. The Contractor shall ensure that temporary erosion and sediment controls are adequate to ensure compliance with applicable local, State and Federal regulations, or other more stringent regulations, as needed.

1. Solids - These waters shall be free from floating, suspended and settleable solids in concentrations or combinations that would impair any use assigned to this class, that would cause aesthetically objectionable conditions, or that would impair the benthic biota or degrade the chemical composition of the bottom.

2. Color and Turbidity - These waters shall be free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to this class. Turbidity in wetland resource areas resulting from activities in or near wetlands shall not exceed 50 N.T.U's, or as otherwise required by the State or other controlling body.

1.7 RELATED SECTIONS

01010	SUMMARY OF WORK
01050	FIELD ENGINEERING
01060	REGULATORY REQUIREMENTS
01100	SPECIAL PROVISIONS
01110	ENVIRONMENTAL PROTECTION PROCEDURES
01200	PROJECT COORDINATION AND MEETINGS
01300	SUBMITTALS
01500	TEMPORARY FACILITIES AND CONTROLS
01560	TEMPORARY EROSION AND SEDIMENT CONTROLS
01740	SITE RESTORATION
01900	MOBILIZATION / DEMOBILIZATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02110	CLEARING, GRUBBING, AND STRIPPING
02300	EARTHWORK
02315	SOIL MANAGEMENT PLAN
02319	TEMPORARY WATER CONTROL
02373	RIPRAP
02375	GABIONS
02465	AUGER CAST PILES
02475	DRILLED MICROPILES
02510	BITUMINOUS CONCRETE PAVEMENT
02633	INLINE CHECK VALVES
02660	DUCTILE IRON PIPE AND FITTINGS
02665	VALVES AND APPURTENANCES
02710	UNDERDRAIN SYSTEM
02760	PIPELINE ABANDONMENT
02820	CHAIN LINK FENCE AND GATES
02840	VEHICLE GUIDE RAILS
02930	LOAMING, SEEDING, AND REVEGETATION
03300	CAST-IN-PLACE CONCRETE
05500	MISCELLANEOUS METALS
11287	DEPLOYABLE FLOOD BARRIER SYSTEMS

1.8 SUBMITTALS

A. A written plan detailing the methods and layout of BMPs proposed to contain sediments, soils, and debris at the Site must be submitted to the Owner for review and approval prior to proceeding with the work of this Section.

PART 2. PRODUCTS

2.1 TEMPORARY GRASS SEED

A. Grass seed for temporary erosion control shall be Annual Ryegrass applied at a minimum rate of 2 pounds per 1,000 square feet (SF).

B. Refer to Section 02930 Loaming, Seeding, and Revegetation for seeding requirements associated with permanent revegetation, establishment of turf, and restoration of lawn and grass areas.

2.2 PUMPED WATER FILTER BAG

A. Pumped water filter bags used as sedimentation control and filtration of water generated from dewatering activities shall be a Dirtbag® pumped sediment control device(s) (Model 53 or 55) as detailed on the Drawings or approved equivalent. The Dirtbag® pumped-silt control system is marketed by ACF Environmental, Inc., Richmond, Virginia.

B. The Dirtbag® shall be a nonwoven geotextile bag which is sewn with a double needle matching using a high strength thread. Seams shall have an average width strength per ASTM D-4884 as follows: Dirtbag® 53 ASTM D-4884 60 pounds per inch (lb./in); Dirtbag® 55 ASTM D-4884 100 lb./in.

C. Each standard Dirtbag® shall have a fill spout large enough to accommodate a 4-inch discharge hose. Straps shall be used to secure the hose and prevent pumped water from escaping without being filtered.

D. Geotextile fabric shall be nonwoven fabric with the following properties:

			Nonwoven	
Properties	**Test Method**	**Units**	**53**	**55**
Weight	ASTM D-3776	Oz/yd	8	10
Grab Tensile	ASTM D-4632	Lbs.	230	250
Puncture	ASTM D-4833	Lbs	130	165
Flow Rate	ASTM D-4491	Gal/Min/Ft^2	80	70
Permittivity	ASTM D-4491	$Sec.^{-1}$	1.5	1.3
Mullen Burst	ASTM D-3786	$Lbs./in^2$	400	550
UV Resistant	ASTM D-4355	%	70	70
AOS % Retained	ASTM D-4751	%	100	100

2.3 COMPOST FILTER SOCKS

A. Compost filled filter socks for use as a sedimentation control device shall be 12-inch minimum diameter by 10 feet long such as SiltSoxx as manufactured by Filtrexx International, LLC of Grafton, Ohio, or approved equivalent. The sock shall be designed to provide intimate contact with the ground surface to

prevent blowouts or undermining. At the same time the sock shall allow water to flow through the compost, minimizing overtopping, slowing high water flow velocities, and intercepting and stopping silt movement.

B. Stakes for affixing compost filter socks in place shall be wooden, 2-inch square by a minimum of 36-inches long. Stakes shall be installed in accordance with the filter sock manufacturer's instructions.

2.4 SILT FENCE

A. Filter fabric siltation fencing shall be a woven filter fabric having a weight of at least 2.5 ounces per square yard, a thickness of at least 17 mils, a coefficient of permeability of not less than 0.0009 centimeters per second and allows a water flow rate of a minimum 40 gallons per minute per square yard. The material shall have a high sediment filtration capacity, high slurry flow and minimum clogging characteristics. The material shall be equal to FW-300 as manufactured by Mirafi, Inc., Charlotte, North Carolina; Amoco 2130 by Nilex, Inc., Centennial, CO; MISF 180 by Mutual Industries, PA; or equal.

B. Wooden stakes shall be provided, attached to the silt fence fabric, spaced, and otherwise installed in accordance with the silt fence manufacturer's instructions and as indicated on the Contract Drawings.

2.5 SILT SACKS (FOR CATCH BASINS)

A. Silt Sacks shall be manufactured from a specially designed woven polypropylene geotextile and sewn by a double needle machine, using a high strength nylon thread to filter and collect sediment from stormwater runoff at existing catch basins.

B. Silt Sacks shall be manufactured to fit the opening of the catch basin or drop inlet.

C. Silt Sacks will have the following features and as indicated on the Contract Drawings:

1. Dump straps (minimum of two) attached at the bottom to facilitate emptying.
2. Lifting straps as an integral part of the system to be used to lift Silt Sacks from the catch basin.
3. A restraint cord approximately halfway up the depth of the sack to keep the sides from expanding toward the catch basin wall (this cord is also a visual means of indicating when the sack should be emptied).

2.6 TURBIDITY CURTAIN

A. Turbidity Curtains are a floating system designed to confine and control suspended sediment in a water body. The turbidity curtain system provided by the Contractor shall provide for an impermeable barrier which will trap suspended sediment within the area encircled by the curtain and promote settling of suspended particles. The turbidity curtain system used shall account for the specific conditions at the site, including range of depths, water velocity, wind and wave action, sediment characteristics, etc.

B. Turbidity curtains shall include a floatation boom, a suspended impermeable curtain or skirt of appropriate length, ballast, a skirt connection system, and an anchorage system.

C. Turbidity curtains shall include end and intermediate anchors sufficient to maintain the position of the line of curtains.

D. Turbidity curtain systems manufactured by Elastec, American Marine, ABASCO or equal will be accepted.

2.7 SAFETY FENCE

A. Safety fence shall be model number PSF-50 (48 inches x 50 feet) or PSF-100 (48 inches x 100 feet) as available from DGI Industries, New Hampshire or approved equivalent.

B. Composition shall be of polyethylene and conform to the following specifications:

Material	Polyethylene
Color	OSHA Orange
Roll Width	48 inches
Aperture Size	MD x TD 3.75” x 1.75”
Rib Thickness	MD ⅛”, TD ¼”
Tensile Strength	MD 100.33 N/strand, TD 123.33 N/strand
Ultraviolet Resistance	2 year exposure resistance
Elongation at Break	50% +/-
Working Temp. Range	-85 to 195 degrees Fahrenheit

C. Safety fence shall be supported every eight feet (8’) on center with sixty-inch-long (60”) wood posts having a minimum cross section surface area of one and one half (1½) inches and secured with five (5) wire or zip ties at each posts. Posts shall extend twelve (12”) inches below grade.

2.8 STABILIZED CONSTURCTION ACCESS

A. Provide materials for Stabilized Construction Access, including crushed stone and geotextile fabric, as indicated on the Contract Drawings and as specified under Section 02300 – Earthwork.

2.9 SOIL MATERIAL

A. Soil material for use in sediment and erosion control measures shall conform to the specifications set out in Section 02300 – Earthwork. In general, all soil material must be clean, stable, and free or silt, clay, and organics.

2.10 STONE AND ROCK

A. Stone and rock material for use in sediment and erosion control measures shall conform to the material specifications of the Connecticut Department of Transportation Standard Specifications (latest edition). In general, all soil material must be clean, stable, and free or silt, clay, and organics. Sizing of the stone shall be determined by the Contractor and shall be appropriate for expected flow rates and velocities. Storms with return periods of not less than two-years should be used in determining the sizing of stone and rock.

2.11 OTHER MATERIALS

A. Other materials required for completion of the work in this Section shall be of adequate quality and construction such that intended performance is satisfied.

B. Hay bales **shall NOT** be used as erosion control for this Site due to the potential for introduction of unwanted seeds. However, weed-free straw bales may be used.

PART 3. EXECUTION

3.1 FLOOD FLOWS

A. The Contractor is advised that flows into the Site and water levels of resource areas may vary substantially due to climatic and seasonal conditions and they shall be responsible for controlling and handling ground and/or surface water regardless of the volume of water and regardless of whether this flow is due to flood waters from storms. Refer to Section 01566 for additional information on the site's hydrology.

3.2 SEDIMENTATION, EROSION AND TURBIDITY CONTROL

A. The Contractor shall take every precaution to minimize and control erosion and turbidity within the project limits. These precautions shall be subject to approval by the Engineering Consultant who will be at the site to observe critical portions of the work. Sedimentation, erosion, and turbidity control precautions shall include, but not necessary be limited to, the following:

1. Stockpiles of excavated materials as well as exposed slopes shall be kept to minimum gradients whenever possible. If these surfaces are to be exposed for more than two weeks, or are subject to heavy rainfall, they will be treated with straw, mulch, netting, grass seed or combination of the above to slow down the rate of surface run-off and to reduce the volume of suspended solids in the runoff water.
2. Compost Filter Socks shall be staked in place down gradient from all exposed borrow areas or materials storage areas in order to reduce the amount of suspended solids in runoff water as generally depicted on the Drawings. The exact location of the erosion barriers will be determined in the field, as work progresses.
3. Silt Fences shall be installed and maintained during construction activity where indicated on the Contract Drawings, at minimum. The Contractor may provide additional controls elsewhere at their discretion at no additional cost to the Owner.
4. Compost Filter Socks and Silt Fences shall be installed with wooden stakes in accordance with manufacturer's directions and as shown on the Drawings.
5. Regulatory agencies reserve the right to determine the adequacy of the erosion control measures during construction. All inadequate devices, as determined by these governmental bodies or their agents, shall be replaced with devices deemed adequate, at the Contractor's expense.

3.3 GENERAL SEDIMENT AND EROSION CONTROL PLAN AND CONSTRUCTION SEQUENCE

A. Creating a project specific construction sequence with respect to proper handling of water, sediment and erosion control particularly at the beginning stages and throughout construction of the proposed development is of critical importance. Final details for such shall be determined by the Contractor as part of their means and methods. However, the Contractor responsible for the construction will be contractually obligated to fulfill all applicable provisions of the Town of Stratford conditions, state and federal permits and the Contract Drawings and Specifications.

B. A Proposed Sediment, Erosion Control, Site Access, and Laydown Plan is included on Drawing C-101. Erosion and Sediment Control Details are included on Drawing C-302. Erosion and Sediment Control Narrative is included on Drawing C-303. Construction period Best Management Practices (BMPs) including erosion control barriers shall be used to mitigate against the erosion and discharge of on-site sediment.

C. Once all construction work is complete, the Contractor shall disassemble all temporary BMPs and complete site restoration as per the Drawings. The disturbed areas shall be restored and disturbed vegetated areas shall be re-seeded as specified in other sections applicable to that work.

3.4 INITIAL CONSTRUCTION ACTIVITIES AND PRELIMINARY DRAINAGE CONTROL

A. Prior to beginning any dewatering, clearing, stockpiling, excavation or filling, the Contractor shall perform the following sequence of implementation of sedimentation and siltation control measures.

1. Perform all necessary work to install all anticipated sedimentation barriers including but not necessarily limited to compost filter socks, silt fence, silt sacks, erosion control blankets, pumped water filter bags, stabilized construction access, and other items as necessary. Provide all necessary sedimentation and siltation control measures as required by the Engineer, Owner and regulatory agencies to minimize sedimentation or siltation from occurring beyond the immediate limits of work.

2. In addition to initial sedimentation and siltation control set-up measures, take additional steps as necessary to minimize sedimentation and siltation within work areas and eliminate sedimentation and siltation outside of work areas throughout the conduct of the Work at no additional cost to the Owner.

3. Following initial setup of sediment and erosion controls, the site shall be inspected by the Owner, Engineer, and other environmental agencies having jurisdiction. No work can continue until the Temporary Erosion and Sediment Controls meet the approval of said entities.

4. Damaged or loose compost filter socks, silt fence, or other control features shall be replaced as necessary to maintain their function of controlling sedimentation and siltation. Damaged or broken dewatering sumps, damaged or sediment filled pumped water filter bags or other items installed for sedimentation and siltation control shall be replaced immediately.

B. Remove any accumulation of silt or soil build-up behind compost filter socks and silt fences as it occurs. Remove accumulations of silt and soil build-up from siltation sumps and silt traps as necessary to properly maintain their function.

C. Following periodic cleaning of all sedimentation controls and upon completion of the use of the controls, the accumulated sediment shall be allowed to dry prior to transporting to lawful off-site upland disposal locations. Costs of said disposal shall be included as part of the price stated on the Bid Proposal Form.

D. The Contractor shall repair any damage resulting from sedimentation or siltation during subsurface exploration program and related activities and restore property to its prior condition at no additional cost to the Owner.

3.5 ADDITIONAL EROSION AND SEDIMENTATION CONTROLS

A. The Engineer will make periodic inspections of the site and advise the Contractor of the need for additional erosion and sedimentation controls necessary to meet the performance standards of this Section. Representatives of the Owner and of regulatory agencies may also make similar inspections.

B. Additional erosion and sedimentation control necessary to deal with transient conditions on the site, such as following the placement of topsoil but prior to the establishment of grass cover, shall be provided by the Contractor as needed and at no additional cost to the Owner.

3.6 INSPECTION AND MAINTENANCE

A. In addition to the Conditions specified in the permits, the Contractor shall also undertake the following:

B. Throughout the entire duration of the Contract (including periods when on actual site work is being conducted), the Contractor shall perform weekly inspections of erosion and sediment control installations. Additional inspections shall be required immediately after each rain event exceeding one-half inch (0.5”). The Contractor shall develop a checklist to assist with periodic inspection and maintenance and shall keep completed copies of the checklist for each inspection on file along with the sediment and erosion control plan.

C. Throughout the duration of the Contract (including periods when on actual site work is being conducted), the Contractor shall repair any damage resulting from sedimentation or erosion during construction and/or construction related activities and restore property to its prior condition at no additional cost to the Owner.

D. Throughout the duration of the Contract (including periods when on actual site work is being conducted), the Contractor shall take such steps as are necessary to maintain the sediment and erosion controls in good working order, including repair or replacing controls and cleaning or removing sediment from controls.

E. The site entrance(s) shall be maintained in a condition that will prevent tracking or flow of mud onto public right-of-way. All materials spilled, dropped, washed, or tracked from vehicles onto the public roadways or into on- or off-site storm drains must be removed immediately.

F. In the event of inclement weather, the Contractor shall protect the site and materials from damage or injury from the weather. If, in the opinion of the Owner or its Engineer, any portion of the Work or materials has been damaged by reason of failure on the part of the Contractor to so protect the Work, such Work and materials shall be removed and replaced with new materials and Work to the satisfaction of the Owner. Weather protection shall include all activities necessary to prevent the spread of sediment from wind, runoff, erosion, and other causes.

3.7 REMOVAL AND CLEANUP

A. At the end of the contract work, and after each site has been fully stabilized against erosion, remove sediment control devices and accumulated silt. The Contractor shall dispose of accumulated silt materials legally off-site.

B. Dispose of legally off-site all other sedimentation and siltation control devices such as, but not limited to compost filter socks, filter bags, sandbags, stakes, construction site access (stabilized construction access) materials, and all other related products. Any sediment control materials, including sandbags, etc., which have been dislodged or otherwise transported into the stream, pond or adjacent wetland resource areas must also be recovered and removed from the site.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Payment for Contract Item 01560.1 TEMPORARY EROSION AND SEDIMENT CONTROLS will be paid for based on the Lump Sum price stated for Item No. 01560.1 on the Bid Form for all temporary erosion and sediment control work as specified herein and as indicated on the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; planning, submittals, and coordination; installation, maintenance, and documentation of erosion and sediment controls and the approved erosion and sediment control plan; Silt Fences, Erosion Control Socks, Silt Sacks, Stabilized Construction Entrances Straw Bales, Erosion Control Blankets, Filter Bags, Temporary Seed and Turf Establishment for Erosion Control, and other items required for E&SC; coordination with regulatory agencies, facilitation of regulatory site inspection visits and participation at meeting; periodic and as-needed cleaning, repair, replacement, or improvement of controls; storage; recovery of displaced controls; disposal; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

4.2 PAYMENT

A. Partial payments for Contract Item 01560.1 TEMPORARY EROSION AND SEDIMENT CONTROLS shall be provided as follows: Sixty percent (60%) of lump sum bid price upon completion of installation and approval by the Owner's Consultant and permitting agencies/representatives having jurisdiction. Following the satisfactory completion of work, forty percent (40%) of lump sum bid price will be paid upon removal and cleanup of Temporary Erosion and Sediment Control items as required.

ITEM NO.	PAYMENT ITEM	UNIT
01560.1	TEMPORARY EROSION AND SEDIMENT CONTROLS	LUMP SUM

END OF SECTION

SECTION 01566

SUBSURFACE, HYDRAULIC, AND HYDROLOGIC DATA

(FOR INFORMATIONAL PURPOSES ONLY)

PART 1. GENERAL

1.1 GENERAL, PURPOSE, AND INTENT OF DATA

A. The Owner's Engineer has compiled the data referenced and contained herein regarding certain subsurface, hydraulic, hydrologic, and as-built information pertaining to the Stratford WPCF, along with data on climate in the area. This information is presented **FOR INFORMATION ONLY**. Neither the Owner nor the Engineer makes any assurances as to the accuracy of the information depicted or referenced in this section. The Contractor is responsible for making their own assumptions, interpretations, and conclusions based on the data presented herein. The Contractor may, at their own expense, make additional evaluations, investigations, and studies to confirm the information presented herein at no additional expense to the Owner. If the Contractor chooses to perform additional subsurface explorations, obtain prior permission from the Owner.

B. Review pertinent data for the site, including the following.

1. Hydrologic, and hydraulic data are included in the permit applications referenced in Section 01060. Permit applications may be made available upon written request from the Owner.

2. Exploration locations, subsurface exploration logs, Geotechnical and Environmental Data Reports included in **Attachment A2**:

   a. "Geotechnical Engineering and Environmental Data Report, Stratford Water Pollution Control Facility, 105 Beacon Point Road, Stratford, Connecticut", dated February 20, 2023, prepared by GZA GeoEnvironmental, Inc.

   b. "Supplemental Analytical Data Report, Stratford Water Pollution Control Facility (WPCF) Perimeter Flood Wall Improvements, Stratford, Connecticut 06115", dated January 29, 2026, prepared by GZA GeoEnvironmental, Inc.

3. Prior construction drawings included in **Attachment A3:**

   a. Plan set by Charles A. Maguire & Associates, Inc., entitled "Town of Stratford, Connecticut – System of Sewers – Contract No. 2 – Construction of Secondary Treatment Facilities at Stratford Water Pollution Control Plant," dated 1970 (1970 C.A.M. Drawings).

   b. Plan set by CE Maguire, Inc., entitled "Town of Stratford, Connecticut – Hurricane Protection for Water Pollution Control Plant – Contract No. 12," dated 1974 (1974 C.E.M Drawings).

   c. As built plan set by Camp Dresser & McKee Inc., entitled "Town of Stratford, Connecticut – Contract No. 06-01 – Water Pollution Control Facility Upgrade," dated March 2006, As built drawings revised August 23, 2010 (2010 CDM Drawings).

C. Aforementioned data is for general information and is accurate only at the particular locations and times the data was collected or evaluated, in accordance with limits of the methods employed. It is the Contractor's responsibility to make interpretations and draw conclusions based on the conditions and

character of materials to be encountered and the impact on his work based on his expert knowledge of the area and of construction techniques. Additional Limitations are included in the above-referenced data sources.

PART 2. PRODUCTS

[Not Used]

PART 3. EXECUTION

[Not Used]

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. No measurement or payment shall be made of any work performed under this section. No separate payment shall be made for any work performed under this section. The cost of any work done or facilities provided under this section shall be included under other bid items within the Contract.

END OF SECTION

SECTION 01740

SITE RESTORATION

PART 1. GENERAL

1.1 SCOPE

A. The work under this Section shall consist of all work and operations, including, but not limited to equipment, supplies, material, personnel, and incidentals to restore areas in and around the project site to pre-construction conditions.

B. The intent of the Work of this Section is that areas which are disturbed as a result of the overall Work of this Contract, whether intentionally or unintentionally, planned or unplanned, are restored to, at, or better than their conditions prior to the start of work. The Scope of Work under this Section shall also include both significant and incidental work necessary to repair damage to the site beyond those areas shown as disturbed on the Contract Drawings. Areas to be restored shall include, but not be limited to laydown and storage areas, construction access ways, public and private roadways, etc. Facilities to be restored include the temporary staging areas, laydown and stockpile areas, and grassed or other vegetated areas. Additionally, restoration shall include private property areas, if disturbed.

C. It is the intent of the Contract that the Contractor avoid and minimize indirect construction impact to the maximum extent possible. To this end, the site and surrounding areas should be protected, as needed and as provided for under separate Sections of the Contract. The Contractor should also develop a plan to protect the site and inform and educate their forces regarding protective measures to be implemented. This Section covers the restoration of damage caused by unavoidable or inadvertent actions by the Contractor's forces, including all sub-contractors, material deliverers, and others under the Contractor's employ or authority. It is the intent of the Contract that the work of this Section be minimized to the extent possible by the Contractor's actions to avoid damage to the site and area.

D. The Work of this Section will involve satisfactory completion of Punch List items to the satisfaction of the Owner.

1.2 DOCUMENTATION OF EXISTING CONDITIONS

A. Project Location: Access to the general and immediate project Site location is via Birdseye Street and Beacon Point Road, in Stratford, which are paved public streets. Additionally, temporary construction access along the southern side of the Site is via the Animal Shelter Driveway, which is an existing paved driveway that continues from the southern end of Beacon Point Road.

B. Temporary Construction Laydown and Storage Area: This area is located on an area of existing lawn on the WPCF property, within the proposed limit of disturbance, to the southwest of the intersection of Birdseye Street and Beacon Point Road, as indicated on the Contract Drawings. Proposed stabilized construction access to this area is located off an existing, paved, facility access road identified as Access Drive and as indicated on the Contract Drawings.

C. Prior to the start of work, the Contractor shall be responsible for documenting the pre-construction conditions of these and all other areas which might be disturbed by the Work of the Contract, including but not limited to areas within the proposed limit of disturbance; the temporary construction laydown and storage area; Birdseye Street, Beacon Point Road, Animal Shelter Driveway, Access Drive, North

Road, and South Road; grassed and otherwise vegetated areas; existing riprap and revetment slopes; nearby public and private property; utilities; and other site and surrounding features. This documentation, in the form of photographs, video tapes, and written documentation shall be provided to the Owner if requested. This documentation shall be used to determine the extent to which post-construction site restoration shall be needed.

1.3 PROTECTION OF EXISTING FEATURES

A. The Contractor shall take such steps and measures as are necessary to protect the project site and adjacent areas from damage by construction activities and thereby minimize the extent of work to be done under this Section. Site protection shall be paid for under the Scope of other Sections.

PART 2. PRODUCTS

2.1 GENERAL

A. Products used in Site Restoration shall meet the requirements of the applicable Section of the Contract Documents. If work similar to the nature of the necessary site restoration is not specified elsewhere in the Contract Documents, the applicable section of the State of Connecticut, Department of Transportation Standard Specifications (latest edition) shall control. Materials for restoration of utilities shall meet with the standards of the Owner or the utility to be restored.

PART 3. EXECUTION

3.1 GENERAL

A. The work required and services for site restoration shall be done in a safe workmanlike manner and shall conform to any pertinent local or state law, regulation or code. Good housekeeping consistent with safety shall be maintained. The Contractor shall be responsible for all necessary permits and approvals.

3.2 PRE-CONSTRUCTION SITE DOCUMENTATION

A. Prior to the start of work at the site, the Contractor shall coordinate with the Owner and its Engineer to perform a pre-construction site walk for the purposes of documenting conditions prior to disturbance by the Contractor's forces and equipment. A representative from the Owner and/or its Engineer will accompany the Contractor during the site walk, but it shall be the Contractor's sole responsibility to properly document existing conditions in all areas which might be subject to disturbance. The Contractor shall use photographs, video, written descriptions, sketches, and any other means to document pre-construction conditions. If requested, the Contractor shall supply the Owner with one copy each of the documentation, including both hard copies and digital files, as appropriate. The Owner alone shall be empowered to make decisions about the pre-construction condition of areas not covered by the Contractor's documentation.

3.3 RESTORATION METHODOLOGY

A. Means of Site Restoration shall meet the requirements of the applicable Section of the Contract Documents. If work similar to the nature of the necessary site restoration is not specified elsewhere in the Contract Documents, the applicable section of the State of Connecticut Department of Transportation Standard Specifications (latest edition) shall control. Proper sediment, erosion, and water control shall be provided, as needed, at no additional cost.

B. In addition to restoration of items specified herein or other Sections, items requiring further restoration will be identified as Punch List items to be completed before the final acceptance of the Work.

3.4 RESTORATION OF ROADS

A. The Contractor shall be required to repair any damage to roadways, driveways, walkways, or other access ways; paved or unpaved; curbing; markings; signage; lights; and other related and appurtenant features caused during the course of construction, in order to return the roads to pre-construction condition, or better, as necessary to incorporate and transition proposed improvements into existing areas to remain, as indicated on the Contract Drawings, and as directed by the Owner or the Owner's Representative.

3.5 TEMPORARY CONSTRUCTION LAYDOWN AND STORAGE AREA

A. The Contractor shall be prepared to repair any damage to any area which will be used as construction staging, laydown, storage, access, and stockpile area. These areas shall be restored to their pre-construction condition or better. Restoration is likely to include clean up to remove any and all materials, trash, and debris resulting from its use during the work, as well as grading of the site to smooth out any disturbances made during the work. The Contractor shall be required to repair any damage to this area as well as the entrance area where it meets the existing sidewalk and roadway caused during the course of construction, in order to return the area to pre-construction condition or better.

3.6 RESTORATION OF VEGETATED AREAS

A. The Contractor shall be responsible for restoring all vegetated areas beyond the indicated limits of work disturbed during the work of this Contract. The intent is to restore disturbed or damaged areas to pre-construction condition or better. Restoration of vegetated areas shall include, but not be limited to, loam placement, regrading, seeding, mulching, and maintenance. Loaming, seeding, and revegetation of areas which are shown on the plans as being excavated, filled, graded, to be restored with seed to lawn, or established turf shall be paid for under Section 02930 Loaming, Seeding, and Revegetation. Loaming, seeding, and revegetation of other areas and beyond the limits indicated on the Contract Drawings, including areas disturbed by construction traffic, trailer placement, material stockpiling, etc. shall be considered incidental to the items for which the disturbance and restoration are required and included in the contract price for those items.

B. Existing and proposed vegetated areas within the limits of proposed clearing, grubbing, and stripping as indicated on the Contract Drawings shall receive loam and seed to lawn in accordance with Section 02930. Disturbance of areas beyond the limits of proposed clearing, grubbing, and stripping but within the limits of disturbance as indicated on the Contract Drawings shall minimized to the extent necessary to perform the Work and restored in-kind to replicate pre-construction conditions. The Contractor shall be responsible for maintenance and care of all restored vegetated areas until vegetation is thoroughly re-established and subject to the acceptance of the Owner.

3.7 TREES

A. The Contractor shall be responsible for pruning and other actions necessary to repair construction-related damage to trees which are shown to remain in place or are outside of the clearing and grubbing areas, as required, and as indicated on the Contract Drawings.

B. The Contractor shall hire a certified arborist to perform restoration work on large trees, if judged necessary by the Owner.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. There shall be no separate measurement or payment for the Work of this Section. The work of this Section shall be considered incidental to other Contract Items for which restoration work may be required. Compensation for such work shall be included in the payment items for which the incidental restoration work is required or Section 01900 Mobilization/Demobilization.

END OF SECTION

SECTION 01900

MOBILIZATION/DEMOBILIZATION

PART 1. GENERAL

1.1 DESCRIPTION

A. The work under this Section shall consist of the Contractor's preparatory work and operations, including, but not limited to transporting equipment, supplies, personnel and incidentals to the work site, and all other operations which must be performed or for costs which must be incurred prior to the commencement of the work.

B. Work under this Section shall also include **all** work, services, equipment and other incidental items, whether specifically mentioned herein or not, to perform similar tasks at the work site at the conclusion of the work, in order to restore the site to its intended condition and remove all items which are not a permanent part of the work from the site, and to leave the site in a clean and orderly manner to the satisfaction of the Engineer and as directed by the Owner.

1.2 EXISTING CONDITIONS

A. Access to the general and immediate project Site location is via Birdseye which is a paved public residential street. Construction laydown, staging and stockpile areas for all work shall be located within the limits of disturbance and grading, in the areas designated for these purposes, and as indicated on the Contract Drawings, unless otherwise allowed by the Owner.

B. The Contract Drawings specifically delineate the proposed limits of disturbance and grading. Areas located outside of these limits are not to be disturbed. The Contractor shall be strictly monitored for compliance with these boundaries. Proper mobilization/demobilization of equipment, tools, etc., as well as environmental and housekeeping procedures by the Contractor are of highest priority.

C. The Contractor shall be prepared to provide working platforms/ramps, cribbing, shoring, matting, and all other specialized support equipment required to minimize impact to wetland resource areas, and to ensure safe access of all personnel, equipment and materials necessary for completion of the work of this Contract in accordance with the Specifications and Drawings.

D. The Contractor is strongly encouraged to become intimately familiar with respective access and other issues at the Site during the Pre-Bid Meeting process to better develop a comprehensive work plan and a more informed bid. No additional coordinated site visits will be allowed beyond the Pre-Bid Meeting unless specifically approved by the Owner.

1.3 SCHEDULE AND SEQUENCE

A. The Contractor shall conduct the work of the Contract on as continual a basis as possible.

B. Certain weather conditions (such as an extended period of very heavy rainfall and/or an abnormal weather event such as a hurricane) could cause a significant rise in the depth of surface water and groundwater levels. Therefore, the Contractor shall establish their mobilization/demobilization bid price accordingly in order to maintain all necessary equipment to be able to rapidly demobilize from work areas and protect the work, if necessary.

C. In the event of an emergency demobilization action the Contractor shall take all necessary measures to protect the work in progress and replace at his own expense all work, materials and equipment lost or damaged as a result of an emergency action.

D. No separate payment will be made for Temporary or Emergency Demobilization and Remobilization as a result of adverse weather conditions.

1.4 BONDS AND INSURANCE

A. Cost for Payment and Performance Bonds as well as Insurance and other similar features required as part of the Contract shall be covered under the cost of this Section as applicable.

PART 2. PRODUCTS

[Not Used]

PART 3. EXECUTION

3.1 GENERAL

A. The work required and services for Mobilization/Demobilization shall be done in a safe workmanlike manner and shall conform to any pertinent local or state law, regulation or code. Good housekeeping consistent with safety shall be maintained.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. The bid items for Mobilization/Demobilization are lump sum quantities. Progress payments may be requested by the Contractor at the proportions and schedule indicated herein, or as modified per the Contractor's proposed Schedule of Values, subject to receipt of the Owner's acceptance in writing.

B. No additional payment shall be made for any necessary temporary Demobilization and Remobilization.

4.2 PAYMENT ITEMS

A. The price bid for Mobilization/Demobilization shall not exceed ten percent (10%) of the total contract bid price.

B. Payment for Contract Item 01900.1 MOBILIZATION/DEMOBILIZATION will be paid for based on the Lump Sum price stated for Item No. 01900.1 on the Bid Form. Mobilization/Demobilization costs for all work under the Contract not specifically addressed on the Bid Form or included in the cost of other Payment Items shall be considered incidental, and the costs for such shall be included as part of the work of that Section (and included in the respective Schedule of Values price items) and/or as part of the work of this Contract.

C. Partial payments for Contract Item 01900.1 MOBILIZATION/DEMOBILIZATION shall be provided as follows: Sixty percent (60%) of lump sum bid price upon completion of mobilization. Following the satisfactory completion of work, forty percent (40%) of lump sum bid price will be paid upon completion of the Final As-Built survey and Final Record Drawings of the final site conditions (by a professional

surveyor licensed in the State of Connecticut - refer to Section 01050 for additional information), completion of all Site Restoration and Punch List items, receipt and acceptance of all other required closeout and record documentation, and demobilization.

ITEM NO.	PAYMENT ITEM	UNIT
01900.1	MOBILIZATION/DEMOBILIZATION	LUMP SUM

END OF SECTION

SECTION 02065

DEMOLITION, REMOVAL, AND DISPOSAL

PART 1. GENERAL

1.1 DESCRIPTION

A. This Section describes the general parameters and requirements for dismantling, relocation, demolition, removal, off-site stockpiling and lawful off-site disposal of certain existing materials and structures at the Project Site.

B. The work of this section shall include removal of existing material which may be re-used as part of the final project configuration.

C. The Contractor shall obtain all necessary permits, including local, state, and federal permits, coordinate all required inspections with appropriate agencies, and conduct all work in accordance with all local, state, and federal rules, regulations, and guidance.

D. If necessary, excavation support systems required for the work of this Section shall be in accordance with the requirements of Specification Section 02300.

E. It is the intent of the Contract that suitable existing soil and rock generated from the Work be re-used by the Contractor in the Work and as part of the final project configuration to the maximum extent practical and economically feasible.

F. Refer to Specification Section 02760 Pipeline Abandonment for additional requirements for abandoning existing buried pipes.

1.2 SCOPE OF WORK

A. The scope of the work of this Section shall include the demolition, removal, abandonment, handling, storage, and disposal of specified existing Site features and Unclassified Materials as indicated on the Contract Drawings, as required to complete the Work, and as directed by the Engineer.

1. The term Unclassified Materials shall refer to existing debris generated from excavation that are non-hazardous but are not suitable for reuse in the Work and are not identified by the Owner for salvage. Such Unclassified Materials shall be separated from soil and other forms of demolition debris by the Contractor using acceptable mechanical or manuals methods prior to their removal from the Site.

2. Unclassified materials shall not include substantial quantities of soil, rock, or natural materials generated from clearing, grubbing, and stripping operations; construction-related waste materials or rubbish, excess construction materials; grout and concrete washout; bituminous concrete pavement or curb; chain link fence and gate components and concrete foundations; vehicle guide rail components; or other materials for which disposal is incidental to the work of other Items. Minor residues that remain adhered to debris at the end of handling and processing may be included at the discretion of the Engineer.

B. The scope of the Work of this Section shall also include the demolition, chipping, sawcutting, preparation, protection, handling, storage, and removal of existing pavements, curbing, fences, utilities, and other structures or features as indicated on the Contract Drawings, and as required to complete the Work.

C. At the Contractors discretion, existing chain link fence and roadway guiderail components may be salvaged and stored on-Site for potential re-use in the Work. The suitability of existing materials proposed by the Contractor for re-use shall be assessed by the Owner and Engineer. Any materials found to be damaged, deformed, in excess of required quantities, or otherwise unsuitable for re-use in the Work or part of the final project configuration shall become property of the Contractor and the Contractor shall promptly remove and lawfully dispose of the material off-Site at no additional cost to the Owner

D. Any other materials specifically requested to be salvaged by the Owner shall be relocated by the Contractor to a facility within 25 miles of the Site, as requested by the Owner and at no additional cost to the Owner. All other material becomes property of the Contractor and must be lawfully disposed of off-site.

E. The removal and disposal of all other miscellaneous materials at the job site, including timber, trash, wood chips, mulch, vegetation, waste, excess construction materials, and other materials not specified herein shall be considered incidental to the Work of other Sections.

F. The Contractor shall be responsible for coordinating the Work of this Section with other Work of the Contract and the Contractor's proposed construction schedule as required.

1.3 SALVAGE

A. Debris resulting from demolition activities shall be segregated and recycled to the greatest extent possible. Salvage value accrues to the Contractor, except in cases where material is specifically reserved by the Owner.

B. Material that the Owner does not request to be salvaged and is scheduled for permanent removal (not to be restored) shall become the property of the Contractor and shall be properly and legally disposed of at a facility authorized to receive such materials for disposal at no additional cost to the Owner, unless indicated otherwise herein.

C. Material salvaged for the Owner by the Contractor shall be handled with care so as to not damage the material, to the extent possible. Material salvaged for the Owner shall be transported and placed in a designated storage location on-Site, or to a facility located within 25 miles of the site, at no additional cost to the Owner. Materials that might be designated for salvaging by the Owner or for reuse in this project include but are not limited to existing chain link fence and gates; roadway guardrail; signage; site lighting; castings, covers, grates, hydrants, meters, and monuments; valves and pipe; riprap, rock, excavated soils, and other earthwork materials; portable equipment and structures; and other miscellaneous materials.

1.4 PROJECT CONDITIONS

A. Explosives: Blasting and use of explosives is not permitted.

B. Burning: Burning on site is not permitted.

C. Protection: The Contractor shall prevent injury to persons and damage to abutting property. The Contractor shall further provide adequate shoring and bracing to prevent uncontrolled collapse and immediately repair damaged property to its condition prior to being damaged.

D. The Contractor shall carefully examine all of the Contract Documents for requirements that affect the work of this Section. Certain construction, systems, or equipment identified in the Contract Documents or by the Engineer in the field shall remain in-place for future service and shall be protected.

E. The Contractor shall immediately repair, to the satisfaction of the Engineer, any damage directly and indirectly caused by the Contractor's operations at no cost to the Owner.

F. The Contractor shall remove and legally dispose of all clearing debris, demolition debris, and solid waste from the Site. No on-site disposal of stumps shall be allowed. On-site recycling or reuse of demolition debris, including brick, concrete, and asphalt, is not allowed, except where specifically authorized by the Specifications or by the Resident Engineer.

G. The Contractor shall dispose or recycle all demolition debris in accordance with all applicable laws and regulations and the requirements of the Contract Documents.

1.5 RELATED SECTIONS

01010	SUMMARY OF WORK
01060	REGULATORY REQUIREMENTS
01100	SPECIAL PROVISIONS
01110	ENVIRONMENTAL PROTECTION PROCEDURES
01300	SUBMITTALS
01500	TEMPORARY FACILITIES AND CONTROLS
01560	TEMPORARY EROSION AND SEDIMENT CONTROLS
01740	SITE RESTORATION
01900	MOBILIZATION / DEMOBILIZATION
02110	CLEARING, GRUBBING, AND STRIPPING
02300	EARTHWORK
02315	SOIL MANAGEMENT PLAN
02373	RIPRAP
02510	BITUMINOUS CONCRETE PAVEMENT
02660	DUCTILE IRON PIPE AND FITTINGS
02665	VALVES AND APPURTENANCES
02710	UNDERDRAIN SYSTEM
02760	PIPELINE ABANDONMENT
02820	CHAIN LINK FENCE AND GATES
02840	VEHICLE GUIDE RAILS

1.6 SUBMITTALS

A. At least two weeks prior to performing any demolition work, the Contractor shall submit a Work Plan detailing procedures, equipment, sequences of operations, and schedule to perform the demolition activities called for in this Section and related Sections of this Specification and as indicated on the Contract Drawings. The Work Plan shall include the name, contact information, and qualifications of any subcontractors assisting with or conducting the demolition. The Work Plan submission shall also include

descriptions of proposed procedures, product information, and equipment specifications for supporting of excavation sidewalls, bracing or falsework to temporarily support structures being demolished, partially demolished, or abandoned and prepared for improvement or restoration. The Work Plan shall include descriptions of proposed utility coordination, protection, relocation, bypass, service interruptions, pipe and structure abandonment, and other Work of this Section potentially affecting utilities. If necessary, the Work Plan shall also include the name, location, and owner of the off-site disposal facility accepting the demolition debris.

B. Submit weight slips attested to by a sworn weigher from the authorized facility receiving loads for disposal. This documentation shall be required and submitted for payment of any contract item paid per ton under this Section.

PART 2. PRODUCTS

[Not Used]

PART 3. EXECUTION

A. The Contractor shall determine means and methods for all dismantling and demolition tasks specified as part of the Work, subject to the restrictions contained in this specification and subject to approval by the Owner or Engineer.

B. Erect, and maintain temporary barriers and security devices including warning signs and lights, and similar measures, for protection of the public, Owner, Contractor's employees and existing improvements to remain.

C. Protect the remaining portions of the Site as well as adjacent structures, landscaping, utilities, and other features of the Site that are not to be demolished.

D. Take all steps necessary to prevent movement or settlement of adjacent fill, other existing structures, and utilities.

E. Perform erosion and sediment control in accordance with Section 01560 Temporary Erosion Controls.

F. Existing buried utility structures and pipe proposed for demolition and removal (D&R) shall be excavated and removed entirely to the limits indicated on the Contract Drawings, as required, and as directed by the Engineer. The ends of existing pipes and penetrations of existing structures to remain shall be plugged at the limit of their removal in accordance with Section 02760 Pipeline Abandonment.

G. The Contractor shall perform earthwork associated with D&R in accordance with Section 02300 and related Sections of this specification.

H. Existing buried pipeline and structure abandonment shall be in accordance with Section 02760 Pipeline Abandonment.

I. The Contractor shall coordinate with the Owner regarding the transport and stacking of the salvaged material to remain and stored at the property of the Owner. The Engineer will provide the Contractor with the address of the off-Site facilities, if any, where salvaged material shall be delivered.

J. The Contractor shall separate Unclassified Materials, as defined in this Section, from soil and other forms of demolition debris by suitable mechanical or manual methods. The Contractor shall notify the Engineer

at least 24 hours prior to hauling loads of Unclassified Materials off-Site for disposal. The Engineer shall assess the contents of the loads for compliance with this Section prior to removal from the Site. The Contractor shall provide a means of individually identifying each load and matching that load to its corresponding weight slip, such as by load number.

1. If any load prepared for disposal as Unclassified Material is found to contain excessive quantities of other materials not meeting the required characteristics, in the opinion of the Engineer, the Contractor shall either continue processing the materials until they are satisfactorily separated or dispose of the load at the Contractor's own expense.

K. Temporarily store Unclassified Materials separately on-Site in approved dumpsters or other containment and dispose of the Unclassified Materials at an authorized off-Site facility.

L. The Contractor shall provide the Engineer with weight slips attested to by a sworn weigher from the authorized facility receiving loads for disposal. This documentation shall be required and submitted for payment of any item paid per ton.

M. The Contractor shall conform to applicable laws and regulations when hazardous or potentially hazardous materials or contaminated substances not previously identified are encountered. Contractor is directed not to disturb or attempt to remove any discovered hazardous or potentially hazardous materials or contaminated substances without first notifying Owner or Engineer. Immediately notify Owner or Engineer upon the discovery of such conditions.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Measurement and payment for Contract Item 02065.1 BURIED PIPE REMOVAL shall be made at the contract unit price per linear foot of miscellaneous buried pipe demolished, removed, and disposed of by the Contractor, as required, and to the limits indicated on the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; excavation and backfill; cutting; removal of existing pipe; plugging the ends of pipe and structure penetrations at the limits of removal; off-Site disposal; protection; repair; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

B. There shall be no separate measurement and payment for excavation, backfilling, other earthwork, plugging the ends of existing pipe to remain, or plugging penetrations in existing structures to remain required to complete the work of this Section. This work shall be considered incidental and included in the price of Contract Item 02065.1.

C. Measurement and payment of Contract Item 02065.2 UNCLASSIFIED MATERIAL DISPOSAL shall be made at the contract unit price per ton of Unclassified Material encountered within excavation and satisfactorily free of soil and rock, removed from the Site, and disposed of at an authorized off-Site facility as required. This price shall include full compensation for all for all survey; supervision; equipment; labor; materials; handling; storage; excavation and backfilling; dumpsters; hauling; weighing; disposal; and any other incidental or appurtenant work required to dispose of Unclassified Material as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work. Measurement for payment shall be based on

submitted weight slips attested to by a sworn weigher for loads of Unclassified Material received and accepted for disposal by an authorized facility.

D. There shall be no separate measurement or payment under this Section for off-Site soil disposal or disposal of materials or demolition work incidental to or included for payment under other Contract Items.

4.2 PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
02065.1	BURIED PIPE REMOVAL	LINEAR FOOT
02065.2	UNCLASSIFIED MATERIAL DISPOSAL	TON

END OF SECTION

SECTION 02110

CLEARING, GRUBBING, AND STRIPPING

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall furnish all labor, material, tools and equipment and perform all operations necessary to cut and clear trees; remove surficial debris; grub primary roots; remove stumps and surficial stones including riprap and revetment stone; clear the site; strip topsoil prior to other excavation work; on-Site processing, separation, and storage of topsoil (loam) and riprap and revetment stone for suitable reuse in the Work.

B. The Work shall consist of clearing, grubbing, stripping, removal and lawful off-site disposal of all vegetation, roots, stumps, surficial debris and unsuitable spoil from proposed areas of construction within the limits of Work as shown on the Contract Drawings.

C. The Contractor shall conduct work in a manner that preserves and protects all vegetation to remain and objects designated by the Engineer. Areas of existing vegetation including but not limited trees, shrubs, and grass located within the limit of disturbance, but are not specifically identified on the Contract Drawings as "Area of Proposed Clearing and Grubbing" shall be disturbed by the minimal extent necessary to perform the Work and Restoration as required.

D. Clearing, Grubbing, and Stripping shall be performed at portions of the Site to complete the Work as indicated on the Drawings. "Area of Proposed Clearing and Grubbing," as indicated on the Contract Drawings, shall be understood to also include stripping of loam and topsoil and recovery of riprap and revetment stone, where it is encountered. Clearing, grubbing, and stripping shall be required at temporary construction laydown and material storage areas (staging areas) as indicated on the Contract Drawings.

E. The Owner may pre-mark certain trees within the project area which are NOT to be cut or otherwise disturbed. The Contractor shall survey and mark out limits of tree clearing for the Owner and coordinate with the Engineer regarding this effort and then shall protect the marked trees from harm.

1.2 SCOPE

A. The general scope of all clearing, grubbing, and stripping shall be to execute all work necessary to prepare all areas on the site for further earthwork (excavation or filling), demolition, or other construction. The Contractor shall clear, grub, and strip all areas where construction shall take place as shown on the Contract Plans, as well as any other areas necessary for the work of the Contract (with approval from the Engineer). Contractor shall perform ALL necessary clearing, grubbing, and stripping at all locations on the site, irrespective of the basic descriptions provided below:

1. Clearing and Grubbing shall encompass all Work necessary to remove all trees, vegetation, stumps, and roots from the proposed embankment fill areas and slopes, riprap and revetment slopes, floodwall areas, staging areas, and other necessary locations as shown on the Drawings.

2. Trees and vegetation outside the limit of disturbance shall NOT be cleared, grubbed, or otherwise disturbed.

3. Stripping shall encompass all Work necessary to remove organic-containing topsoil from proposed demolition and construction locations and other locations as necessary to accomplish the work and as shown on the Drawings.

4. The typical minimum depth of stripping shall be six inches (6”); except that all topsoil (at the surface or buried) shall be completely removed when encountered within areas to receive additional fill; and areas below new or relocated structures, pavement, and riprap; as required, as indicated on the Contract Drawings, or as directed by the Engineer. This depth may be varied based on the extent of topsoil and root penetration, as required, and as directed or approved by the Engineer. The depth of existing topsoil to be stripped may be necessary on some portions of the Site. Areas outside the limit of disturbance shall NOT be stripped or otherwise disturbed.

5. Backfill of excavations, including stumping, shall be in accordance with Section 02300.

6. Reuse of existing topsoil (or loam) shall be in accordance with Sections 01740 and 02930.

7. Reuse of existing riprap and revetment stone shall be in accordance with Section 02300.

1.3 REQUIREMENTS

A. All Work shall comply with all codes, rules, regulations, laws, and ordinances of the Town of Stratford, Connecticut, the State of Connecticut, and all other authorities having jurisdiction within the Work area.

B. All Work shall commence only after respective sedimentation and erosion control measures are in place to the satisfaction of the Owner and its Engineer in accordance with Section 01560 of these Specifications. The Contractor remains solely responsible for the suitability and adequacy of any of the sedimentation and erosion control materials, methods, and procedures.

C. The Contractor shall not burn trees, brush, stumps, and other ignitable materials.

D. The Contractor shall obtain permission from the Engineer prior to using storage areas within the Site boundaries for collection or stockpiling of surficial debris, stone, and/or topsoil. Stockpiles shall only be in areas shown on the Contract Drawings or as approved by the Engineer.

E. Any clearing beyond the boundary limits shall not be permitted without express permission from the Owner. Prior to any clearing, the limits of tree clearing shall be marked out by a Professional Land Surveyor licensed in Connecticut.

F. The Contractor shall make all arrangements necessary for the legal disposal of trees, stumps, surficial debris, unsuitable spoil, and other material collected during Site clearing, grubbing and stripping. Debris materials shall be temporarily stockpiled at an approved on-Site location and lawfully disposed of off-Site prior to project completion.

G. Timber cleared from the site may be salvaged by the Contractor for any other lawful off-Site uses.

H. Topsoil stripped from the Site shall be processed, segregated, and stored separately from other materials on-Site and reused on-Site by the Contractor in grassed areas or as final treatment of stockpile and staging/laydown areas, or legally disposed of off-Site.

I. The Contractor is advised that existing topsoil materials suitable for reuse shall meet the requirements of Loam (or Topsoil) Sections 02930.

1.4 RELATED SECTIONS

01010	SUMMARY OF WORK
01100	SPECIAL PROVISIONS
01300	SUBMITTALS
01560	TEMPORARY EROSION AND SEDIMENTATION CONTROL
01740	SITE RESTORATION
01900	MOBILIZATION / DEMOBILIZATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02300	EARTHWORK
02315	SOIL MANAGEMENT PLAN
02930	LOAMING, SEEDING, AND REVEGETATION

1.5 SUBMITTALS

At least ten days prior to the work of this Section, submit to the Owner for review and comment a plan showing the boundaries of all areas to be cleared, grubbed, and stripped, and showing the locations of proposed stockpiles. Indicate in the submittal the sediment and erosion control measures which will be implemented on and around the stockpiles. Indicate means and methods of clearing and grubbing and of accessing areas to be cleared and grubbed. Indicate stockpile areas and means of placement which will minimize re-handling. Indicate sequencing, if any. Indicate off-site disposal locations, along with any required permits which the Contractor or disposal facility is required to obtain.

PART 2. PRODUCTS

[Not Used]

PART 3. EXECUTION

3.1 PREPARATION

A. The Contractor shall confirm with the Engineer those areas to be cleared, grubbed, and stripped and the location for the stockpiles for materials.

B. The Contractor shall coordinate with the Owner to identify and protect trees which will NOT be cleared from the site. These trees shall be prominently marked by the Contractor.

C. The Contractor shall locate, identify and protect sensitive areas (especially wetland areas, protected trees, forest areas, and any utilities) from damage during work.

D. The Contractor shall protect benchmarks, survey control points, valves and other controls, existing geotechnical instrumentation, existing structures, and other Site features to remain from damage or displacement.

E. The Contractor shall install erosion and sedimentation controls in accordance with Section 01560 prior to Clearing, Grubbing, and Stripping activity.

3.2 CLEARING, GRUBBING, AND STRIPPING

A. The Contractor shall clear, cut, or otherwise remove all trees and vegetation from the indicated areas. Identified trees and trees and vegetation outside the indicated areas shall be protected.

B. The Contractor shall remove surficial debris, vegetation, stumps, roots, and obstructions including topsoil, which will affect excavation and embankment operations on the Site. This shall include grubbing of all stumps and major subsurface root systems where roots exceed a quarter of an inch in diameter.

C. The Contractor shall place all surficial debris and unsuitable material into on-Site stockpiles for off-Site disposal at an approved disposal location by the Contactor. Transportation and disposal will be performed at the Contractors convenience after approval of the material for disposal and location of disposal, but prior to completion of Site Restoration and request for final payment. Temporary stockpiling shall be performed as required herein, in accordance with related Sections, as indicated on the Contract Drawings, and as directed by the Engineer.

D. The Contractor shall screen and/or otherwise treat stripped topsoil which is intended for re-use as loam. Topsoil to be reused as loam shall meet all requirements and testing for loam set forth in Section 02930 prior to re-use on-site. Excess soil materials from the clearing and stripping processes may be permanently stockpiled in designated on-Site areas with the prior approval of the Owner.

E. No on-site burning is allowed. The Contractor may chip cleared trees and stumps to create wood chip mulch. This material shall be transported off-Site for lawful disposal unless directed for on-Site reuse by the Engineer. The Owner may have use for some portion of the material and shall be allowed to remove quantities not used on-Site by the Contractor. The remaining material shall be lawfully disposed of off-Site by the Contractor. This work shall be considered incidental and the cost shall be included in the price bid for this item.

F. No additional payment will be made for moving of stockpiles or re-handling of material. The stockpiles shall be sited, placed, and graded in such a way as to minimize re-handling necessary.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Measurement and payment of Contract Item 02110.1 CLEARING, GRUBBING, AND STRIPPING shall be made at the contract lump sum price to perform the corresponding clearing, grubbing, and stripping to the limits indicated on the Contract Drawings and as required herein. This price shall include full compensation for all for all survey; supervision; equipment; labor; materials; masonry and cementitious materials; handling; storage; processing; disposal; and any other incidental or appurtenant work as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work. No measurement shall be made for payment of this item. Payment shall be made at the contract lump sum price for the proportion of the item satisfactorily complete and accepted.

4.2 PAYMENT

A. Payment for the scope of the work specified herein, including all labor, materials, equipment and incidentals and mobilization/demobilization costs to clear, grub, and strip vegetation and soil materials from embankments and other areas necessary to facilitate the work and as shown on the Contract Drawings.

ITEM NO.	PAYMENT ITEM	UNIT
02110.1	CLEARING, GRUBBING, AND STRIPPING	LUMP SUM

END OF SECTION

SECTION 02300

EARTHWORK

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.

B. State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, Form 819.

C. American Association of State Highway and Transportation Officials (AASHTO) Standards:
   1. AASHTO T 27 - Sieve Analysis of Fine and Coarse Aggregates.

D. American Society for Testing and Materials (ASTM) Standards:
   1. ASTM C136 - Method of sieve analysis of fine and coarse aggregates.
   2. ASTM C117 - Standard test method for materials finer than No. 200 sieve in mineral aggregate washing.
   3. ASTM D1140 - Test for amount of material in soils finer than the No. 200 sieve.
   4. ASTM D1557 - Test methods for moisture-density relations of soils and soil aggregate mixtures using 10 lb. hammer and 18-inch drop (Method C). AASHTO Standard T-180 may be substituted for ASTM D1557.
   5. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
   6. ASTM D2922 - Test methods for density of soil and soil-aggregate in place by nuclear methods (shallow depth).
   7. ASTM D4318 - Test method for liquid limit, plastic limit and plasticity index of soils.
   8. ASTM D6913 - Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis
   9. ASTM D7928 - Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

E. Occupational Safety and Health Administration (OSHA):
   1. Regulations, 29 CFR Part 1926 - Including, but not limited to, Excavations and Excavation Support, Current Revision.

F. Related Work Specified Elsewhere
   1. Section 01560- Temporary Erosion and Sediment Controls
   2. Section 01566 - Subsurface, Hydraulic, And Hydrologic Data
   3. Section 02373 – Riprap
   4. Section 02710 – Under Drain System

1.2 SUMMARY

A. Provide facilities, labor, materials, tools, equipment, appliances, transportation, supervision, and related work necessary to complete the work specified in this Section, and as shown on the Drawings. The work of this Section includes but is not necessarily limited to:
   1. Preparing subgrades for footings, utilities, dikes, flood walls, retaining walls, pavements and other structures as shown on the drawings.
   2. Excavating and backfilling for dikes, flood walls, retaining walls, utility trenches, utility structures, footings, and other structures, and to achieve the finish grades as shown on the drawings.
   3. Clearing, grubbing and stripping topsoil and existing rip rap from the existing earthen dike flood protection and proof compacting the underlying Impervious Fill.
   4. Placement of new Impervious Fill below the proposed concrete flood walls and to raise the earthen dike flood protection.
   5. Construction of gabion retaining walls.
   6. Installation of geotextiles.
   7. Construction of concrete flood walls and their deep foundations.
   8. Construction of the dike and flood wall underdrain system.
   9. Construction of deployable flood gates and storage facilities.
   10. Placement of topsoil and seed for site restoration.
   11. Placement of rip rap on flood side of the dike and flood wall.
   12. Raising and resetting grates, covers, or other castings to finished grade.
   13. Installation of sheeting, shoring or other lateral earth support measures, as required.
   14. Excavation and off-site disposal of unsuitable and excess materials and stockpiling of suitable onsite materials required for reuse.
   15. Providing labor, equipment and materials and performing operations in connection with legally collecting, removing, handling and discharging groundwater and surface water encountered during construction.
   16. Supplying, transportation and placement of all required fill and backfill materials.
   17. Providing drainage and dewatering required to perform work in the dry.
   18. Conducting all work in accordance with OSHA requirements and other applicable laws and regulations, and with the requirements of all federal, state, and local agencies and authorities having jurisdiction over the work.
   19. Coordinating earthwork activities with all other project and Stratford Water Pollution Control Facility (WPCF) activities.

B. The Contractor is alerted to special job site conditions:
   1. The high silt content of the on-site soils make these soils sensitive to moisture content, and susceptible to frost. Wet conditions from direct precipitation or groundwater and freezing temperatures will cause the soils to be easily disturbed when subjected to earthwork equipment. At moisture contents above or below optimum (plus or minus 2%) compaction to specified densities will be difficult to achieve without proper moisture conditioning or dewatering.
   2. Crushed stone or free-draining material shall not be used within the dike or below the concrete flood wall unless shown on the Contract Drawings, or with written approval from the Engineer.
   3. Adding water to overly dry soils or drying (using special measures such as discing or harrowing) overly wet soils will be required to properly compact the material according to the specifications herein.
   4. When exposed during wet weather conditions or when below groundwater, subgrades shall be protected. The protection shall be up to the Contractor, with review by the

Engineer, and may consist of a layer of Granular Fill, Pervious Structure Backfill, Crushed Stone (with non-woven filter fabric separating the Crushed Stone from all surrounding soils) or lean concrete (mud mat), depending on the work location.

5. Working with the on-site soils, especially during the winter and spring seasons is often time-consuming and can cause construction delays. With this hereby noted, the Contractor shall not be compensated for any delays or extra costs associated with any special measures required in properly handling the soils described herein to perform the Work of this Contract according to the Specifications.
6. The Site is located at the Stratford Water Pollution Control Facility which will remain open and active during construction of the Flood Protection System Improvement project. All construction work must be coordinated with Stratford WPCF to maintain operations. The Contractor shall not be compensated for any delays or extra costs associated with any special measures required to perform the Work of this Contract according to the Project Documents.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill. Borrow soil shall not be contaminated or recycled.

E. Drainage Course: Aggregate layer that minimizes upward capillary flow of pore water.

F. Owner: Town of Stratford

G. Engineer, Owner's Agent, Testing Agency and Geotechnical Engineer: Owner's Representative and the review team for submittals required herein.

H. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
   1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Geotechnical Engineer and the Owner's Agent. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
   2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Owner's Agent. Unauthorized excavation, as well as remedial work directed by the Owner's Agent, shall be without additional compensation.

I. Fill: Soil materials used to raise existing grades.

J. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material and concrete that exceed 1 cu. yd. for bulk excavation or 3/4 cu. yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to

the following in size and performance ratings, without systematic drilling, ram hammering, or ripping:

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch- wide, maximum, short-tip-radius rock bucket; rated at not less than 138-hp flywheel power with bucket-curling force of not less than 28,700 lbf and stick-crowd force of not less than 18,400 lbf with extra-long reach boom; measured according to SAE J-1179.
2. Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp flywheel power and developing a minimum of 47,992-lbf breakout force with a general-purpose bare bucket; measured according to SAE J-732.

K. Structures: Footings, foundations, flood walls, deployable flood gates, dikes, retaining walls, slabs, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

L. Subbase Course: Aggregate layer placed between the subgrade and base course.

M. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase.

N. Unsuitable Fill (Soil): Existing Fill which is unsuitable for support of proposed structures. Also refer to the Soils Management Plan for further definition of Unsuitable Fill.

O. Unsuitable Fill (Concrete): Existing concrete or masonry foundations that exceed 1 cu. yd. for bulk, footing, trench, and pit excavation that cannot be removed by rock excavating equipment defined above.

P. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

A. Product Data: For each type of the following manufactured products required:
1. Subsurface drainage geotextile including separation fabric, filter fabric, geogrids, or similar geotextiles.

B. Samples for Verification: For the following products, in sizes indicated below:
1. 12 by 12-inch sample of geotextile fabric with specification analysis.

C. Qualification Data: For qualified testing agency.

D. Pre-excavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces, which might be misconstrued as damage caused by earth moving operations. Submit at least one week before earth moving begins.

E. Flowable Fill Mix Design: Submit mix design with admixture information for review and approval a minimum of 15 days prior to start of Work.

F. The Contractor shall submit the following to the Owner:

1. Proposed schedule, sequence, procedures and equipment for all earthwork including descriptions of all methods, operations and equipment proposed for excavation, sheeting and shoring, subgrade preparation, backfilling and compaction.
2. Details of compaction equipment.
3. Shop Drawings: Submit detailed shop drawings and calculations, to be reviewed by the Owner, of applicable earthwork procedures and sequences.

G. Site Characterization of Off-Site Borrow Sources: The following information shall be submitted to Engineer for review at least two weeks prior to use of an off-site borrow source:
1. Location and name of the borrow source site.
2. Owner and contact information for the borrow source site.
3. Present and past usage of the source site and materials.
4. Any previous existing report(s) associated with an assessment of the source site as it relates to the presence of oils, hazardous materials, or other organic and non-organic constituents which may be considered contaminants.
5. Location within the site from which the material will be obtained.
6. Physical Analysis: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated. Prepare separate reports for each type and application of borrow material.
   a. Classification: ASTM D2487.
   b. Gradation Analysis (Sieve Analysis): ASTM D6913.
   c. Moisture and Density Relationship Curve (Modified Proctor Analysis): ASTM D1557.
7. Impervious Fill: In addition to the physical analysis testing above, provide at least one falling head permeability test (ASTM D5084) for each borrow source and at least one test for reuse of the Impervious Fill excavated from the existing dike.

H. Imported soils shall consist of virgin, naturally deposited borrow sources and shall not contain brick, asphalt, concrete and other manmade materials.

I. Existing Utility Protection: Provide adequate means of support and protection of utilities to remain in place during earthwork operations. Provide design submittal(s), support requirements, plans, and details for support/protection systems, stamped by a Connecticut PE, for review and comment by the Engineer.

1.5 QUALITY ASSURANCE

A. Earthwork Observation and Testing:
1. The Owner and/or Owner's Agent will retain a qualified geotechnical engineer and/or testing agency to perform onsite observation and testing during work under this and related sections and as indicated in the "Schedule of Special Inspections." The services of the Geotechnical Engineer/testing agency may include, but not be limited to, the following:
   a. Observation during excavation, subgrade preparation and backfill for retaining walls, flood walls, footings, dikes, and subsurface utility and drainage construction, etc.
   b. Determination of requirements for additional excavation to remove unsuitable materials.
   c. Observation and testing during placement and compaction of fill and backfill.

d. Providing modifications to dike and flood wall design based on actual conditions encountered.
e. Review of submittals.

2. During the course of construction, the Geotechnical Engineer/Testing Agency shall advise the Owner's Agent, in writing, with a copy to the Architect and Contractor, if at any time, in their opinion, the work is not in substantial conformity with the plans and specifications. The Geotechnical Engineer's and/or Testing Agency's presence does not include supervision or direction of the actual work by the Contractor, their employees, subcontractors or agents. Neither the presence of the Geotechnical Engineer and/or Testing Agency, nor any observations and testing performed by them shall excuse the Contractor from defects discovered in their work.
3. Testing equipment will be provided by and testing performed by the Geotechnical Engineer and/or Testing Agency, except as otherwise provided by contract. Upon request by the Owner's Agent, the Contractor shall provide such auxiliary personnel and services as needed to accomplish testing work and to repair damage caused thereby to permanent work.
4. References herein to observations, testing and determinations by the "Engineer" include services to be provided by the Geotechnical Engineer and/or Testing Agency when appropriate and authorized by the Owner.

B. Pre-excavation Conference: Conduct conference at Project site.
1. Before commencing earthwork, meet with representatives of the governing authorities, Owner, engineer, consultants, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least one week prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

1.6 PROJECT CONDITIONS

A. Work is being completed at an active Water Pollution Control Facility and all reasonable measures shall be taken to limit disturbance to workers, deliveries, and or traffic at the WPCF and the public. Available laydown and parking areas are limited and shall be as shown on the Contract Drawings. If additional parking and or laydown areas are needed, a written request shall be provided to the WPCF. No guarantee is made that additional work areas shall be granted.

B. All Site disturbance shall be restored to pre-construction conditions, or better, unless otherwise noted on the Plans.

C. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth moving operations.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

D. Existing Utilities:
   1. Notify utility locator service for area where project is located before site clearing or excavating. Hire private utility mark out service for areas not marked by utility companies.
   2. Before starting excavation, establish location and extent of any underground utilities occurring in work area. Make arrangements with appropriate utility company for removal and relocation of lines which are in the way of excavation. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations. If the existing utility is below the excavation depth, locate the utility using vacuum excavation or other means to verify the utility depth and location to avoid damaging the utility.
   3. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult utility owner immediately for direction. Cooperate with Owner, Owner's Agent, and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner at no additional cost to the Owner.
   4. Inactive or abandoned utilities encountered during construction operations shall be removed, plugged or capped. The location of such utilities shall be noted on record drawings and reported in writing to Owner's Agent. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shutoff services if lines are active.
   5. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by Owner and then only after arranging to provide acceptable temporary utility services. Provide minimum of 48 hours' notice to Owner and receive written notice to proceed before interrupting any utility. Do not proceed with utility interruptions without Owner's written permission.
   6. When in the course of the work it is necessary to connect a utility to a main in a public way, all the requirements of both the authorities governing the utility and those governing the public way shall be met. Pavement shall be temporarily and permanently replaced as directed by these authorities at no additional cost to the Owner.

E. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shutoff services if lines are active.

F. Site Information:
   1. Information in the contract plans and Specifications, relating to subsurface conditions, existing utilities and structures is from the sources presently available. Such information is furnished only for the information and convenience of the Contractor, and the accuracy and completeness of this information is not guaranteed. The Owner will not be responsible for interpretations or conclusions drawn from this data by the Contractor.
   2. Geotechnical and environmental reports have been prepared for this Project and are available in the supplemental information that is made available for information only. The opinions expressed in the reports are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data. The Contractor may, at their own expense and upon application to the Owner, conduct additional subsurface explorations and testing.

G. Do not commence earth moving operations until temporary erosion- and sedimentation-control measures specified in the contract documents are in place.

H. Permits, Codes and Safety Requirements:
1. Comply with all rules, regulations, laws and ordinances of the Municipality, State, Federal, and all other authorities having jurisdiction over the project site. All labor, materials, equipment and services necessary to make the work comply with such requirements shall be provided by the Contractor without additional cost to the Owner.
2. Comply with the provisions of the Manual for Accident Prevention in Construction of the Associated General Contractors of America, Inc., and the requirements of the Occupational Safety and Health Administration, United States Department of Labor.
3. The Contractor shall abide by the conditions of all relevant permits issued to the Project. The Contractor alone shall be responsible for meeting the conditions of the permits and shall be held accountable for penalties as a result of violations of permit conditions.

1.7 LAYOUT AND GRADES

A. Lay out all lines and grades not presently established at the site in accordance with the drawings and specifications. Establish permanent benchmarks determined by a Land Surveyor registered in Connecticut. Maintain all benchmarks and replace as directed any which are destroyed or disturbed.

B. The term “finished grade” as used herein shall mean the required final grade elevations indicated on the Drawings. Where not otherwise indicated, project site areas outside of buildings shall be given uniform slopes between such points and existing established grades.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations. All rock and soil materials furnished for use as fill or backfill shall be free of grease, soil, solvents, pesticides, herbicides or other hazardous or deleterious materials and/or contaminants. All rock and soil materials specified in this Section shall also be free from ice, snow, trash, debris, stumps, roots and organic material. Imported soil materials containing brick, asphalt, concrete and other manmade materials including recycled materials shall be excluded from use at the Site.

B. Crushed Stone Filter Material: Material for use in the toe drain shall conform to CONNDOT Form 819, Division II Section 3.05 and Division III Section M.01.01, M.01.03 and M.01.04. Naturally or artificially graded non-plastic mixture of durable, sound coarse and fine aggregate and obtained from suitable excavated onsite soils or offsite sources. Mixture to be free of debris, waste, frozen materials, and organics, and shall be well graded within the following limits:

SQUARE MESH SIEVES	PERCENT FINER BY WEIGHT
3/8 Inch	100
No. 4	95-100
No. 8	80 - 100
No. 16	50 - 85

No. 30	25 – 60
No. 50	10 - 30
No. 100	2 - 10

C. No. 4 Crushed Stone: Crushed stone for use as riprap bedding layer and as otherwise detailed on the drawings shall be a quarry product or washed gravel stone obtained from offsite sources. Crushed stone shall consist of durable crushed rock or gravel stone essentially free of silt, clay, loam or other deleterious materials and shall conform to CONNDOT Form 819, Division III Section M.01.01, No. 4 and the following gradation requirements for the nominal size indicated

SQUARE MESH SIEVES	PERCENT FINER BY WEIGHT
2 Inch	100
1-1/2 Inch	90 - 100
1 Inch	20 - 55
3/4 Inch	0 - 15
3/8 Inch	0 - 5

D. Processed Aggregate Base: Base material for use below pavements shall consist of CONNDOT Form 819, Division III, Section M.05.01, Processed Aggregate Base. Naturally or artificially graded non-plastic mixture of durable, sound coarse and fine aggregate and obtained from suitable excavated onsite soils or offsite sources. Mixture to be free of debris, waste, frozen materials, and organics, and shall be well graded within the following limits (processed stone, no gravel):

SQUARE MESH SIEVES	PERCENT FINER BY WEIGHT
2-1/2 Inch	100
2 Inch	95 - 100
3/4 Inch	50 - 75
1/4 Inch	25 - 45
No. 40	5 - 20
No. 100	2 - 12

E. Subbase: Subbase material for use as pavement subbase course and other uses as detailed shall consist of CONNDOT Form 819, Division III, Section M.02.06, Grading B and be obtained from suitable excavated onsite soils or offsite sources. Subbase shall consist of a non-plastic mixture of durable, sound coarse and fine aggregate and shall be well graded within the following limits:

SQUARE MESH SIEVES	PERCENT FINER BY WEIGHT
5 Inch	100
3-1/2 Inch	90-100
1-1/2 Inch	55 - 95
1/4 Inch	25 - 60
No. 10	15 - 45
No. 40	5 - 25
No. 100	0 - 10
No. 200	0 - 5

F. Granular (Structural) Fill (modified): Material shall be obtained from suitable excavated onsite soil or offsite borrow sources for use as fill and backfill, except where other materials are specified or detailed, and shall conform to CONNDOT Form 819, Division II Section 2.13 and 2.14

and Division III Section M.02.01 and M.02.06 and the gradation below. Naturally or artificially graded non-plastic mixture of durable, sound coarse and fine aggregate and obtained from suitable excavated onsite soils or offsite sources. Mixture to be free of debris, waste, frozen materials, and organics, and shall be well graded within the following limits:

SQUARE MESH SIEVES	PERCENT FINER BY WEIGHT
3-1/2 Inch	100
1-1/2 Inch	55 - 100
1/4 Inch	25 - 60
No. 10	15 - 45
No. 40	5 - 25
No. 100	0 - 15
No. 200	0 - 12

G. Impervious Fill (also Embankment Fill): Material shall be obtained from suitable excavated onsite soil or offsite borrow sources for use as fill to raise grades for the dike and flood wall and backfill excavations within the dike or below the flood wall, as specified on the Contract Drawings. Naturally or artificially graded non-plastic mixture of durable, sound coarse and fine aggregate and obtained from suitable excavated onsite soils or offsite sources. Mixture to be free of debris, waste, frozen materials, and organics, and shall be well graded within the following limits:

SQUARE MESH SIEVES	PERCENT FINER BY WEIGHT
3-Inch	100
No. 10	30 - 95
No. 40	20 - 70
No. 200	15 - 30

Impervious Fill shall be well graded with a coefficient of uniformity (CU) of 6 or above and shall not be gap graded. Additionally, Impervious Fill must have a hydraulic conductivity of less than 10^{-4} centimeters per second which will be evaluated using laboratory testing.

H. General Fill: Clean, sound mixture of soil material free of debris, waste, frozen materials and organics with not more than 12 percent passing the No. 200 sieve. The maximum size aggregate shall be 5 inches or 2/3 of the loose lift thickness, whichever is lower.

I. Flowable Fill: Mixture of cement, sand, water and admixtures to produce a flowable fill with a 100-psi maximum, 28-day compressive strength.

J. The Contractor can request the Engineer for approval to use onsite soils that do not meet the gradations above as Structural or Granular Fill. The requested onsite material must be able to be compacted to a firm and stable surface and meet the project compaction requirements. The Contractor is responsible for all costs and schedule delays associated with the reuse of these soils.

K. Riprap: refer to specification Section 02373 – Rip Rap.

2.2 GEOTEXTILE FABRIC

A. Nonwoven Geotextile Fabric: Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polypropylene, conforming to Mirafi 160N or equivalent, and installed as specified on the drawings.

B. Woven Geotextile Fabric: Woven geotextile, manufactured for soil stabilization and separation applications, made from polypropylene, conforming to Mirafi 600X or equivalent, and installed as specified on the drawings

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

D. Provide protective construction fence around all landscaping in work area to remain.

E. Provide protective construction fence around all work areas to prevent public access.

3.2 DEWATERING

A. Refer to Section 01565- Temporary Erosion and Sediment Controls and Section 02319- Temporary Water Control.

B. Protect subgrades and foundation soils from softening, undermining, washout, and damage by rain or water accumulation.
   1. Reroute surface water runoff away from excavated areas as feasible. Do not allow water to accumulate in excavations. The Contractor shall grade and ditch the site as necessary to direct surface runoff away from open excavations.
   2. The Contractor shall provide, at their own expense, adequate pumping and drainage facilities to keep all excavations and work sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction product or procedures nor cause excessive disturbance of underlying natural ground or footing subgrades. Contractor shall similarly control water entering the excavation as a result of construction operations, such as washing of concrete equipment and tools and the like.
   3. Water from trenches and excavations shall be disposed of in such a manner as will not cause injury to public health, nor damage to public or private property, existing work, or work in progress, nor to the surface of roads, walks and streets, nor cause any undue interference with the use of the same by the public. The Contractor shall comply with all applicable environmental protection and/or sediment/erosion control regulations.

4. Under no circumstances place concrete, backfill, or fill, or lay piping or install appurtenances in excavations containing free water.

3.3 EXPLOSIVES

A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not disintegrate or excavate rock until it has been classified by the Geotechnical Engineer and/or Owner's Agent and the Owner's surveyor has surveyed the rock surface. The Contract Sum will be adjusted for rock excavation according to contract provisions for changes in the Work.
   1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials not classified as rock or unauthorized excavation.
      a. Intermittent drilling; ram hammering; or ripping of material not classified as rock excavation is earth excavation.
   2. Rock excavation includes removal and disposal of rock and includes replacement with approved materials when required.
      a. Uncover and expose all rock surfaces to be removed.
      b. Notify owner in writing before rock removal proceeds.
      c. The Owner will engage a registered land surveyor to cross section the top of rock and determine the quantity of rock for payment. Measurements for payment will be based on in place cubic yards of rock removed to paylines, as defined:
         1) For Walls with Footings: The measurements will be taken horizontally parallel to and 12 inches outside of the edges of the concrete footings and vertically 12 inches below bottom of footing elevation as indicated in the Contract Documents.
         2) For Utility Trenches: The measurement will be taken vertically 6 inches below bottom of pipe and horizontally 24 inches wider than the nominal diameter of pipe/conduit as indicated in the Contract Documents.
         3) For Vaults, Manholes, Pits, etc.: The measurement will be taken horizontally 24 inches greater in both length and width or diameter than the actual exterior dimensions of the structures and vertically 12 inches below the bottom elevation of structure as indicated in the Contract Documents.
      d. No payment will be made for shattered layers below pay limits, associated removal and replacement with suitable fill material.

B. Dimensions:
   1. Excavate to elevations and dimensions indicated on the drawings or as otherwise required for the work. Do all necessary excavation, including but not limited to, excavation for structures, footings, foundations, paving, utility lines, mechanical work, mechanical and drainage structures, drains, and other below grade work. Excavate sufficient material so as to allow ample space for construction operations including placing and removal of forms, installation of waterproofing, damp proofing or utilities and inspection of excavated areas.

2. Side forms will be required for all concrete work unless omission of forms is requested by the Contractor, in writing, to the Engineer. Where omission of forms is requested by the Contractor, and accepted by the Engineer, the Contractor shall bear the cost of any additional concrete volume required beyond the minimum profiles and dimensions of the footing, wall, pier as detailed.

C. Disposition of Excavated Material:
1. Sort and stockpile excavated material according to its suitability for reuse and job requirements. Onsite stockpile room will be limited, and the contractor shall plan their operations to facilitate prompt reuse of excavated material or provide off-site stockpile locations (if offsite stockpile locations are approved) as required.
2. Stockpile soil materials without intermixing. Place, grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.
4. Offsite Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash and debris and legally dispose of these materials off the Owner's property.

D. Unauthorized Excavation: Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Engineer or Owner's Agent. Unauthorized excavation, as well as remedial work specified by the Engineer, shall be at the Contractor's expense.
1. Backfill and compact unauthorized excavations in accordance with this Section using material designated by the Engineer.
2. Where the excavation of otherwise suitable materials is required due to these materials being rendered unsuitable due to disturbance, construction activity, freezing or lack of protection from the elements, the Contractor shall excavate these materials and provide remedial work as specified above at no additional cost to the Owner.

E. Authorized Additional Excavation: In the case that unsuitable materials, as determined by the Engineer, are encountered at the specified subgrade elevation, the Engineer may direct the removal of the unsuitable material and refill with imported fill (Granular Fill, Impervious Fill, etc.) placed and compacted in accordance with the requirements of this Section. Authorized additional excavation and compacted backfill will be paid for according to contract provisions for changes in the Work.

F. Backfilling Prior to Acceptance of Work Installed:
1. Do not allow or cause the work performed or installed to be covered up or enclosed by work of this Section prior to all required inspections, tests and acceptances.
2. Should any of the work be so enclosed or covered up before it has been accepted, uncover all such work at no additional cost to the owner.
3. After the work has been completed, tested, inspected and accepted, make all repairs and replacements necessary to restore the work to the condition in which it was found at the time of uncovering, all at no additional cost to the owner.

G. Sheeting, Shoring, and Bracing:
1. Refer to Section 02150 – Excavation Support and Protection

2. Provide shoring and/or bracing at excavations as required to assure safety against collapse of earth at the sides of excavations; as required for support of adjacent foundations, structures, streets, utilities, and all other structures; or as required to comply with Federal, State or Local regulations, codes or ordinances.
3. Provide materials for shoring and bracing in good serviceable condition. Maintain shoring and bracing in excavations regardless of the time period excavations will be open. Carry down shoring and bracing as the excavation progresses.
4. Remove shoring and bracing as backfilling operations progress, taking all necessary precautions to prevent collapse of the excavation sides. Where shoring is required to be left in place as shown on the Drawings or as provided in these Specifications, no additional payment will be made.

H. Dust and Erosion Control:
1. The Contractor shall take all necessary measures and provide equipment and/or materials to minimize dust from rising and blowing across the site and also to control surface water throughout the operation so that it does not run onto paved ways without being filtered. In addition, the Contractor shall control all dust created by construction operations and movement of construction vehicles, both on the site and on paved ways.
2. Thoroughly moisten all surfaces as required to prevent dust from being a nuisance to the public, neighbors, and performance of other work on the site.
3. Repair any broken or damaged sections of hay bales or other erosion and siltation control measures damaged during excavation and grading operations and install any additional sections necessary for proper control.

I. Frost Protection and Snow Removal:
1. The Contractor shall, at their own expense, keep the operations under this contract clear and free of accumulations of snow or as required to carry out the Work.
2. Do not excavate to full indicated depth when freezing temperatures may be expected, unless footings and pile caps can be cast immediately after excavation has been completed. Protect the excavation from frost if placing of concrete is delayed. Do not cast concrete on frozen ground.
3. Completed foundations which have not been backfilled or which have less than 42 inches of earth cover above the bottom of the foundation shall be protected from freezing by temporary additional earth cover, insulating blankets, heaters or other methods.

J. Protection of Persons and Property:
1. The Work shall be executed in such a manner as to prevent any damage to adjacent property and any other property and existing improvements, such as but not limited to, streets, curbs, paving, service utility lines, structures, monuments, bench marks and other public and private property. Protect existing improvements from damage caused by settlement, lateral movements, undermining, washout, vibration and other hazards created by earthwork operations.
2. In the case of any damage or injury caused in the performance of the Work, the Contractor shall, at their own expense, make good such damage or injury to the satisfaction of and without cost to the owner. Existing roads, sidewalks and curbs damaged during the project work shall be repaired or replaced to their original condition at the commencement of operations. The Contractor shall replace, at their own expense, existing benchmarks, monuments and other reference points which are disturbed or destroyed.

3. Barricade open excavations occurring as part of this Work and post with warning lights. Operate warning lights during hours from dusk to dawn each day and otherwise as required.
4. Buried structures, utility lines, etc., including those which project less than 18 inches above grade, which are subject to damage from construction equipment shall be clearly marked to indicate the hazard.
5. Provide protective construction fence around all landscaping in work area to remain.

3.5 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
   1. General: Do not disturb bottom of excavation. Trim bottoms to required lines and grades to leave solid base to receive other work.
   2. If the excavation created by removal of these materials extends below the proposed subgrade elevation, over-excavate and replace any weak or unstable areas identified with material specified by the Geotechnical Engineer. Discontinue vibrations if disturbance or weaving of the subgrade is observed or as directed by the Geotechnical Engineer.

B. Subgrade Preparation for Pile Caps and Dikes:
   1. Remove existing pavement, topsoil, subsoil, fill, and former utilities from within the area to the top of the existing Impervious Fill. If the Impervious Fill is not found, excavate to the dimensions on the plans. Excavation to final subgrade should be performed with a smooth-edged bucket to reduce subgrade disturbance. Allow the Geotechnical Engineer to evaluate the subgrade for the presence of unsuitable materials. If unsuitable materials are encountered, over excavate until suitable bearing soils are encountered as determined by the Geotechnical Engineer.
   2. After existing topsoil, asphalt, riprap, organic silt and other non-dike fill material has been stripped and stockpiled, the existing Impervious Fill shall be proof compacted with at least 6 passes of a large vibratory drum roller with a minimum dynamic force of 3,000 pounds per foot of drum width. Any localized weak or unstable areas identified during proof compaction should be excavated and replaced with Impervious Fill. Proof compaction shall be observed by the Geotechnical Engineer. Discontinue vibrations if disturbance or weaving of the subgrade is observed or as directed by the Geotechnical Engineer.
   3. Subgrades are susceptible to disturbance from water and construction activities. For subgrades located below pile caps, subgrades shall be protected with a lean concrete mud mat.

C. Subgrade Preparation for Footings, Slabs-on-Grade, Retaining Walls:
   1. Remove existing pavement, topsoil, subsoil, fill, and former utilities from within the area and from within the zone of influence of foundations or structures. The zone of influence is defined by a line extending 1 foot horizontally from bottom of footing and then down at a 1 horizontal by 1 vertical line to the top of undisturbed naturally deposited soils. Excavation to final subgrade should be performed with a smooth-edged bucket to reduce subgrade disturbance. Allow the Geotechnical Engineer to evaluate the subgrade for the presence of unsuitable materials. If unsuitable materials are encountered, over excavate until suitable bearing soils are encountered as determined by the Geotechnical Engineer.

2. Proof compact all exposed subgrades with at least six passes of a vibratory plate with a minimum weight of 500 pounds or vibratory roller with a minimum dynamic force of 3,000 pounds per foot of drum width immediately prior to placement of fill material unless otherwise directed. Discontinue vibrations if disturbance or weaving of the subgrade is observed or as directed by the Geotechnical Engineer.
3. Subgrades are susceptible to disturbance from water and construction activities. Subgrades outside the dike limits shall be protected with 6 inches of Granular Fill, or at least 4 inches of ¾-Crushed Stone or a lean concrete mud mat. Wrap crushed stone in non-woven filter fabric where Crushed Stone is greater than 4-inches thick. If the subgrade soils become disturbed during construction, over-excavate the disturbed soils and replace with compacted Granular Fill.

D. Subgrade Preparation for Pavement and Flood Gate Storage Structures:
1. Existing fill and other deleterious materials (pavement, utilities, slabs, foundations, topsoil/subsoil, etc. if encountered) should be removed within 1.5 feet vertically of the proposed finished elevation. Prior to any fill placement, the subgrade soils should be proof compacted with multiple passes of a large vibratory drum roller having a minimum dynamic force of 5,000 pounds per foot of drum width under the observation of the Geotechnical Engineer. Any weak or unstable areas identified should be over excavated and replaced with compacted Structural Fill. Vibrations should be discontinued if disturbance or weaving of the subgrade is observed.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe, conduit or duct bank. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe, conduit or duct bank unless otherwise indicated.
1. Clearance: 12 inches each side of pipe or conduit unless otherwise indicated.

C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe and conduit elevation, unless otherwise indicated on Construction Documents, to allow for bedding course. Hand-excavate deeper for bells of pipe.
1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

3.7 PLACEMENT AND COMPACTION OF FILL AND BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:
1. Construction below finish grade.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring and bracing, and sheeting.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

C. All vegetation, peat, organic silt, topsoil or subsoil, trash, debris, roots, stumps, and any compressible or otherwise deleterious materials shall be stripped from the existing ground surface and removed from excavations prior to placement of fill or backfill.

D. All fill and backfill materials shall be placed in horizontal layers. Each layer shall be spread evenly and thoroughly mixed during spreading to ensure uniformity of material in each layer. Layer thickness shall not exceed that specified in this Section.

E. Where horizontal fill layers meet a natural or excavated slope, the layer shall be keyed into the slope by cutting a bench. The surface of benches shall be compacted to the same requirements as apply to the area being filled.

F. In no instance place fill over frozen materials or over ice or snow. In no case will frozen material be allowed for use in fill or backfill. Removal of such materials will be required as directed by the Engineer.

G. No fill shall be placed or compacted during unfavorable weather conditions. When work is interrupted by heavy rains or snow, fill operations shall not be resumed until the moisture content and density of previously placed fill are as specified hereinafter.

H. Allow the Geotechnical Engineer or testing agency sufficient time to make necessary observations and tests. The degree of compaction shall be based on a maximum dry density as determined by ASTM Standard D1557, Method C. All fill and backfill placed in various areas shall be compacted in individual layers to minimum dry densities as follows:
   1. Impervious Fill: 95 percent
   2. Under Structures, Equipment Pads, Slabs, and Pavements: 95 percent.
   3. Utility trenches – less than 3 feet from finish grade: 95 percent
   4. Utility trenches – more than 3 feet from finish grade (other than stone): 92 percent
   5. Under Walkways: 95 percent.
   6. Under Lawn or Unpaved Areas: 90 percent.
   7. Uniformly graded crushed stone materials which are not suited to field density testing shall be compacted to an unyielding surface and in accordance with the minimum compactive effort indicated in this Section.

I. The term "under," as applied to structures and paved areas, shall be construed to include all materials immediately below the plan area of the structure, as well as those materials within a line sloping at one vertical to one horizontal drawn downward and outward from the exterior of footings, structure foundations or paved areas.

J. Compaction shall be by mechanical means designed specifically for compaction and approved by the Engineer. The Engineer reserves the right to disapprove any device of inadequate capacity or of type unsuited to the character of the material being compacted. In areas which are too restricted to permit the use of mechanical compactors, fill may be placed in 3-inch layers and compacted by hand rammer or pneumatic tools.

K. Moisture Control:
   1. Water shall be added to fill material which does not contain sufficient moisture to be compacted to the specified densities. Fill and backfill material containing excess moisture shall be required to dry prior to or during compaction to a moisture content not greater than two percentage points above optimum except that material which displays

pronounced elasticity or deformation underfoot or under load shall be required to dry to optimum moisture content before it is placed and compacted, if that is required to achieve specified compaction. At the Contractor's option, material which is too wet may be removed and replaced with satisfactory material at no additional cost to the owner.

2. The Contractor is alerted to the potential silty nature of the onsite soil which renders them sensitive to moisture. Onsite silty soils are difficult to handle and compact and are easily disturbed when wet. The Contractor shall plan and conduct his excavation and filling operations considering the nature of the onsite materials.

L. Where the Engineer determines that fill or backfill does not conform to the compacted density specified, or did not receive the minimum compactive effort specified, such fill shall be removed and replaced with conforming materials at the Contractor's own cost.

M. Backfilling of Walls:

1. Do not use equipment weighing more than 5,000 lbs. within 10 feet of all walls. Do not use equipment weighing more than 300 lbs. within 3 feet of all walls.
2. Backfill shall be placed concurrently on all sides of walls, each lift being compacted on all sides before successive lifts are placed.

3.8 DISTURBANCE OF EXCAVATED AND FILLED AREAS DURING CONSTRUCTION

A. The Contractor shall take the necessary steps to avoid disturbance of subgrade during excavation and filling operations. Methods of excavation and filling shall be revised as necessary to avoid disturbance of the subgrade, including restricting the use of certain types of construction equipment and their movement over sensitive or unstable materials, dewatering and other acceptable control measures. The Contractor shall cooperate with the Engineer to modify his operations as necessary to mitigate disturbance and protect bearing soils, based on the Engineer's observations.

B. All excavated or filled areas disturbed during construction; damaged by freezing temperatures, frost, rain, accumulated water, or construction activities; all loose or saturated soil, and other areas that do not meet compaction requirements as specified herein shall be removed and replaced with the compacted fill materials specified. Costs of removal of disturbed material and refill with compacted fill shall be borne by the Contractor.

3.9 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, water, and ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits and duct banks.

C. Backfill voids with satisfactory soil while removing shoring and bracing.

D. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Coordinate backfilling with utilities testing.

F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.10 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
   1. Provide a smooth transition between adjacent existing grades and new grades.
   2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
   1. Turf or Unpaved Areas: Plus or minus 1 inch.
   2. Walks: Plus or minus 1 inch.
   3. Pavements: Plus or minus 1/2 inch.

3.11 SUBBASE AND BASE COURSES UNDER PAVEMENTS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
   1. Shape subbase course and base course to required crown elevations and cross-slope grades.
   2. Place subbase course and base course of 6 inches or less compacted thickness in a single layer.
   3. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
   4. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry density according to ASTM D 1557 Method C.

C. Pavement Shoulders: Place shoulders along edges of subbase course and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layer to not less than 95 percent of maximum dry density according to ASTM D 1557 Method C.

3.12 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified Geotechnical Engineer or testing agency to perform the following special inspections:
   1. Observe and document subgrade preparation prior to fill placement in structural areas.
   2. Observe and document fill placement within structural areas.
   3. Determine if the frequency and results of the compaction tests comply with the specification requirements.

B. Testing Agency: Owner will engage a qualified material testing agency to perform tests and inspections.

C. Allow testing agency to observe and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, each soil stratum will be verified by a Geotechnical Engineer to confirm subgrade preparation and ability to support design bearing capacities. Perform proof-compaction of subgrades in the presence of the Geotechnical Engineer.

E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, ASTM D 2937 and ASTM D 3017, as applicable.
   1. When field in-place density tests are performed using nuclear methods, make calibration checks for both density and moisture gages at the beginning of work and at intervals as directed by the Engineer.

F. Tests will be performed at the following locations and frequencies, subject to the discretion of the Geotechnical Engineer and/or Testing Agency.
   1. Dikes: At each compacted backfill layer, at least one test for every 1,000-square feet of backfill, but no less than two tests on each lift.
   2. Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet or less of wall length, but no fewer than two tests along a wall face.
   3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.
   4. Paved Areas and Walks: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
   5. Trench Backfill and Base: At each compacted backfill layer, at least one test for every 150 feet or less of trench length, but no fewer than two tests.

G. When subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.13 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   1. Scarify or remove and replace soil material to depth as directed by Geotechnical Engineer and/or Owner’s Agent; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.14 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment shall be based on the neat line dimensions and section geometry as indicated on the Contract Drawings.

B. There shall be no separate measurement or payment for quantities of existing fill or stone recovered, processed on-site, or otherwise reused in the Work or removed from the Site by the Contractor, which will be considered incidental to the Work of this Section.

C. There shall be no separate measurement or payment under this Section for excavation, grading, filling below the Impervious FIll, or any other work or materials incidental to the completion of and included in the price of other Contract Items.

D. No payment shall be made for quantities of materials not utilized in the construction of the project to meet established lines and grades as indicated on the Contract Drawings.

4.2 PAYMENT ITEMS

A. Payment shall be made at the contract unit price per cubic yard installed and complete to the lines and grades indicated on the Contract Drawings. This price shall include full compensation for all for all survey; supervision; equipment; labor; materials; testing; handling; storage; excavation; subgrade preparation; installation; recovery, salvage, processing, and reuse of existing materials; provision and installation of imported fill; grading; compaction; cleanup; restoration; disposal of waste or excess materials incidental or appurtenant work required to complete the construction; as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work of this Section which is not included in other items.

ITEM NO.	PAYMENT ITEM	UNIT
02300.1	IMPERVIOUS FILL	CUBIC YARD
02300.2	PROCESSED AGGREGATE BASE COURSE	CUBIC YARD
02300.3	NO. 4 CRUSHED STONE	CUBIC YARD
02300.4	GRANULAR FILL	CUBIC YARD
02300.5	GEOTEXTILE FABRIC	SQUARE YARD

END OF SECTION

SECTION 02315

SOILS MANAGEMENT PLAN

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.

B. Related Work Specified Elsewhere:
   1. Section 01560 – Temporary Erosion and Sediment Controls
   2. Section 02300 – Earthwork
   3. Section 02319 - Temporary Water Control

1.2 PURPOSE, BACKGROUND AND SCOPE

A. The purpose of this Soils Management Plan (SMP) is to define the program for handling, segregating, stockpiling, sampling and reusing or disposing of soil/material encountered during construction.

B. For the purposes of this SMP, it is assumed that, prior to construction, Site soils to be disposed of offsite will be pre-characterized and that based on pre-characterization, soil impacts will be known to the extent practical. Based upon these data, soils will be segregated based upon these impacts and managed accordingly as described in the SMP below.

C. The Site is not currently regulated under a Connecticut Department of Energy and Environmental Protection (CTDEEP) regulatory program. However, the Owner (Town of Stratford) expects soils at the Site to be used and managed in a manner generally consistent with industry standard practices and guidelines, including the CTDEEP Remediation Standard Regulations (RSRs) which provide compliance criteria for soil and groundwater.

D. This SMP is not intended to provide guidance regarding the requirements of the CTDEEP Release Based Cleanup Regulations (RBCRs) which have an effective date of March 1, 2026.

E. Soils in the Stratford Water Pollution Control Facility (WPCF) are the subject of this SMP. Limited pre-characterization sampling was performed by GZA at the WPCF for the project. Polychlorinated Biphenyls (PCBs) were detected above RSR criteria in a sample from test boring (GZ-2). Three additional test borings (GZ-101, GZ-102 and GZ-103) were completed, and environmental analytical testing was performed on the existing fill. Based on the test results, an area was delineated on the Project Drawings where the PCB Impacted Soils must be excavated, stockpiled, tested and disposed of offsite at a permitted facility.

F. The information presented in this Plan provides procedures/requirements for materials management during the project based on the current understanding of the Site and project parameters. The specific details and logistics for implementation of the SMP shall be the

responsibility of the Contractor. The Contractor will be responsible for the proper management and disposal of excavated material in accordance with applicable laws.

G. The scope of the SMP relates to the handling and management of at-grade and below-grade soils, water, and other materials encountered during construction. This Plan is not intended to be used for guidance relating to demolition, handling, removal, management, and disposal of buildings or other above-grade structures or materials.

1.3 RESPONSIBILITIES

A. Contractor(s)' responsibilities include:

1. All aspects of implementing the SMP including all costs associated with excavation, management, segregation and stockpiling of impacted and non-impacted soil and other excavated materials.

2. Compliance with the conditions of the CTDEEP General Permit for Contaminated Soil and/or Sediment Management. Note that this General Permit has expired and has not been reissued by CTDEEP. However, soil staging activities shall comply with the General Permit conditions.

3. Compliance with the conditions of the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. We note that based on the size of the proposed site disturbance area (<5 acres), registration under the permit will be required and a Stormwater Pollution Control Plan (SWPCP) will need to be developed and implemented for the project by the Contractor. The Contractor must adhere to SWPCP and follow the Connecticut Guidelines for Soil Erosion and Sediment Control and the Connecticut Stormwater Quality Manual. A copy of the SWPCP must also be provided, upon request, to the municipal planning commission, zoning commission and/or inland wetlands agency, or its respective enforcement officer or designated agent.

4. Determining the project schedule, construction sequencing, and other operational parameters of the project and communicating such information to the project team.

5. Overseeing all earth-related construction work for the project including installation and maintenance of soil erosion and sediment controls in accordance with the Sediment and Erosion Control Plan.

6. Establishing on-Site material stockpiling location(s).

7. Waste characterization sampling in accordance with the requirements of the approved waste disposal facility for any materials which will be shipped off site.

8. Compliance with the necessary environmental and non-environmental permits, approvals, authorizations, Site health and safety plan and all other applicable local, state, and federal health and safety standards for the performance of the construction work.

9. Providing all labor, materials, equipment, and other services required for handling, segregating, and stockpiling of materials encountered during construction.

10. Load, transport, and disposal of exported soils.

11. Dewatering will be required during the Project. The Contractor shall handle such water in a manner consistent with applicable general permit requirements that are identified in the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (Effective Date December 31, 2020) (if required by the Regulators) and the requirements of Section 02319 - Temporary Water Control.

12. Compliance with the conditions of the CTDEEP General Pretreatment Permit for Significant Industrial User, Dewatering, and Remediation Discharges (including treatment and/or disposal if dewatering of polluted groundwater to a POTW is necessary at the Site).

13. Compliance with the conditions of the CTDEEP General Permit for the Discharge of Groundwater Remediation Wastewater (including treatment and/or disposal if dewatering of polluted groundwater to surface water is necessary at the Site). We note that this General Permit expired in March 2025 and has not been renewed yet by CTDEEP. However, CTDEEP has indicated that the permit should be followed for new discharges.

14. Documentation and waste shipping paperwork; identification of and obtaining approval from appropriate off-Site disposal facility for disposal/recycling of impacted soils; and loading, transport, and disposal of impacted soils. The Owner must approve all Contractor proposed disposal and or recycling facilities prior to off-site shipment of impacted soils or other materials.

15. Protecting the health of workers, other on-Site personnel, the general public and minimizing impacts to the environment.

16. Preparing and complying with the project Health and Safety Plan (HASP) and all other applicable local, state, and federal health and safety standards.

B. Contractor shall dewater, bulk, blend, solidify, or stabilize saturated soil prior to off-Site transportation and disposal so that the material meets all local, state, and federal transportation requirements and all recycling facility and/or disposal facility requirements. Unless specified otherwise, on-Site processing of these materials is considered incidental to the Work and no separate payment shall be made for these activities.

C. Contractor shall contract directly with facilities for off-site transportation and reuse, salvage, recycling, treatment and/or disposal of all excess materials generated during the Work.

D. GZA's responsibilities include:
   1. Coordinating with the Contractor to facilitate proper segregation of materials.
   2. Reviewing Contractor's documents related to compliance with applicable environmental permits, approvals, and authorizations.

1.4 REGULATORY COMPLIANCE

A. The Contractor shall conduct all work in accordance with applicable federal, State of Connecticut, the Town of Stratford, and codes, ordinances, statutes, regulations, and permits that may apply to the project, including but not limited to:
   1. Regulations of Connecticut State Agencies (RCSA) 22a-133k-1 through k-3 (a.k.a. the Remediation Standard Regulations [RSRs]);
   2. CTDEEP General Permit for Contaminated Soil and/or Sediment Management;
   3. CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities;
   4. CTDEEP General Pretreatment Permit for Significant Industrial User, Dewatering, and Remediation Discharges (including treatment and/or disposal if dewatering of polluted groundwater to a POTW is necessary at the Site);
   5. CTDEEP General Permit for the Discharge of Groundwater Remediation Wastewater (including treatment and/or disposal if dewatering of polluted groundwater to surface water is necessary at the Site). We note that this General Permit expired in March 2025 and has not been renewed yet by CTDEEP. However, CTDEEP has indicated that the permit should be followed for new discharges; and
   6. All other applicable Local, State, and federal statutes and regulations pertaining to environmental impact assessment, air pollution control, safe drinking water, water pollution control, solid and hazardous waste management, and toxic substances control.

1.5 PLANNED EXCAVATION ACTIVITIES

A. The Site work associated with this project will require earthwork activities, including but not limited to the following:
   1. Installation of erosion controls;
   2. Location and documentation of existing underground utilities;
   3. Excavation and stockpiling of certain soils;
   4. Construction of pile foundations.
   5. Construction of cast in place, reinforced concrete flood wall;
   6. Construction of earthen dike flood barriers;
   7. Alterations of surficial coverings including grading and realignment of driveways and parking areas, and landscape islands;
   8. Installation of structures; and
   9. Site grading and drainage.

1.6 SUBMITTALS

A. Contractor shall identify all proposed disposal/recycling facilities to be used.

B. Within 7 days of Notice to Proceed, Contractor shall prepare and submit to Engineer a project-specific Materials Removal, Stockpile, and Disposal Plan. The Plan shall outline, at a minimum, Contractor's methods for, stockpiling, tracking, handling, loading, transporting, and disposing of all excess materials generated during the Work as specified herein. Contractor shall not remove any generated material from the Site, until the Excess Materials Removal and Disposal Plan has been reviewed by the Engineer and Owner.

C. The Materials Removal Stockpile, and Disposal Plan shall include, but not be limited to, the following:
   1. This plan shall specifically address how materials will be managed, staged, transported and disposed off-Site.
   2. A detailed flow chart or schematic describing the means and methods for tracking, handling, loading, and off-Site transportation of all excess materials.
   3. Contractor's methods for tracking, handling, loading, shipping, and disposing of all excess materials.
   4. Name(s) and address(es) of all recycling and treatment/disposal facilities that Contractor proposes to use. This information shall also be provided with Bid.
   5. Name, title, and telephone number of contact person for each disposal facility to be used.
   6. A list matching each facility with the materials it will accept for this project, and specifying whether the facility is a recycling, treatment, storage, or disposal facility.
   7. Estimated quantities of excess materials expected to be transported off-Site to each facility-specific location.
   8. Written confirmation from the various facilities that they will accept the type and quantities of materials, the daily maximum and minimum quantities (cubic yards or tons per day) and the dates and times (including days of the week) they will accept materials from this Work.
   9. A description of Contractor's procedures to manage and track materials and an example of Contractor's material tracking log.
   10. Name, title, and telephone number of contact person for each transporter to be used.
   11. For each transporter to be used, copies of licenses or up-to-date permits to operate and confirmation that they are permitted to transport materials to the respective facility.
   12. Details on the procedures to dewater, thicken, blend, or solidify saturated soil and sediment prior to off-Site transportation and disposal. These details shall include the proposed equipment and information on any additives to thicken or solidify saturated soil and sediment including safety data sheets (SDSs).

D. Contractor shall submit daily disposal truck logs to Engineer and Owner. Logs shall include date, waste type, transporter, disposal facility identification and location, BOL or manifest number, vehicle number, driver, and approximate volume and weight of waste.
   1. Disposal Receipts: Prior to submission of a progress payment for Work including material disposal, and within 5 days of transportation from the Site, Contractor shall document actual disposal of the waste at the designated facility by providing disposal receipts from the facility to the Engineer. Such certificates and receipts shall bear the printed name of the facility operator and shall specify the date of delivery, specify quantity and type of material delivered, weight tickets, and shall be signed by an on-Site representative of the facility operator. Payment may be withheld at the discretion of Engineer for the disposal of materials for which there are no signed disposal receipts. Where applicable, receipts with tare weights from certified scales shall be obtained within 2 hours of dumping the load for disposal.
   2. Contractor shall submit certificates of recycle for all recycled materials generated during course of Work. Certificates of recycle shall include date, recycle facility, identification and location, approximate volume, and/or weight of material, and description of recycle methods
   3. Contractor shall submit all paperwork associated with material transportation and disposal to Engineer and Owner.

1.7 REFERENCES

A. Applicable references for the Work specified herein include, but are not limited to, the following:
    1. Information in the contract plans and in the Specifications relating to subsurface conditions, environmental conditions, existing utilities and structures is from the sources presently available. Such information is furnished only for the information and convenience of the Contractor, and the accuracy and completeness of this information is not guaranteed. Refer to Project Manual for "Geotechnical Engineering and Environmental Data Report, Stratford Water Pollution Control Facility, 105 Beacon Point Road, Stratford, Connecticut", dated February 20, 2023, prepared by GZA GeoEnvironmental, Inc. and "Supplemental Analytical Data Report, Stratford Water Pollution Control Facility (WPCF) Perimeter Flood Wall Improvements, Stratford, Connecticut 06115", dated January 29, 2026, prepared by GZA GeoEnvironmental, Inc. for results of environmental testing performed on samples from the subsurface explorations. This documents are not part of the Contract Documents. The Contractor may, at his own expense and upon application to the Owner, conduct additional subsurface explorations and laboratory testing. The opinions expressed in these reports are those of the Geotechnical and Environmental Engineer (GZA GeoEnvironmental, Inc.) and represent interpretations of the subsurface conditions and testing as a result of widely spaced subsurface explorations. The Owner and Geotechnical and Environmental Engineer will not be responsible for interpretations or conclusions drawn from these data by the Contractor.

B. Connecticut Department of Energy and Environmental Protection (CTDEEP): General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer).

C. CTDEEP: General Permit for Stormwater and Dewatering Wastewaters from Construction Activities.

D. CTDEEP General Pretreatment Permit for Significant Industrial User, Dewatering, and Remediation Discharges (including treatment and/or disposal if dewatering of polluted groundwater to a POTW is necessary at the Site);

E. CTDEEP General Permit for the Discharge of Groundwater Remediation Wastewater (including treatment and/or disposal if dewatering of polluted groundwater to surface water is necessary at the Site). We note that this General Permit expired in March 2025 and has not been renewed yet by CTDEEP. However, CTDEEP has indicated that the permit should be followed for new discharges; and

F. 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

G. Occupational Safety and Health Administration Standards and Regulations contained in Title 29, Code of Federal Regulations (CFR), Parts 1910 and 1926, including amendments as stated in Federal Register, March 6, 1989, Final Rule, 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response".

H. Regulations of Connecticut State Agencies Section 22a-174-18(b)(3)(C) National Fire Protection Association (NFPA) Standards.

I. Federal Resource Conservation and Recovery Act, as amended.

J. United States Environmental Protection Agency (USEPA) 40 CFR 268,

K. Posted weight limitations on roads and bridges.

L. Applicable USEPA Analytical Methods.

M. Code of Federal Regulations – Protection of the Environment, Sub-chapter I – Solid Wastes.

N. 40 CFR 263 Standards Applicable to Transporters of Hazardous Waste.

O. Code of Federal Regulations – Transportation, Sub-chapter B – Hazardous Materials Transportation and Pipeline Safety.

P. 49 CFR 106 Rule-Making Procedures

Q. 49 CFR 107 Hazardous Materials Program Procedures

R. Code of Federal Regulations – Transportation, Sub-Chapter C, Hazardous Materials Regulations.

S. 49 CFR 171 General Information, Regulations, and Definitions

T. 49 CFR 172 Hazardous Materials Tables and Hazardous Materials Communications Regulations

U. 49 CFR 177 Carriage by Public Highway

V. 49 CFR 178 Specifications for Packaging

W. 49 CFR 179 Specifications for Tank Cars

X. 49 CFR 180 Continuing Qualification and Maintenance of Packaging

PART 2 – PRODUCTS

A. Polyethylene plastic sheeting: 10-mil minimum thickness.

B. Straw bales: made of straw with 40 pounds minimum weight and 120 pounds maximum weight.

C. Snow fence: maximum 3-inch mesh size, minimum height 4 feet.

D. Silt fence: polypropylene sheeting minimum height of 2 feet.

E. Long Duration Foam, as manufactured by Rusmar Incorporated, Product No. AC-645, or equivalent, for use to control dust, vapors, and odors.

PART 3 – EXECUTION

3.1 MANAGEMENT OF EXCAVATED MATERIALS

A. The Contractor shall review associated bid documents and specifications to make their own determination on the quantities of material for excavation and stockpiling. If suspect materials are encountered during excavation activities, the Contractor shall immediately notify GZA and the Owner.

B. Soil and erosion control requirements for soils must comply with the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (if required by the Regulators), and, based on the size of the proposed site disturbance area (<5 acres), registration under the permit may be required and a Stormwater Pollution Control Plan (SWPCP) will need to be developed and implemented for the project. The Contractor must adhere to SWPCP and follow the Connecticut Guidelines for Soil Erosion and Sediment Control and the Connecticut Stormwater Quality Manual. Contractor must also adhere to the local soil and erosion control land use regulations, as applicable.

C. Based on the elevation of the groundwater table, it is anticipated that dewatering will be necessary during excavation and construction activities as well as management and monitoring of stormwater.

D. Excavated materials may be managed as follows:

1. Asphalt materials shall be stripped from the excavation areas and the asphalt shall be recycled at a permitted recycling facility, disposed of at a landfill permitted to accept such materials. The Contractor shall provide the Project Engineer and/or Owner the name, address and recycling permit number for the facility that will accept materials from the Project at least 2 days prior to transport of the asphalt from the Site.

2. Polluted Soil (which could include pile installation spoils, fill, or native soils) are soils containing chemical constituents of concern at concentrations detectable by the laboratory and below the most stringent RSR criteria (Residential Direct Exposure Criteria (R-DEC) and GA Pollutant Mobility Criteria (GA-PMC)) and can be disposed of at a landfill permitted to accept such materials or can be reused onsite (if suitable) with the following limitations: 1) They must be used above groundwater and 2) They must be used in areas which are not subject to erosion. The Contractor shall provide the Project Engineer and/or Owner the name, address and recycling permit number for the facility that will accept materials from the Project at least 5 days prior to transport of the material from the Site. The Contractor must provide a Polluted Soil Reuse Plan for review and comment by the Engineer and Owner if the Polluted Soils will be used as fill on site. The plan must provide the intended use and area where the fill will be placed.

3. Contaminated Soil (which could include pile installation spoils, fill, or native soils) are soils containing chemical constituents of concern above the R-DEC and GA-PMC that will be excavated, stockpiled, transported, and disposed of at a landfill permitted to accept such materials, or other permitted disposal facility. The Contractor shall provide the Project

Engineer and/or Owner the name, address and recycling permit number for the facility that will accept materials from the Project at least 5 days prior to transport of the material from the Site.

4. PCB Impacted Soil (which could include pile installation spoils, fill, or native soils) are soils containing PCBs at any levels that will be excavated, stockpiled, transported, and disposed of at a permitted disposal facility. The Contractor shall provide the Project Engineer and/or Owner the name, address and recycling permit number for the facility that will accept materials from the Project at least 5 days prior to transport of the material from the Site.

5. Clean (unrestricted) Soil (which could include pile installation spoils, sediment, fill or native soils) are materials with no detectable concentrations of chemical constituents of concern. These materials may be reused onsite (if geotechnically suitable) or disposed of off-site with no restrictions.

6. Construction Water – includes dewatering flows, water generated from pile installation, and stormwater runoff collected during the Work. Construction Water shall be handled according to the following classifications:

    a. Decontamination Liquids (Non-hazardous) – includes liquid wastes generated from decontamination activities that are classified as non-hazardous based on analytical testing results. All collected water from these processes shall be disposed off-Site. These liquids shall be stored, managed, and disposed of separate from dewatering flows.

    b. Liquids (Hazardous) – includes liquid wastes generated during the Work that contain non-aqueous phase liquid (NAPL) and/or classified as Hazardous based on analytical testing results. All Hazardous Liquid Wastes shall be disposed of off-Site.

    c. Dewatering Flows (Non-hazardous) – includes liquid wastes generated from excavation dewatering activities consistent with the requirements of Section 02300 – Earthwork and 02319 Temporary Water Control. As described in these Specifications, Dewatering Flows shall be placed in a fractionation tank and sediments allowed to settle or pumped through dewatering sediment bags consistent prior to discharge with the requirements of the Owner. The fractionation tank and disposal or infiltration of Dewatering Flows is considered incidental to the Work and no separate payment will be made.

7. Solid Waste – includes non-impacted debris including, general refuse, trash, unstained/untreated wood waste, otherwise non-impacted wood treated with chromated copper arsenate (CCA), generated during the Work.

8. Clearing and Grubbing Waste – includes non-impacted organic matter including wood, wood chips, shrubs, brush, stumps, and root systems generated during clearing and grubbing activities.

9. Treated/Impacted Wood Waste – includes treated, coal tar impacted, or stained/coated wood waste, including piles, excavated and/or dredged and/or pulled/removed during the Work. Includes wood containing chemical preservatives such as, but not limited to, creosote or pentachlorophenol; wood containing paints, stains or other coatings, or adhesives.

10. Scrap Metal – includes non-hazardous and non-impacted steel that has been decontaminated or always was segregated from non-impacted debris, soil, or sediment.

3.2 EXCAVATION ENVIRONMENTAL CONTROLS

A. The Contractor shall employ dust control measures necessary to minimize the creation of airborne fugitive dust from soils during performance of this work. Such measures shall include the containment of soils through implementation of soil transfer and stockpile best management practices and other suitable methods (i.e., wetting and covering stockpile/trucks) to limit dust, as necessary. Certain contaminants if present in Site soils at high concentrations could present a particulate inhalation hazard when contaminated soil becomes airborne with dust if site conditions are dry. An aggressive approach towards dust suppression shall be employed. Work areas shall be wetted with a water mist to control dust generation resulting from vehicle and personnel traffic and from soil handling activities. Should visible dust be generated from site operation, additional wetting shall be implemented.

B. Contractor shall monitor the work area in accordance with the requirements of the Site Health and Safety Plan (HASP) as prepared in accordance with this SMP. Contaminant vapors at significant concentrations that might require respiratory protection for Site workers are not anticipated during the project. However, in the event, that excavation or other Site activities encounter contaminants, vapors or odors, as determined through air monitoring and/or direct observations, GZA shall be notified and the Contractor shall be prepared to employ control measures necessary to minimize the generation of such contaminant vapors and odors. Such measures shall include: restricting work in a particular area; use of temporary mats or coverings; use of odor-suppressant foam; containment of a particular work area; and other feasible means of controlling contaminants, vapors and odors, as necessary, including remediation.

C. As part of this project, certain amounts of suitable soils/sediment may be stockpiled for reuse at the Site. At least one business day prior to the commencement of excavation activities, the work area(s) shall be prepared to receive the stockpiling of impacted materials. The location(s) of the stockpiles shall be in accordance with the conditions of the Soil Erosion and Sediment Control Plan.

D. The following materials may be separated and stockpiled:

1. Asphalt;

2. Polluted Soil. Soils (which could include pile installation spoils, fill or native) will be temporarily stockpiled separately;

3. Contaminated Soil. Contaminated soils (which could include pile installation spoils, fill, or native) will not be reused at the Site;

4. PCB Soil. PCB Soil (which could include pile installation spoils, fill, or native) will not be reused at the Site. However, it must be temporarily stockpiled for characterization and disposal.

5. Clean soils. (fill or native soils). Clean soil types shall be stockpiled separately.

E. No clean soils from the Site will be exported or disposed of as "clean soil without restrictions" unless Contractor clearly and cleanly segregates those clean soils from the Polluted Soil and Contaminated Soil, prior to loading and transport.

F. The following minimum criteria shall apply to stockpiles.

1. Stockpile areas containing materials (Clean Soils, Contaminated Soils, Polluted Soils, and PCB Impacted Soils) shall be graded such that stormwater run-on and runoff is diverted around the stockpiled materials. At a minimum, a snow-fence and haybales with silt fence shall be placed continuously around the perimeter of each stockpile area. The stockpile area shall be underlain with a minimum ten (10)-mil-thick polyethylene sheeting. In the event excavated materials are excessively wet (saturated), earth berms or temporary retaining walls shall be placed around the perimeter of the stockpile area, if necessary, to prevent contact of runoff with contaminated soils and to contain drainage from the stockpiles. Stockpile side slopes shall be no steeper than 3 horizontal (H) to 1 vertical (V).

2. Drainage effluent from the contaminated stockpiles, which is to be contained within perimeter berms, shall be disposed of in such a manner as will not cause injury to public health, water quality of nearby surface water bodies, nor to public or private property, nor to existing work, nor to the work completed or in progress, nor to the surface of roads, walks and streets, nor cause any undue interference with the use of the same by the public.

3. The stockpile area shall be cleared and then fenced off, if Site access is not already restricted, to minimize the contact of workmen and passers-by with stockpiled materials. The area shall be visibly marked with appropriate signs warning of potential hazards.

4. Stockpiled materials shall be placed within the designated stockpile areas, graded to shed water, and covered prior to inclement weather and at the end of each work day with a minimum ten (10)-mil-thick black polyethylene cover overlapped and weighted so as to form a continuous waterproof barrier over the material. The cover shall be maintained throughout the stockpile period to prevent water from entering the stockpiled materials and to prevent blowing dust. Stockpile locations shall be placed as approved by the Owner and Engineerin advance of construction.

5. The transfer of contaminated materials from the excavation to the stockpile area shall be conducted in such a manner as to prevent loss of or spread of contaminated materials or dust across the Site.

6. The Contractor is responsible for all construction, protection, movement, and maintenance of stockpiles for the duration of the project work or until directed otherwise by the Owner or Engineer.

7. The clearing and preparing of stockpile areas and the grading, polyethylene barriers, berms, and all other materials, equipment, and labor required for protection of the excavated material will be considered part of the work.

3.3 SAMPLING AND DECONTAMINATION PROCEDURES

A. Prior to the excavation of onsite impacted materials (PCB Impacted Soils, Contaminated Soils and Polluted Soils), limited pre-characterization sampling was performed, and no additional sampling is planned. During the course of excavating soils, additional sampling by the Contractor may be necessary if potentially Polluted or Contaminated Soil are observed.

B. Additional soil/sediment sampling will be conducted as detailed below, at a frequency as indicated by the Engineer or the disposal facility.

3.4 SOIL SAMPLING PROCEDURES

A. Proper soil sampling technique requires, on the part of the field representatives, understanding of the objective of the sampling program and adhering to the following guidelines. The following equipment will be required:

1. Stainless steel auger(s), trowel(s), and/or shovel(s)

2. Stainless steel bowl(s) and spoon(s)

3. Reagent grade methanol and wash bottle

4. Sample containers of appropriate size and preservative (if required) for each constituent to be analyzed according to EPA protocols

5. Buckets, water, Alconox or equivalent

6. Paper towels and garbage bags

7. Coolers and ice packs

8. Sample labels and waterproof markers

9. Chain of custody forms and custody seals

B. The sample will be collected using an auger, trowel or shovel, placed in the appropriate container, and labeled according to the procedures outlined below. The soil sampling equipment will be decontaminated between each sample location. The soil samples will be obtained in the following manner:

1. Samples for volatile organic compounds will be discrete grab samples (one per 500-cubic yards or as required by the disposal facility).

2. For other constituents, composite samples will be prepared by combining equivalent volumes of soil from individual grab samples. Between 5 and 10 grab samples will be retrieved from each 500-cy stockpile and used to make a composite sample.

3. Grab samples will be collected at different depths and locations in the stockpile utilizing a stainless-steel hand auger or stainless-steel trowel to ensure variations in the soil types are proportionally represented in the composite. Successive grab samples will be placed in the same stainless-steel bowl.

4. After the 5 to 10 grab samples have been placed into the bowl, the contents of the bowl will be fully mixed with a decontaminated spoon and a representative sample of the contents will be transferred into the appropriate sample containers.

5. Samples will be labeled according to the procedures outlined below.

6. Spoils derived from the stockpile sampling program will be placed back into the stockpile.

C. Decontamination of soil sampling equipment is the responsibility of the field personnel. Decontamination of the sampling equipment will be performed as follows:

1. Scrub the surface of the sampling equipment with a brush that is consistently submerged in a bucket containing Alconox mixed with tap water.

2. Rinse the scrubbed sampling equipment with tap water contained in adjacent bucket.

3. Rinse the sampling equipment with methanol over a third bucket to capture the methanol.

4. Rinse again with distilled water over a collection bucket.

5. Contain all decontamination liquids for management in a drum or similar container located at the stockpile area.

6. Prevent the cleaned sampling equipment from coming into contact with any potentially contaminated media prior to use for sampling.

D. Proper storage following sample collection is important in maintaining sample quality. Soil samples will be placed promptly into a chilled/iced cooler and maintained at approximately 4 degrees Celsius (C) until delivery to the laboratory. The sample collector will transport the samples directly to the laboratory at the end of the sampling day or will arrange to have the laboratory courier pick up the samples within 24 hours.

3.5 DOCUMENTATION OF FIELD WORK

A. Complete and thorough logging of field work is essential to a timely and accurate completion of the project. Field personnel are responsible for recording actions and times of major events and of sampling in a field log book and/or field sampling log. Also, sample identification (numbers and

descriptions) of field samples will be accounted for on the field sampling log. For each sampling event, the field book and/or field sampling log will contain the following:

1. Field person's name(s), equipment used, weather, date, time, and location at start of day.

2. Descriptions of the sample/stockpile location, stockpile dimensions/estimated volume, origins of materials that comprise the stockpile.

3. Descriptions of the number of grab samples retrieved from stockpile, locations/depths of these grab samples, observed soil types, conditions (staining, odors, fill, debris, etc.) and PID readings at each grab sample location, and identification of the grab sample location selected for the discrete VOC sample.

4. Other comments would include: Description of any unusual conditions; Record of Health and Safety monitoring - time, equipment, and results; Record of site accidents or incidents; Record of any visitors; Causes and duration of any delays; and any other data that may be construed as relevant information at a later date.

B. The Contractor or their environmental consultant will be responsible for filling out chain-of-custody forms when samples are collected. The chain-of-custody form is a document that tracks the samples collected from the field to the laboratory and indicates the custodian of the samples at any time and also which laboratory analyses are to be performed on which samples. Each sample will be clearly labeled and listed on the chain-of-custody. The chain of custody will be filled out as samples are collected and will accompany the samples to the laboratory. The sampler will be the first custodian of the samples and will sign the chain-of-custody when he/she relinquishes custody of the samples to another individual or to the laboratory which will also sign and date the document.

C. Soil samples will be analyzed for certain waste characterization parameters for disposal purposes as required by the designated disposal/reuse facility. These parameters may include ETPH, VOCs, semi-VOCs, total and leachable RCRA 8 metals, PCBs and pesticides. Laboratory turnaround will typically be on a 5-day basis, adjustable to the schedule of construction.

3.6 QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

A. The following section provides descriptions of the QA/QC program which will be followed during the sampling and analysis. This program will be followed to generate analytical data of known and defensible quality. Functioning of the sample collection and analysis process is facilitated by communication between the field sampler and the laboratory and clear identification of the tasks and responsibilities of each. Adherence to the protocol presented herein will minimize problems in maintaining data quality and integrity.

B. Field representatives will conduct the following activities prior to initiating the collection of samples:

1. Select the analytical tests to be performed and schedule the analyses with the laboratory.

2. Determine the type, size, and quantity of sample containers required, the amount of required preservative, and the maximum field holding times for each sample.

3. Determine the equipment required for sampling, and make sure that it is available.

4. Obtain sample containers, preservatives, and trip blanks (if necessary) from the laboratory.

5. Obtain chain-of-custody forms, sampling log, shipping forms, and sealing tapes.

6. Determine that all sampling equipment and accessories have been decontaminated as described in this SMP.

3.7 STOCKPILED MATERIAL CLASSIFICATION, HANDLING, AND DISPOSAL

A. The Contractor is required to complete any required waste characterization sampling and testing, identify appropriate off-Site disposal facilities for impacted soils, and arrange for loading, transport, and disposal of impacted soils. Owner will sign all transportation and disposal documents (Material Shipping Records [MSRs] or Bills of Lading [BOLs]) as the Generator.

3.8 MANAGEMENT OF GROUNDWATER

A. Based on depth to groundwater at the Site, the Contractor will encounter groundwater during the proposed excavations at the Site. The Contractor shall properly contain groundwater discharge and manage all dewatering in accordance with local, State, and federal regulations. Dewatering activities must comply with the CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, which applies to all discharges of stormwater and dewatering wastewater from construction activities which result in the disturbance of one or more total acres of land area on a site regardless of project phasing. Note that registration is required under this general permit for projects disturbing greater than 5 acres of land (such as the Site) and the permittee must develop and implement a Stormwater Pollution Control Plan for the project, and adhere to the Connecticut Guidelines for Soil Erosion and Sediment Control, the Connecticut Stormwater Quality Manual, and local soil and erosion control land use regulations

B. Should groundwater quality show impacts, it may need to be containerized and removed for off-site disposal or discharged in accordance with CTDEEP General Pretreatment Permit for Significant Industrial User, Dewatering, and Remediation Discharges (including treatment and/or disposal if dewatering of polluted groundwater to a POTW is necessary at the Site); and or CTDEEP General Permit for the Discharge of Groundwater Remediation Wastewater (including treatment and/or disposal if dewatering of polluted groundwater to surface water is necessary at the Site). We note that this General Permit expired in March 2025 and has not been renewed yet by CTDEEP. However, CTDEEP has indicated that the permit should be followed for new discharges; and

C. The Contractor shall consult with GZA and the Owner prior to the start of any dewatering activities. Dewatering shall be performed in accordance with the requirements of Section 02319 Temporary Water Control and this specification.

D. Minimum precautions noted in this Section shall in no way relieve the Contractor of its responsibility for implementing stricter health and safety precautions as warranted by the Work.

E. The Contractor shall be responsible for adhering to regulations, specifications, and recognized standard practices related to both contaminated and uncontaminated soil and groundwater/stormwater handling during excavation and dewatering for construction.

F. The Contractor shall be responsible to remove and transmit groundwater and stormwater with the requirements of Section 02319 Temporary Water Control. Contractor shall complete dewatering activities in accordance with all applicable local, State, and federal regulations and permits.

G. The Contractor shall make reasonable effort to minimize the volumes of groundwater dewatered from the excavation.

3.9 DECONTAMINATION OF EQUIPMENT AND HEALTH AND SAFETY

A. The Contractor is responsible to clean all tools and equipment before they are taken from the Site. Contractor's tools and equipment which are to be taken from the Site shall be decontaminated on-Site. This shall include all tools, heavy machinery and excavating and hauling equipment used during excavation, stockpiling and any re-handling of impacted soil or groundwater.

B. The Contractor and any subcontractors performing work within the contract limits shall have a Site-specific written Health and Safety Plan (HASP) developed by a qualified person designated by the Contractor. The Contractor shall establish protocols and provide procedures to protect worker's health and safety as it relates to the proposed construction activities when performed in the presence of contaminated materials or otherwise environmentally sensitive conditions. The HASP shall be developed and implemented to address the relative risk of exposure to documented hazards present within the contract limits. The HASP shall establish health and safety protocols which address the relative risk of exposure to regulated substances in accordance with 29 CFR 1910.120 and 29 CFR 1926.65. Such protocols shall only address those concerns directly related to Site conditions.

C. The Contractor shall utilize available information and existing records and data pertaining to chemical and physical hazards associated with any of the regulated substances to develop the HASP. Further information can be made available to the Contractor upon request.

D. The requirements set forth herein pertain to the provision of workers' health and safety as it relates to proposed project activities when performed in the presence of hazardous or regulated materials or otherwise environmentally sensitive conditions. The provision of worker health and safety protocols which address potential and/or actual risk of exposure to Site specific hazards posed to Contractor employees is solely the responsibility of the Contractor.

PART 4 - MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment shall be made at the contract unit price per ton based on weight ticket provided by the disposal facility.

B. There shall be no separate measurement or payment for quantities of clean soil or asphalt removed from the Site by the Contractor, which will be considered incidental to the Work of this Section.

C. Unit price shall include as costs associated with oversight, labor, testing, excavation (either by equipment or by hand), erosion management, stockpiling, loading, transportation, offloading, disposal and disposal fees, permits and any third-party management costs, if required.

4.2 PAYMENT ITEMS

A. Payment shall be made at the contract unit price per ton based on weight ticket provided by the disposal facility. This price shall include full compensation for all for all oversight, labor, testing, excavation (either by equipment or by hand), erosion management, stockpiling, loading, transportation, offloading, disposal and disposal fees, permits and any third-party management costs, if required; as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work of this Section which is not included in other items.

ITEM NO.	PAYMENT ITEM	UNIT
02315.1	PCB IMPACTED SOIL	TON
02315.2	CONTAMINATED SOIL	TON
02315.3	POLLUTED SOIL	TON

END OF SECTION 02315

SECTION 02319

TEMPORARY WATER CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and GENERAL REQUIREMENTS (if any), apply to this Section.

B. Related Work Specified Elsewhere:
   1. Section 02315 – Soils Management Plan
   2. Section 02300 – Earthwork
   3. Section 02350 – Excavation Support and Protection
   4. Section 01560 – Temporary Erosion and Sedimentation Controls

1.2 SUMMARY

A. The Work of this Section includes the furnishing of all labor, equipment, supplies, materials and utilities required for the operation, maintenance, and supervision of efforts to control water (stormwater utility flow, groundwater, flood water, and surface water) at the Site such that all construction within this Contract can proceed unhindered by water and flow into or through the work area or into the Stratford Water Pollution Control Facility (WPCF).

B. This section specifies the removal and control of water to the work area in order to permit all excavation, construction, installations, and repairs to be performed in the dry and to maintain the current level of flood protection at the WPCF. Water control shall be provided such that the Work of the Contract can proceed unhindered by water and flow into or through the work area. The Site is in an AE14 Flood Zone with a 1% annual chance flood of El. 14 feet. Water control shall also extend to all provisions necessary to control water from the Housatonic River/Long Island Sound, and surface drainage from flowing into, disrupting, and damaging the work area and the WPCF. All work shall be performed in accordance with the plans and specifications and to the satisfaction of the Owner. Water control is of the utmost importance.

C. The Contractor shall be responsible for determining the need for and the means and methods of implementing water control during the work of the Contract, except as specifically stated herein and in other Sections. The Engineer will observe conditions at the site and the effect of water levels and flows on the Work. If, in the Engineer's opinion, the presence of water has the potential to create a detrimental effect on the Work or the WPCF, then the Contractor shall take immediate measures to control such water to the satisfaction of the Owner at no additional cost to the Owner.

D. The control of surface water shall consist of installing such provisions, as needed, to divert, reduce, or stop water which may be flowing into, on, or through the work site. The need for

control of surface water may change over the course of the project depending on the work underway, as well as rainfall/runoff conditions encountered, which may change the level of the water. Pumping, siphoning, and/or other methods may be required for certain activities.

E. The Contractor shall take all necessary precautions during construction to provide and maintain proper equipment and facilities to remove promptly and dispose of properly, all water entering work areas and keep work areas dry, as necessary. The Contractor shall implement such temporary water control measures as necessary to maintain the water level such that all work, where judged necessary, proceeds in the dry. Temporary water control work may include, but shall not be limited to diversion pipes, channels, swales, berms, pumps, siphons, culverts, temporary cofferdams, etc.

F. Water control measures shall be in operation as needed until all work within those areas of the work zone subject to interference by surface water is complete and accepted by the Owner.

G. The Contractor shall remove all channeled, pumped, diverted, or siphoned surface water away from the work area, and provide sedimentation control and recharge in accordance with all applicable local codes and laws. All water which is discharged by water control measures shall be passed through appropriate and adequate sediment and/or filtration measures such that the effluent meets local, State and Federal regulations, and all requirements of the Project Permits. Water diverted or pumped by the Contractor shall be discharged to the location determined by the WPCF and shall maintain water quality standards. Adequate provision for erosion control at the discharge point shall be provided as part of the Work of this Section.

H. All temporary water control work shall be coordinated with temporary sedimentation and erosion control work as specified in the Contract.

I. The Contractor shall prepare and implement a Flood Emergency/Response Plan subject to review and comment by the Engineer and Owner describing the measures to be implemented in the case of potential flooding of the work areas and the WPCF.

J. Shallow sumps may be required to maintain the lowered groundwater level until work has been completed. Sumps shall be surrounded by suitable filter material. Well points may be required in place of or in addition to other dewatering techniques. Pumping shall be continuous as necessary to maintain the work in the dry.

K. The Contractor shall ultimately discharge all dewatering and groundwater control effluent to the location determined by the WPCF, provided that the Contractor meets the discharge water quality standards with respect to turbidity, dissolved oxygen, pH, and other characteristics, as stated in any permit or relevant regulation. The Contractor shall be required to monitor discharge water quality and the Owner may also independently monitor water quality.

1.3 PROJECT CONDITIONS

A. As part of the Contractor's Water Control Plan, the Contractor must monitor the weather and is responsible for securing their equipment, tools and materials for all storm events. During

such an event, the Contractor shall be required to act rapidly, including removal of personnel and equipment from potentially affected areas. The Contractor may have to demobilize from the potentially affected areas on a temporary basis at no additional cost to the Owner. Prior to leaving the area, the Contractor shall take such steps as are necessary to protect completed Work and Work in progress and remove all equipment and materials from areas with the potential for inundation. After water levels/flows have receded, the Contractor shall remobilize at no additional cost to the Owner. Remobilization shall include all effort required to restart the Work.

1. To reduce the chance of high-water levels/flows affecting the Work, the Contractor is urged to pay particular attention to weather forecasts for the area and to schedule work in vulnerable areas for periods which are anticipated to be relatively dry. The Contractor shall sequence their work in such a manner as to reduce the potential for inundation of work areas.

B. The Contractor is hereby informed that seepage may result from gradients both upstream (Flood Side) and downstream (Protected Side) of the Work area or above the subgrade elevations of excavations during various portions of the Work.

1. Contractor shall have on-site durable materials in sufficient quantities to fill excavations and resist erosion during any breaching and/or excavation along the flood and water control. The Water Control Plan shall state the types of materials that will be onsite and the quantities.

C. The Contractor is hereby informed of the presence of granular sands without significant cohesion. The Contractor shall expect that special provisions will be necessary to prevent boiling and heaving of these soils which might result from excessive seepage exit gradients during the execution of the Work, particularly during excavations.

1.4 ADHERENCE TO REGULATORY CONDITIONS

A. All work shall comply with all codes, rules, regulations, laws and ordinances and executed in conformance with any permits, licenses etc., as issued by the Municipality, State, Federal, and all other authorities having jurisdiction within the project areas. All work necessary to make the work site comply with such requirements shall be provided without additional cost to the Owner.

B. The Contractor’s Stormwater Pollution Control Plan (SWPCC) must encompass the implementation of sediment, erosion, and water control performance specifications. All temporary dewatering and water control measures must be installed and maintained in accordance with the approved SWPCC. It shall be the Contractor’s responsibility to maintain a copy of the SWPCC on the site at all times and abide by its requirements.

C. Copies of all available permits and licenses are included in the Contract Documents or will be forwarded to the Contractor prior to the beginning of the work. The Contractor shall be responsible for conducting their work in accordance with all provisions of said permits.

D. The Contractor shall procure all other required permits and licenses, (except for those to be obtained by the Owner as stated herein), pay all charges, fees and taxes and shall give all notices necessary and incidental to the due and lawful prosecution of the work under this Contract. The cost thereof shall be included in the Contract bid prices for the various items specified herein for the work of this Contract. Copies of all required permits and licenses shall be filed with the Owner prior to the start of work.

E. The Contractor shall be responsible for complying with all orders and permit conditions of regulatory agencies for the installation, maintenance, and removal of all erosion and sedimentation control measures.

F. No work of any type in any area shall commence until sedimentation control measures are in place to the satisfaction of the Owner and Engineer.

G. All temporary dewatering and water control measures must be installed and maintained in accordance with the reviewed sediment and erosion control plan and applicable submittals.

H. The Contractor shall handle such water in a manner consistent with applicable general permit requirements including:
   1. CTDEEP General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities (Effective Date December 31, 2020) (if required by the Regulators)
   2. CTDEEP General Pretreatment Permit for Significant Industrial User, Dewatering, and Remediation Discharges (including treatment and/or disposal if dewatering of polluted groundwater to a POTW is necessary at the Site).
   3. CTDEEP General Permit for the Discharge of Groundwater Remediation Wastewater (including treatment and/or disposal if dewatering of polluted groundwater to surface water is necessary at the Site). We note that this General Permit expired in March 2025 and has not been renewed yet by CTDEEP. However, CTDEEP has indicated that the permit should be followed for new discharges.

1.5 SUBMITTALS

A. Not less than ten (10) days prior to the scheduled start of work, the Contractor shall submit their Water Control Plan with proposed method of controlling water and maintaining dry conditions, to the Owner for review and comment. The submittal shall include as a minimum the following items:
   1. The Contractor's proposed design, sequence of operation, maintenance and supervision of the water and control systems, as needed for each phase of the work. The submittal shall include a list of all equipment to be provided along with performance characteristics and installation methodologies. In addition, a rationale and calculations (if applicable) for the number and size of pumps, if pumps are required, shall be included in the design submittal.
   2. Weather monitoring protocol.
   3. The location and mobilization time of two (2) pumps capable of pumping a minimum of 5,000 gallons per minute each, as specified in Section 2.2.

4. Material type and quantity that will be on-site in case of erosion or breaching of the flood control during excavations along the dike or the proposed flood improvements.
5. Design of temporary cofferdams and shoring (if required) shall be submitted to the Engineer and Owner for review and comment.
6. The Contractor's proposed means of controlling excessive exit gradients in excavations, including means and methods for reducing gradients and/or filtering soils to prevent the loss of foundation or embankment material. If judged necessary by the Owner, the Contractor shall provide a calculation package stamped by a Professional Engineer licensed in the State of Connecticut, which demonstrates that the bottom of excavations will remain stable against boiling and heave and that expected seepage rates can be controlled by the proposed dewatering system.
7. Scheduling requirements with regard to Sedimentation Control, groundwater control, and temporary cofferdam installation.
8. The Contractor's proposed contingency plan (Flood Emergency/Response Plan) for potential storm emergency conditions (i.e. anticipated heavy rainfall or flood conditions). The contingency plan should address, but not to be limited to, measures for handling flooding of the work area, removing equipment and materials from the work area, and stabilizing exposed portions of the existing dike which might be subject to erosion from surface water flow from flood waters.
9. The Contractor's proposed dewatering water treatment system. The submittal shall include information on all equipment and features to be used in the treatment system, including but not limited to, frac tank(s), filtration bags, intake filtration systems, etc. The submittal shall provide a graphical layout of the proposed location of each feature of the system including intakes, tanks, and discharge points. The submittal shall provide a schematic depiction of the treatment system and the anticipated individual efficiencies of each feature and total efficiency of the system.
10. The Contractor's proposed frac tank cleaning or filter bag changing procedure, including methods for maintaining dewatering operations while cleaning the frac tank or replacing the filtration bags at a frequency required by the Specifications and permit requirements.

1.6 WATER CONTROL RESTRICTIONS

A. The Contractor shall abide by the conditions of all relevant permits issued to the Project which pertain to Water Control. The Contractor alone shall be responsible for meeting the conditions of the permits and shall be held accountable for penalties as a result of violations of permit conditions.

1.7 DISCHARGE OF WATER:

A. Water discharged from any dewatering system in which water is collected and pumped shall be treated in such a manner as to meet the water quality performance standards described in any water quality standards contained in laws, regulations, and permits. In the event of conflict, the most stringent standard shall apply.

1.8 PROTECTION OF WORK FROM FLOOD CONDITIONS

A. The Contractor shall take all such precautions necessary to protect the site and the Work of this Contract, either completed or incomplete, from flood waters and flows which would either damage the Work or the site or cause a delay to the Work. The Engineer and Owner may make recommendations to protect the Work based on the Work sequence and weather conditions. Damage due to failure of the Contractor to install measures or to take actions recommended by the Owner shall be the responsibility of the Contractor. Damage shall be repaired at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DIVERSION BARRIER / COFFERDAM MATERIALS

A. All diversions barriers and cofferdams shall be provided by the Contractor, at their discretion, under the Work of this Section.

B. All materials used in the construction of cofferdams or diversion barriers, shall be clean and free of substances or materials which might lead to contamination of the Housatonic River, wetland resource areas, or other water courses.

C. All sandbags shall be free of rips or tears which would lead to a loss of sand into the site or wetland resource areas, and bag openings shall be tied to prevent the same. Broken sandbags shall be removed and replaced.

D. Loose soil material will NOT be an acceptable material for the construction of cofferdams, berms, or diversion barriers.

2.2 PUMPS, HOSES, SIPHONS

A. The bid item for Temporary Water Control shall include procuring a minimum of two (2) pumps capable of pumping at least 5,000 gallons per minute (GPM) each. The pumps are not required to be onsite but must be able to be mobilized and used within 1 hour. At a minimum, the location and mobilization time of the pumps shall be included in the Contractor's Water Control Plan.

B. Pumps, hoses, or siphons used at the site shall be sized appropriately and shall be maintained in good working order by the Contractor.

C. Pumps shall be sized appropriately by the Contractor and shall operate in a manner which does not create a nuisance to abutters (i.e. quietly and without significant exhaust).

D. Secondary containment shall be provided in accordance with Town of Stratford standards for gasoline or diesel-powered pumping equipment. All appropriate precautions shall be taken to protect the WPCF, adjacent properties, and resource areas.

2.3 PIPE

A. Pipes and fittings used for water control and/or diversions shall be sized appropriately and shall be in good condition without leaks or cracks. Pipe pressure ratings shall be adequate for static head loading when pressure flow is expected. Pipe joints shall be watertight and installed as per the manufacturer's recommendations.

2.4 WELL POINTS

A. Well points shall include appropriate screens to prevent the removal of fine soil material from the subgrade.

2.5 GEOTEXTILES

A. Geotextiles used as part of the construction dewatering system shall provide for appropriate filtration capacity with respect to the site soils.

2.6 INTAKE SUMPS

A. Intake sumps shall be filtered by crushed stone. Geotextile fabric may also be used.

2.7 DEWATERING BAGS

A. Dewatering bags shall be made from permeable non-woven geotextile fabric. Bags shall be sized appropriately, the apparent opening size of the geotextile shall be suitable for the sediment grain size distribution, the bags shall be placed on a gravel bedding, and surrounded by a sediment barrier.

2.8 SOIL MATERIAL

A. Soil and stone used as part of the construction dewatering system shall provide for appropriate filtration capacity with respect to the site soils. All such material shall be clean and free from contamination and shall meet the requirements of the imported materials in Specification 02300 - Earthwork.

2.9 SEDIMENT SETTLING TANKS

A. Sediment settling, or frac, tanks shall be purpose-made, water-tight steel tanks with sufficient stiffness to accommodate full tank levels and specifically configured for providing sediment removal action. Tanks shall have internal baffles to promote settling. Booms shall be provided as needed. Tanks shall be provided with multiple-level fill and discharge ports such that inlet and discharge lines can be configured appropriately. Tanks shall have low-point cleanouts ports and preferably sloped bottoms. Tanks shall be closed top, vented, and shall provide for safe but controlled access to the interior.

2.10 ENHANCED SEDIMENTATION TREATMENT

A. Chemical flocculants such as alum (potassium aluminum sulfate) may be used only with written approval by the Owner and as permitting allows.

2.11 PORTABLE TURBIDITY METER

A. The Contractor shall have onsite at all times a portable turbidity meter which is a full, operations-ready kit, with a case, cuvettes, batteries, charger, manual, and all necessary calibration and cleaning solutions.

B. The portable turbidity meter shall be specifically designed for use in “field” conditions rather than a laboratory.

C. The portable turbidity meter shall provide readings in NTUs and have a reading range of up to 1,000 NTUs. It shall meet or exceed performance criteria specified by USEPA method 180.1 for NTU measurement and shall be accurate to ±2% or reading or ±0.01 NTU.

D. The Contractor shall be responsible for maintaining the meter and all supplies for the meter during the Work of the Project. The Contractor shall immediately replace the meter if it becomes non-functional. The meter and all accessories shall be the property of the Owner at the completion of the project.

PART 3 - EXECUTION

3.1 GENERAL WATER CONTROLS

A. This section defines the intent of water control work, but the Contractor shall ultimately be responsible for means and methods and compliance with the specification will be judged on performance criteria. The Contractor shall submit a Water Control Plan to the Owner for review and may, at that time, propose alternative water control strategies. The Contractor’s water control plan must, however, satisfy the terms and conditions of all permits issued to the project.

B. If pumps or similar equipment are utilized, the Contractor shall maintain immediate access to back-up electrical generators, fuel, pumps, and related equipment and supplies with output capacity sufficient to maintain continuous operation of the water control systems in the event the original water control equipment or power source(s) which is in use becomes inoperable. The back-up generator, pumps and necessary equipment and supplies shall be capable of rapid deployment for replacement for the inoperable equipment. All electrical equipment shall be properly grounded and shall be provided with GFIs and meet all codes and requirements.

C. The Contractor shall take all reasonable and prudent precautions during construction to provide and maintain proper equipment and facilities to control and divert water.

D. If necessary, water control systems shall be operated continuously during all construction specified herein. The operation time may include breaks, nights, weekends, holidays and other times when work is not otherwise being performed on the site. Appropriate alarm systems (autodialer, etc.) shall be provided to provide alert and notification in the event of water control system failure.

E. Water control at the site shall account for the range of flow expected during the course of the Project. Pumps, siphons, pipes, channels, etc. shall be sized appropriately. Any cofferdam / diversion barriers shall be constructed of such materials and to such extent that they will withstand the forces and pressures exerted by flows and depths of a reasonable expected magnitude and to provide at least the current minimum flood protection at the WPCF. The cofferdams / diversion barriers shall be compatible with other dewatering, water control, and sedimentation control procedures. Dewatering equipment shall be provided as needed to remove water from the interior areas of cofferdams / diversion barriers.

F. All cofferdams / diversion barriers constructed by the Contractor shall be completely removed upon the completion of the Project. All material shall be legally disposed of off-site at the Contractor's expense. No material shall be left within the Work area.

G. The Contractor shall make provisions to remove any impediments or obstructions (e.g. debris, material, equipment, etc.) to flow through water conveyance structures expeditiously during the entire project period and in the event of a flood event which threatens to overwhelm the water control system or cause increased water levels which might lead to damage at the WPCF, or other property upstream or downstream of the WPCF.

H. If deployed by the Contractor, pumps must be operated in such a way as to not disturb abutters (e.g. noise). Pump intakes shall be placed to reduce the potential for sediment entrainment and pump discharge points shall make provisions for reducing erosion potential through energy dissipation, riprap protection, etc.

I. In some instances, the Contractor may choose to work in the wet, without attempting to exclude water from the work area. The Contractor may proceed in this fashion so long as the intent of the Work underway is not violated, the quality of the finished product is not reduced, and all applicable permit conditions are satisfied. The Engineer will monitor conditions at the site and the effects of water levels and flows on the Work. If it is judged that the Contractor cannot appropriately complete the Work under the conditions present, the Owner or Engineer will notify the Contractor and the Contractor shall make provision for water control.

J. Prior to dewatering, all sedimentation controls and dewatering treatment systems shall be in-place and operable. Prior to and during excavation, groundwater levels shall be lowered and maintained by the dewatering system submitted by the Contractor and reviewed by the Engineer. Groundwater shall be maintained a minimum of one foot below the subgrade elevation in all work areas. Compliance of the dewatered levels with level specified herein shall be determined by visual observation of sumps, subgrades, etc.

K. Where the Contractor proposes to remove groundwater from the bottom of the excavation by sumps and pumps, the sump shall be surrounded by a suitable filter to prevent removal of soil fines. Pumping from sumps which remove fines from the soil shall be immediately terminated and the dewatering method revised accordingly. If cloudy discharge water (i.e. flow containing fines) is observed, then pumping shall cease immediately. The pump discharge point shall be clearly visible to facilitate observation and inspection.

L. Wellpoints, if used, shall be placed in the appropriate frequency and location so as to provide a uniform drawdown of groundwater across the full area of construction.

M. Geotextiles and filter soils which are used to control boiling or piping must be sized appropriately and placed to the extent and depths as are necessary to control transport of soil and prevent loss of subgrade material.

N. All pumped water shall be discharged only after passing through the approved treatment system and shall meet water quality specifications set in local, State and Federal Regulations and the conditions of the project permits. In the event that discharge water is found to not meet water quality standards, discharge must immediately cease and may not resume until the problem is corrected and discharge water may be verified to meet standards.

O. The Contractor may stage their dewatering plan such that dewatering and groundwater control is limited to areas where work is or soon will be occurring. At the request of the Contractor, groundwater control may cease only when the Owner and Engineer are satisfied that groundwater will no longer affect the Work of the Contract or the integrity of the structure in the area.

3.2 GENERAL WATER CONTROL METHODOLOGY LIMITATIONS

A. In order to maintain the quality of dewatering and water control effluent and to prevent the discharge of unacceptable quantities of sediment, the following minimum restrictions shall be observed. Additional measures may be required by the Contractor to meet effluent standards. All measures by the Contractor to meet the effluent standards shall be considered incidental to the work and no additional payment shall be made.

B. When sumps are required, the intake must be placed within a perforated pipe and the annular space between the pipe and the sump pit (as well as the bottom of the pit) must be filled with Crushed Stone as specified in Section 02300 - Earthwork or as submitted by the Contractor. Filter fabric may also be used if necessary. Note that any crushed stone installed for the purpose of dewatering may not be left in place following dewatering activities unless specifically approved by the Engineer.

C. Discharge water may be passed through “Silt Socks,” “Dirt Bags,” or other proprietary devices which mitigate turbidity delivered to receiving waters. These devices should have a supplemental perimeter line of turbidity curtains and/or linear sedimentation barriers.

D. The use of chemical flocculants may be necessary to achieve water quality standards. The Contractor shall be prepared to use such additives at no additional cost to the Owner but shall

only do so with the written approval of the Owner and after submitting a written plan for approval.

E. The Contractor shall monitor for all water quality parameters for which specific performance standards have been provided herein. The Contractor shall be prepared to provide numerical testing results to the Owner upon request and shall immediately test discharge water for all specified parameters at the request of the Owner. The Owner may require additional treatment or discontinuation of dewatering in the event that test results show non-compliance or test results are not available.

PART 4 - MEASUREMENT AND PAYMENT

4.1 GENERAL

A. There shall be no separate measurement and payment for the other work of this Section. Compensation for such work shall be included in the payment items for which the incidental work is required or Section 01900 Mobilization/Demobilization.

END OF SECTION 02319

SECTION 02350

EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. General provisions of Contract, including GENERAL and SUPPLEMENTARY CONDITIONS, GENERAL REQUIREMENTS (if any), apply to work specified in this Section.

B. State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, latest edition.

1.2 SUMMARY

A. The Contractor shall be responsible for the design and construction of the temporary excavation support system, in accordance with the minimum design requirements specified herein and as required to complete the work shown on the Contract Drawings.

B. Related Sections:
   1. Section 02300 “Earthwork”.

1.3 DEFINITIONS AND REFERENCE STANDARDS

A. Earth Support Systems (ESS): Earth support systems specified herein are systems required for temporary lateral earth support to protect the adjacent structures, roadways, and utilities. Elements for ESS could include soldier piles and lagging, soil nail wall, trench boxes, slide rail system, secant pile walls, tiebacks, wales, struts, rakers, or other options.

B. Owner: Town of Stratford

C. Geotechnical Engineer: Consultant hired by the Owner for review of submittals required herein, and observation/documentation of installation, as applicable.

D. ASTM: Specifications of the American Society for Testing and Materials.

E. AWS: Standard Code for Welding in Building Construction, of the American Welding Society.

F. AISC: Specification of the American Institute of Steel Construction.

G. ACI: American Concrete Institute

H. API: American Petroleum Institute

I. PTI: Post-Tensioning Institute

1.4 PERFORMANCE REQUIREMENTS

A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads. The appropriate excavation support system shall be designed and constructed by the Contractor, and review and comment of the design shall be provided by the Owner and Geotechnical Engineer prior to construction.
   1. Delegated Design: Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer, registered in the State of Connecticut using performance requirements and design criteria indicated.
   2. Prevent surface water from entering excavations by grading, berms, or other means.
   3. Install excavation support and protection systems without damaging existing utilities, buildings, structures, and site improvements adjacent to excavation.
   4. Monitor vibrations, settlements, and movements.

B. The Contractor's ESS system shall satisfactorily control movements of the adjacent existing buildings, roadways, utilities, and other structures, to prevent damage. The vertical and lateral movement shall be less than 0.75 inches, or 0.3% of the wall height, whichever is greater, at any location or depth along the ESS.

C. The Contractor shall design, develop, install, and implement a Monitoring Program, which includes allowable settlements and movement, for review and comment by the Owner and Geotechnical Engineer. Excavation support systems that are adjacent to existing construction are to be designed and constructed in a manner that limits the vertical settlement of the soil adjacent to said construction and limits the lateral movement of the soil adjacent to said construction to the degree indicated in the Monitoring Program and as acceptable by the Owner.

D. Excavation support systems shall be designed and installed in a manner that limits the peak particle velocity of the ground surface throughout the installation period to 1-inch per second with frequency over 40 cycles per second and 0.3-inch per second with a frequency of 4 to 15 cycles per second (with limits between these values linearly interpolated), to the USBM recommended guidelines or to the vibration limits provided by the Owner, whichever is more stringent. The peak particle velocity limits are to be measured at a distance of 25 ft. from the face of the nearest existing structure adjacent to the excavation area.

E. The criteria presented herein are intended only to establish a guideline, and in no way relieves the Contractor of their responsibility for preventing detrimental movements or damage causing structural distress of any structure or utility. The Contractor shall provide all measures necessary to control movements to within the established performance criteria, or to lesser amounts, as required to prevent damage.

1.5 SUBMITTALS

A. Shop Drawings: For excavation support, protection, and monitoring systems.

B. Delegated-Design Submittal: For excavation support and protection system indicated to comply with performance requirements and design criteria, including analysis data, calculations, and

plans, signed and sealed by the qualified professional engineer registered in the State of Connecticut responsible for their preparation.

C. Qualification Data: For qualified firms and persons specified in "Quality Assurance" article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Architects and Owners, and other information specified.

D. Other Informational Submittals:
   1. Photographs and Videotape – Preconstruction Survey shall include a detailed examination of the interior and exterior of structures located within 100 feet of the limits of all support of excavation work and the documentation of interior equipment and the manufacturers specified vibration tolerances if available. Color photographs, videotapes, and written descriptions shall be taken as required to document the condition of areas within the limits of the survey area. Particular notes shall be made of evident structural faults or deficiencies, or recent repairs. A description of machinery, processes, activities, etc. which may be subject to disturbance shall be noted. Objects or contents, which may be sensitive to vibration disturbances, shall also be noted. Show existing conditions of adjacent construction and site improvements that might be misconstrued as damage caused by the absence of, the installation of, or the performance of excavation support and protection systems. Submit before Work begins.
   2. Record Drawings: Identifying and locating existing utilities, structures, and other subsurface structural, electrical, or mechanical conditions.

E. A copy of the weekly settlement and lateral movement survey and the seismograph readings shall be submitted to the Owner and Geotechnical Engineer.

1.6 QUALITY ASSURANCE

A. The Contractor shall adhere to the applicable requirements of the Standard Specifications, OSHA Standards, and to all other applicable ordinances, codes, statutory rules and regulations of the Federal, State, and local authorities having jurisdiction.

B. Observation and Testing: The Owner will retain the Geotechnical Engineer to perform on-site observation and to witness testing and installation of select ESS. The Geotechnical Engineer shall be provided with sufficient notification and an adequate opportunity to observe and document the work. The Contractor shall cooperate with the Geotechnical Engineer to provide access to the work for observation, measurements, and testing. Review by the Owner or Geotechnical Engineer shall not relieve the Contractor from their responsibility for performing the Work in accordance with the Contractor Documents. The services of the Owner’s Geotechnical Engineer may include, but not be limited to the following:
   1. Observation and documentation during installation of ESS.
   2. Review of submittals/shop drawings for the ESS.
   3. The Geotechnical Engineer's presence does not include supervision or direction of the actual work by the Contractor, their employees or agents. Neither the presence of the Geotechnical Engineer, nor any observations and testing performed by them, shall excuse the Contractor from defects discovered in their work.

C. The Owner shall retain an independent testing agency to sample and test the temporary earth support system materials (e.g., concrete, shotcrete, mortar, grout, etc.). The testing agency's field representative taking the samples shall have at least three years of applicable experience. The Contractor shall provide access and such auxiliary personnel and services as needed to assist the testing agency to complete the work.

1.7 QUALIFICATIONS

A. Pre-installation Conference: Conduct conference at the Project site.

1. Review methods and procedures related to excavation support and protection system including, but not limited to, the following:
   a. Existing utilities and subsurface conditions.
   b. Proposed excavations.
   c. Proposed equipment.
   d. Monitoring (vibrations, settlement, lateral movement, distortion, etc) of excavation support and protection system.
   e. Working area location and stability.
   f. Abandonment or removal of excavation support and protection system.

B. Installer Qualifications: Engage an experienced installer to assume engineering responsibility and perform work of this Section who has a minimum of 10 years of experience specializing in the installation of excavation support and protection systems similar to those required for this project and with a record of successful in-service performance.

C. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the State of Connecticut and who is experienced in providing engineering services for designing excavation support and protection systems that are similar to those indicated for this project in material, design and extent.
1. Engineering Responsibility: Engage a qualified professional engineer to prepare or supervise the preparation of data for the excavation support design and protection system including drawings and comprehensive engineering analysis that shows the systems' compliance with specified requirements.
2. Provide plans, calculations, and specifications that are stamped and signed by a Registered Professional Engineer in the State of Connecticut.

1.8 DESIGN CRITERIA

A. These criteria are intended to serve as a guide to the Contractor in the design of the ESS for temporary lateral loading conditions and shall be regarded as the minimum acceptable. The Contractor shall be responsible for detailed designs which account for the varying field and subsurface conditions, using industry accepted design references.

B. The primary function of the ESS is to serve as a vertical and lateral support system to retain the overhead and/or adjacent soil, water, structures, utilities, streets, and other facilities and to protect them from damage due to settlement, lateral movements, loss-of-ground, vibration, or any other causes related to this construction.

C. The minimum required depth for the ESS shall be determined by the Contractor based on data made available and shall be subject to review by the Geotechnical Engineer.

D. The ESS shall be designed for the following minimum design criteria:
   1. Lateral pressures and design methods shall conform to accepted engineering practice, be performed in accordance with the Massachusetts State Building Code, and be performed, stamped and signed by a registered Professional Engineer registered in the Commonwealth of Massachusetts.
   2. Hydrostatic pressures as appropriate.
   3. Construction lateral surcharge loading of 250 psf minimum to account for surcharge associated with construction equipment. The Contractor and its design engineer shall verify that these pressures are appropriate for the selected construction equipment. Additional construction surcharge shall be considered and applied as appropriate.
   4. Apply surcharge for other structures as appropriate, in accordance with generally accepted engineering practices, such as those outlined in the Naval Facilities Design Manual 7.02, dated 1986.
   5. Provide a minimum factor of safety of 1.5 on passive pressure to calculate toe stability.
   6. The bottom of excavation used in the support of excavation design shall include 2 feet of over excavation below the footing elevation.
   7. The Contractor's design shall include development of detailed mitigating procedures and methods to be undertaken in the event that movements of the ESS result in movement of the ground, overhead structures, or adjacent structures.
   8. Drilled piles and tiebacks shall be installed using temporary casing to avoid possible loss of ground.
   9. If the ESS will be within the zone of influence of existing building foundations, the foundation loading shall be included as part of the ESS design.

1.9 PROJECT CONDITIONS

A. Interruption of Existing Utilities: Do not interrupt any utility serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility according to requirements indicated:

   1. Notify Owner no fewer than two days in advance of proposed interruption of utility.

   2. Do not proceed with interruption of utility without the Owner's written permission.

B. Project-Site Information: A geotechnical data report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner and geotechnical engineer will not be responsible for interpretations or conclusions drawn from the data.

C. Information in the Contract Plans and in the Specifications relating to subsurface conditions, existing utilities and structures is from the presently available sources. Such information is furnished only for the information and convenience of the Contractor, and the accuracy and completeness of this information is not guaranteed. The opinions expressed in this report are those of the Geotechnical Engineer and represent interpretations of the subsoil conditions,

tests, and results of analyses conducted by the Geotechnical Engineer. The Owner will not be responsible for interpretations or conclusions drawn from this data by the Contractor. Refer to Division 01, 01566 - Subsurface, Hydraulic, & Hydrologic Data , for available subsurface data. The documents are not part of the Contract Documents. The Contractor may, at his own expense and upon application to the Owner, conduct additional subsurface explorations and testing.

D. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
   1. During installation of excavation support and protection systems, regularly resurvey benchmarks and support monitoring points (for settlement and lateral movement), maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. The surveyor is to monitor the settlement and lateral movement of soils adjacent to existing construction near excavation area every two hours during the installation of the excavation support system and daily while the excavation is open. If the settlement and/or lateral movements exceed 80 percent of the limits as defined in the Contractor's monitoring plan as approved by the Engineer, then the installation shall stop and the methods of installation shall be reviewed and modified as required. Promptly notify Architect and/or Engineer if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.
   2. The Contractor shall monitor the peak particle velocities throughout the installation of the excavation support system. A minimum of one seismograph shall be used at each location where excavation support is being installed. The seismographs shall be monitored on a continuous basis by a qualified technician. If the peak particle velocity limits are exceeded, then work shall be stopped by the Contractor and the installation methods must be reviewed and modified as required.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that are either new or in serviceable condition.

B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.

C. Hot Rolled Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks. Cold rolled steel sheet piling will not be allowed where excavations extend below groundwater.

D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness as indicated in the Contractor's design.

E. Shotcrete: Comply with Section 033713 "Shotcrete" for shotcrete materials and mixes, reinforcement, and shotcrete application.

F. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.

G. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

H. Tiebacks: Steel bars, ASTM A 722/A 722M.

I. Tiebacks: Steel strand, ASTM A 416/A 416M.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.
   1. Shore, support, and protect utilities encountered.

B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities. Coordinate with the Owner for scheduling and maintaining traffic.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

C. Locate excavation support and protection systems clear of permanent construction so that forming and finishing of concrete surfaces are not impeded.

D. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.

E. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 SOLDIER PILES AND LAGGING

A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.

C. Install wales horizontally at required centers and secure to soldier piles.

D. No compressed air drilling will be allowed.

3.3 SHEET PILING

A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock to form a continuous barrier. Accurately place the piling, using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches. Accurately align exposed faces of sheet piling to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment. Cut tops of sheet piling to uniform elevation at top of excavation.

3.4 TIEBACKS

A. Tiebacks: Drill, install, grout, and tension tiebacks. Test load-carrying capacity of each tieback and replace and retest deficient tiebacks.
   1. Test loading shall be observed by a qualified professional engineer responsible for design of excavation support and protection system.
   2. Maintain tiebacks in place until permanent construction is able to withstand lateral soil and hydrostatic pressures.
   3. No compressed air drilling will be allowed.

3.5 BRACING

A. Bracing: Locate bracing to clear other work. If necessary to move brace, install new bracing before removing original brace.
   1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Engineer.
   2. Install internal bracing, if required, to prevent spreading or distortion of braced frames.
   3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth, hydrostatic, and other pressures.

3.6 REMOVAL AND REPAIRS

A. Removal of excavation support and protection systems shall be coordinated with the Owner and Geotechnical Engineer and shall not affect other permanent work. Remove excavation support when construction and/or backfilling has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing trench backfill soils, underlying soils, or damaging structures, pavements, facilities, and utilities.
   1. If excavation support and protection systems are to remain in place, remove the excavation support to a minimum depth of 48 inches below overlaying construction and abandon remainder.
   2. Fill voids immediately with approved backfill compacted to density specified in Section 02300 "Earthwork."
   3. Repair or replace, as approved by Owner, adjacent work damaged or displaced by removing excavation support and protection systems at no additional cost to the Owner.

PART 4 - MEASUREMENT AND PAYMENT

4.1 GENERAL

A. No separate measurement or payment will be made for associated work under this Section. Include all cost for work and materials covered by the section under the Contract Items for which miscellaneous metals are required.

END OF SECTION

SECTION 02373

RIPRAP

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, equipment, materials, tools, and accessories and perform all work necessary to construct the riprap slope protection system as indicated on the Contract Drawings and specified herein. The Work of this Section includes but is not limited to:

1. Recovery, salvage, and on-site management of existing revetment stone and riprap located within proposed the proposed limits of disturbance.
2. Provision of supplemental (imported) stone riprap materials in the quantity necessary to complete the Work.
3. Preparation of riprap protection subgrades.
4. Installation a crushed stone bedding layer.
5. Installation of a riprap armor layer.

B. It is the intent of this Project to reuse existing riprap and revetment stone materials encountered during excavation and site preparation activity necessary to complete the Work, to the maximum extent practical. The Contractor is advised that existing riprap and revetment stone is expected to be encountered based on review of prior construction documents, available subsurface data, and readily observable areas of the Site. The actual extents, quantities, and conditions of existing riprap and revetment stone at the Site are not known.

C. Crushed stone bedding material and riprap shall be sized as indicated on the Contract Drawings or as indicated in the Specification. The Contractor shall be responsible for all furnishing, processing, transportation, and placement necessary to achieve stone with quality and gradations meeting the specifications.

D. The Contractor shall recover, segregate, and stockpile existing, on-site (salvage) stone and rock material generated during excavation and site preparation that include particles exceeding the maximum stone size requirements for Granular Fill (Section 02300 Earthwork). The Contractor shall further process this salvaged stone or rock, if necessary, to generate existing riprap material suitable for reuse in the Work. Disposal of existing bulk materials containing existing stone or rock particles greater than the specified maximum sizes but are otherwise suitable for reuse in the work and, if necessary to complete the Work, their replacement with suitable imported materials shall be made at the Contractor’s expense.

E. Placement, intermediate grading, and final grading of areas of stone, rock, and riprap placement shall be included in the work of this section at no additional cost to the Owner. Such work may involve handling and placement of individual stones to achieve a stable slope at the lines and grades shown on the Plans. The cost of such work shall be included in the price bid for items which involve stone, rock, and riprap placement.

F. Adherence to the lines, grades, and slopes shown on the Contract Drawings is critical so as to meet permit requirements. Stone, rock, and riprap material placed by the Contractor shall not exceed the limits shown on the Drawings.

G. Stone, rock, and riprap placed as incidental work shall conform to the requirements of this Section, except as specified elsewhere.

1.2 RELATED SECTIONS

01010	SUMMARY OF WORK
01050	FIELD ENGINEERING
01060	REGULATORY REQUIREMENTS
01100	SPECIAL PROVISIONS
01110	ENVIRONMENTAL PROTECTION PROCEDURES
01300	SUBMITTALS
01500	TEMPORARY FACILITIES AND CONTROLS
01560	TEMPORARY EROSION AND SEDIMENT CONTROLS
01566	SUBSURFACE, HYDRAULIC, AND HYDROLIGIC DATA
01740	SITE RESTORATION
01900	MOBILIZATION / DEMOBILIZATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02110	CLEARING, GRUBBING, AND STRIPPING
02300	EARTHWORK
02373	RIPRAP
02375	GABIONS

1.3 REFERENCE STANDARDS

A. References herein to any technical society, organization, group or body 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:

1. ASTM: American Society for Testing and Materials
2. OSHA: Occupational Safety and Health Administration
3. AASHTO: American Association of State Highway Transportation Officials
4. CTDOT: Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction - Form 819 (2024)
5. USACE: United States Army Corps of Engineers

1.4 LAWS AND REGULATIONS

A. Work shall be accomplished in accordance with regulations of local, county, state and federal agencies and utility company standards as they apply.

1.5 QUALITY ASSURANCE

A. The Owner will retain and pay for the services of the Engineer to perform on-site observation the various phases of the construction operations. The services of the Engineer may include, but not necessarily be limited to, the following:

1. Observation of excavation and on-site material management and processing.

2. Laboratory testing and analysis of fill including but not limited to crushed stone and riprap, materials submitted as specified herein and proposed by the Contractor for incorporation into the Work.

3. Observation of subgrade preparation and installation of crushed stone bedding and riprap layers.

4. Assessment of the suitability of existing and imported materials for use in the Work.

B. The Contractor shall make provisions for allowing observations of Contractor's Work by the Engineer.

C. The presence of the Engineer does not include supervision or direction of the actual work of the Contractor, his employees or agents. Neither shall the presence of the Engineer, nor any observations performed by them, nor failure to give notice of defects excuse the Contractor from defects discovered in his work.

D. Costs related to correction of unacceptable qualities of work and failures discovered by observation shall be paid for by the Contractor at no additional expense to Owner, and the costs thereof will be deducted by the Owner from the Contract Sum.

1.6 SUBMITTALS

A. Submit descriptions of the proposed methods, procedures, equipment, and schedule to perform the riprap construction work, including segregation, downsizing, or otherwise processing stone materials as required herein and as indicated on the Contract Drawings.

B. Provide submittals for products, equipment, suppliers, samples, test reports, and other pertinent information required in accordance with Section 02300 Earthwork and applicable to this Section.

C. Three (3) weeks prior to the delivery of any riprap stone material to the site, submit the name and location of the proposed quarry(s) to be used to supply the imported riprap stone products. The Contractor shall provide the Engineer with information regarding the type and physical characteristics of the stone, as required below. Laboratory tests shall have been completed no more than 60 days prior to the submittal and shall have been performed on material from the same source as proposed for use. The Contractor shall also provide copies of any certifications or approvals of the quarries products from other agencies. It is the Contractor's responsibility to determine that the source selected can provide the quality, quantities and stone size needed at the rate needed to maintain the project schedule. If a source for supplemental stone is not accepted for use by the Engineer, the Contractor shall propose other sources. Approval of submitted samples, sources, or quarries shall not be construed as a waiver by the Engineer of the right to reject any stone that does not comply with the requirements noted herein.

D. If requested by the Engineer, the Contractor shall facilitate and participate in a field visit to the proposed Stone Riprap source quarry at no additional cost to the Owner.

PART 2. PRODUCTS

2.1 CRUSHED STONE BEDDING

A. Crushed stone bedding shall conform to the requirements of CTDOT M.01 for coarse aggregates and the gradation of No. 4 aggregate as defined by CTDOT Table M.01.02-2 (1.5-inch stone, nominal) and in accordance with Section 02300 Earthwork.

2.2 STONE RIPRAP

A. Riprap shall consist of hard, durable, non-soluble and sound angular stone which is resistant to weathering. Rounded stones or boulders, broken concrete, elongated, thin or flat pieces whose breadth or thickness is less than one-third its length will not be allowed. The parent rock for stone riprap shall be igneous or metamorphic rock. Sedimentary rock types such as shale, sandstone, or similar soft stone and soluble limestone and dolomite shall not be allowed. The stone shall be free of cracks, overburden, spoil, silt, clay, loam, organics and other deleterious matter. The size of a stone as specified herein shall be its least dimension. Stone Riprap shall conform the requirements of Intermediate Riprap per CTDOT M.12.02, the following gradation, or as modified herein.

Intermediate Riprap Gradation (CTDOT M.12.02):

Stone Size	% of the weight
18 inches	0
10 to 18 inches	30-50
6 to 10 inches	30-50
4 to 6 inches	20-30
2 to 4 inches	10-20
Less than 2 inches	0-10

B. Stone Riprap shall conform to the suitability requirements of the U.S. Army Corps of Engineers Engineering Manual (EM) 1110-2-2302, and shall conform to the following standards. If, in the opinion of the Engineer, testing of the proposed stone source is warranted, the Contractor shall be prepared to provide the results of one or more to the above tests and demonstrate conformance with the specifications.

1. Unit Weight: Dry unit weight 165 pcf or greater
2. Absorption: Less than 1 percent
3. Sulfate Soundness: Less than 5 percent loss per USACE method CRD-C 127 for Magnesium Sulfate.
4. Abrasion: Less than 20 percent loss for 500 revolutions based on the Los Angeles Abrasion Test per USACE method CRD-C 145.
5. Freezing-Thawing: Less than 10 percent loss for 12 cycles per USACE method CRD-C 144.
6. Drop Test: No breakage or cracking. The Contractor shall perform a Drop Test on representative samples of the stones to evaluate suitability. The test stone(s) shall be dropped from a bucket from a height half the average diameter of the stone or a minimum of 2 ft onto a rigid surface or second stone of comparable size. The stone shall be examined before testing as well as afterward. Stone(s) shall exhibit no breakage or cracking based on the Drop Test. Failure criteria are development of new cracks, opening of existing cracks, and loss of small pieces from the surface of the stone. The Drop Test shall be repeated as directed by the Engineer.
7. Wetting and Drying: Less than 5 percent breakdown after 10 cycles. Submerge stone in water for 18 hours, oven dry at 140°F, and cool to complete one cycle.
8. Solubility: None (no loss of mass). Oven dry at 140°F and weigh, submerge in representative water for 8 hours at 140°F, oven dry and reweigh.

C. Stone Riprap imported from an off-site source shall be of the same parent rock, from the same quarry, and shall be visually similar and acceptable to the Owner.

D. Control of gradation will be by visual inspection. The Contractor shall provide, prior to riprap placement, a representative sample of riprap stone for inspection. Any difference of opinion between the Engineer and the Contractor shall be resolved by dumping and checking the gradation of two random truckloads of stone. Mechanical equipment, a sorting site, and labor needed to assist in checking gradation shall be provided by the Contractor at no additional cost, if needed. Further checking may be called for at the quarry site to establish the weight distribution of the riprap material being supplied. The Contractor shall facilitate such checking at no additional cost to the Owner.

2.3 EXISTING STONE

A. Existing stone generated from on-site excavation and site preparation activity to be reused for riprap slope protection shall meet the requirements of Stone Riprap, except as modified herein, and provided the stone is assessed by the Engineer to be of suitable quality regarding size, shape, strength, density, durability, resistance to abrasion, and angularity and suitable for use in the Work.

B. Existing stone shall be clean and adequately free from foreign matter. Any foreign matter adhering to the stone shall be removed by the Contractor prior to placement.

C. Existing stone reused as riprap shall have at least three (3) flat faces prior to placement to enable the stones to be properly interlocked together to form a compact mass. No face dimension shall be less than 12 inches.

D. Existing stone with its least dimension greater than 18 inches may be incorporated into the work provided the stone meets the other specified requirements and, in the opinion of the engineer, can be manipulated and installed in the Work in an acceptable manner. If the condition of the existing stone is assessed to be too large to incorporate into the Work, as required, by the Engineer or Contractor, the Contractor shall process (downsize) the existing stone to produce suitable material.

2.4 REJECTION

A. If, during the course of the work, it is found that the stone being furnished by the Contractor does not fully meet all the requirements of these specifications, the Contractor shall be required to furnish other stone of acceptable quality. The Contractor shall remove and dispose of all rejected stone in a manner approved by the Engineer.

B. The right is reserved to reject materials from certain localized areas, zones, strata, or channels in the quarry when such materials area determined to be unsuitable.

PART 3. EXECUTION

3.1 GENERAL

A. The Contractor shall maintain and stockpile stone material in a safe, approved manner in accordance with all environmental requirements for the project and to protect existing structures and work.

B. The Contractor shall schedule work and deliveries to avoid impact to abutters and local traffic.

C. The Contractor shall order imported stone to supplement existing stone, based on conditions encountered. Prior to ordering stone, the Contractor shall recover and salvage existing stone, as feasible,

and as directed, so as to enable the Engineer and Contractor to evaluate size and quantity of imported stone required for the project.

D. The Contractor to transition repair/reconstruction work to existing to blend and match over a specific length, as defined, or as directed, to a maximum of twenty feet.

E. The Contractor shall coordinate excavation work during favorable weather conditions and at times when tidal water will not affect the work. Contractor to make provisions as necessary to control water during construction. Excavation and placement of materials below the water level will not be permitted.

F. Install temporary erosion and sediment controls prior to the start of additional earth disturbance and maintain temporary erosion and sediment controls continuously during construction in accordance with Section 01560.

G. Establish temporary facilities, construction laydown, and material storage areas as required, and as indicated on the Contract Drawings.

H. Perform clearing, grubbing, and stripping in accordance with Section 02110.

I. Perform related earthwork in accordance with Section 02300.

3.2 EXISTING STONE

A. Salvage existing riprap, revetment stone, and other stone encountered during excavation, grading, and other construction activity required to complete the Work within the limits of disturbance as indicated on the Contract Drawings.

B. Do not perform additional excavation for the purpose of extracting existing stone (i.e., mining) beyond what is required to complete the Work in accordance with related Sections and as indicated on the Contract Drawings unless authorized by the Owner.

C. Separate all existing stone with its least dimension greater than or equal to 6 inches or is larger than the maximum stone size requirements for Granular Fill (Section 02300) from other excavated material by mechanical means such as using slotted buckets, grapples, grizzly bars, and screens, or manually as applicable. Minor amounts of soil adhering to the existing stone after separation by mechanical or manual means may remain if acceptable to the Engineer.

D. Temporarily store the separated existing stone in stockpiles located within a designated material storage area. The Engineer will periodically assess the suitability of the separated existing stone for reuse as riprap. Segregate suitable existing stone, which may include oversized particles, from unsuitable materials. Remove and dispose of stone which, in the opinion of the Engineer, cannot be reused in the Work or permanently stored on-site in accordance with Section 02065 and related Sections.

E. Downsize existing stone that exceeds the maximum size requirements for Stone Riprap but is otherwise suitable for use in the Work using hydraulic hammers, by pre-drilling and splitting, or processing with rock crusher equipment until the process yields stone that meets the specified requirements.

3.3 RIPRAP CONSTRUCTION

A. Perform all necessary excavation, dewatering, filling, compaction, and grading required to provide a suitable subgrade surface for the proposed riprap to the lines and grades shown on the Contract Drawings, as required herein, in accordance with Section 02300 and related Sections, and as directed by the Engineer.

B. All riprap shall be underlain by crushed stone bedding material, except for riprap that is placed directly over concrete, stone-filled gabions, or bedrock. If in conflict, the required thickness of riprap shall be modified to accommodate the underlying concrete, stone-filled gabions, or bedrock without requiring removal.

C. Place and compact crushed stone bedding material over suitable subgrade, in lifts up to 6-inches thick, to the required layer thickness, lines, and grades indicated on the Contract Drawings. Perform compaction with vibratory plate compactor or by tamping with hydraulic equipment until the crushed stone bedding layer is stabilized and achieves an unyielding surface under the compaction effort and to the satisfaction of the Engineer.

D. Install riprap material over the crushed stone bedding material, concrete, or bedrock to the required layer thickness, lines, and grades indicated on the Contract Drawings. Place riprap material on the slope to its full layer thickness in one continuous operation as to produce a reasonably well-graded and stable mass of rock without localized areas of uniformly sized stones causing displacement of the underlying materials or other damage. Placement methods likely to cause segregation of the various stone sizes, such as dumping and pushing, spreading, or rolling the riprap down the slope will not be permitted.

E. Following the initial placement of riprap material, manipulate and rearrange the individual stones by mechanical or manual methods to obtain a reasonably well-graded distribution of the various stone sizes. Fill gaps between larger stones with smaller stones to obtain the minimum practical void space in the riprap layer.

F. Compact the riprap layer by tamping with the bucket of an excavator or other means acceptable to the Engineer.

G. Restore and gradually blend adjacent grades into the edge of the finished riprap in accordance with Sections 01740, 02300, and 02930; as required herein, as indicated on the Contract Drawings, and as directed by the Engineer.

3.4 TOLERANCES

A. No payment shall be made for riprap placed beyond the specified limits, as indicated on the Contract Drawing, or as herein extended. If required by the Owner or to comply with regulatory requirements, the Contractor shall remove riprap placed beyond these limits and restore those areas in-kind to match pre-construction conditions at the Contractor’s expense and to the satisfaction of the Owner.

B. Notwithstanding the other requirements indicated herein, the horizontal tolerance for riprap shall be within plus or minus 3 inches of the limits and dimensional requirements indicated on the Contract Drawings, except that riprap shall be terminated at the face of other existing and proposed structures to remain exposed at finished grade and located within the surrounding limits of riprap.

C. Stone Riprap layer thickness shall be defined as the typical (or average) layer thickness as measured perpendicular to ground surface or slope.

D. Flat sections of riprap at the top of the slope (crest), shall not be lower than the lines and grades indicated on the Contract Drawings. Individual riprap stones located on the crest shall not project more than 6 inches above the lines and grades indicated on the Contract Drawings.

E. Sloped sections of riprap and the riprap apron (at the toe of the slope), where required, shall be constructed to not more than 3 inches below or 6 inches above the lines, grades, and other controlling dimensions and requirements specified herein or as indicated on the Contract Drawings.

PART 4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment of Contract Item 02373.1 RIPRRAP SLOPE PROTECTION shall be based on the neat line dimensions and riprap layer section geometry as indicated on the Contract Drawings, and the calculated volume in cubic yards of satisfactory riprap protection; containing suitable existing, salvaged, or processed on-site stone or imported Stone Riprap; completed in accordance with this Specification, accepted, and measured in place.

B. There shall be no separate measurement or payment for quantities of salvaged existing riprap stone recovered, processed on-site, or otherwise reused in the Work or removed from the Site by the Contractor, which will be considered incidental to the Work of this Section.

C. Measurement and payment for Crushed Stone Bedding shall be in accordance with Section 02300.

D. There shall be no separate measurement or payment under this Section for excavation, grading, filling below the stone riprap, or any other work or materials incidental to the completion of and included in the price of other Contract Items.

E. No payment shall be made for quantities of materials not utilized in the construction of the project to meet established lines and grades as indicated on the Contract Drawings.

4.2 PAYMENT ITEMS

A. Payment of Contract Item 02373.1 RIPRRAP SLOPE PROTECTION shall be made at the contract unit price per cubic yard of riprap slope protection system, including but not limited to riprap crest, slope, and toe, where required, and incidental work installed and complete to the lines and grades indicated on the Contract Drawings. This price shall include full compensation for all for all survey; supervision; equipment; labor; materials; testing; handling; storage; excavation; subgrade preparation; installation; recovery, salvage, processing, and reuse of existing materials; provision and installation of imported Stone Riprap; grading; compaction; cleanup; restoration; disposal of waste or excess materials incidental or appurtenant work required to complete the riprap slope construction; as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work of this Section which is not included in other items.

ITEM NO.	PAYMENT ITEM	UNIT
02373.1	RIPRAP SLOPE PROTECTION	CUBIC YARD

END OF SECTION

SECTION 02375

GABIONS

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, equipment, materials, tools, and accessories to complete the Work of this Section. Work under this section shall consist of design, fabrication, installation, and any other incidental work required to complete the construction of the Gabion Retaining Wall as required, and as indicated on the Contract Drawings. The Work of this Section includes but is not limited to:

1. Engineering design, calculations, shop drawings, and other required submittals for the Gabion Retaining Wall.
2. Excavation, grading, dewatering, subgrade preparation, backfilling and other incidental earthwork necessary for installation of the Gabion Retaining Wall in accordance with this Section and Section 02300 – Earthwork.
3. Supplying, transportation, and placement of all required materials.
4. Disposal of all excess or unsuitable materials provided for or generated by the work.
5. Furnishing and installing required base course materials, geotextiles, and gabion stone fill.
6. Furnishing, assembling, and installing gabion baskets.
7. Coordination and sequencing the construction of the Gabion Retaining Wall with other work of the Contract and with the Owner and Engineer.
8. Conducting all work in accordance with OSHA requirements and other applicable laws and regulations, and with the requirements of all federal, state, and local agencies and authorities having jurisdiction over the work.

1.2 REFERENCES

1. American Society for Testing and Materials (ASTM)
   a. ASTM A975 - Standard Specification for Double-Twisted Hexagonal Mesh Gabions and Revet Mattresses (Metallic-Coated Steel Wire or Metallic-Coated Steel Wire With Polymer Coating)
2. State of Connecticut Department of Transportation - Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction - Form 819 (2024)
3. The Connecticut State Building Code (CSBC)

1.3 RELATED SECTIONS

01010	SUMMARY OF WORK
01050	FIELD ENGINEERING
01060	REGULATORY REQUIREMENTS
01100	SPECIAL PROVISIONS
01110	ENVIRONMENTAL PROTECTION PROCEDURES
01200	PROJECT COORDINATION AND MEETINGS
01300	SUBMITTALS

01500 TEMPORARY FACILITIES AND CONTROLS
01560 TEMPORARY EROSION AND SEDIMENT CONTROLS
01566 SUBSURFACE, HYDRAULIC, AND HYDROLIGIC DATA
01740 SITE RESTORATION
01900 MOBILIZATION / DEMOBILIZATION
02065 DEMOLITION, REMOVAL, AND DISPOSAL
02110 CLEARING, GRUBBING, AND STRIPPING
02300 EARTHWORK
02373 RIPRAP
02465 AUGER CAST PILES
02475 DRILLED MICROPILES
02930 LOAMING, SEEDING, AND REVEGETATION
03300 CAST-IN-PLACE CONCRETE
05500 MISCELLANEOUS METALS

1.4 SUBMITTALS

A. Not less than two (2) weeks prior to the scheduled installation of the Gabion Retaining Wall, the Contractor shall submit a design that shall include, at a minimum, the following:

1. Proposed layout and sequence of installation. Provide shop drawings and written instructions that describe the layout, sequence of installation, and staged backfilling to the levels of detail and accuracy necessary for the Contractor's personnel to properly locate and construct the Gabion Retaining Wall. The locations and details shown on the Contract Drawings represent the maximum available area. Any layout outside of the specified area shall only be used with written permission from Owner and no permission for additional space is guaranteed, if requested.

2. All materials and equipment proposed to be used for the work of this Section.

   a. Submit gabion basket manufacturer's product literature, data, installation instructions, and any other pertinent information about the gabion baskets.

   b. Submit geotextile, soil, and rock material data in accordance with Section 02300 – Earthwork, and as specified herein.

3. Gabion Retaining Walls shall include a design submittal stamped by a qualified, registered Professional Engineer (P.E.) licensed in the State of Connecticut. The design shall include a check of bearing capacity, sliding, overturning and internal safety (if required such as grid pullout, etc.) and take into account all anticipated surcharge pressures from the earthwork, pile foundation, and concrete sub-contractors (soil, equipment, etc.). Coordination with the various sub-contractors is included herein as a requirement of this Section. The design submittal shall include specification of all required materials (drainage, backfill, blocks, gabions, geogrids, geotextiles, etc.) for the Gabion Retaining Wall design.

4. Drawings shall be included with the submission showing the available area for the Gabion Retaining Wall, typical and representative section views of the Gabion Retaining Wall construction, and any other pertinent information required for wall performance. Provide profile or elevation-view drawings of the Gabion Retaining Wall to describe the heights of the gabions (bottom and top, including transitions if any) relative to finished grades at the outside (flood-side) face. Provide details for any utility penetrations located in the Gabion Retaining Wall.

1.5 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall inspect all Gabion Retaining Wall materials upon delivery to ensure that the proper type, grade, and color of materials have been delivered.

B. The Contractor shall store and handle all materials in accordance with the manufacturer's recommendations and in a manner that prevents deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, UV exposure or other causes. Damaged materials shall not be incorporated into the work.

C. All geosynthetic materials shall be handled in accordance with ASTM D4873. The materials should be stored off the ground and protected from precipitation, sunlight, dirt and physical damage.

D. Material stockpiles shall not be located over unstable slopes or areas of the project site with buried utilities.

E. Open-graded fill materials such as crushed stone bedding/base course, filter stone, or gabion stone shall not be staged where it may become mixed with or contaminated by poor draining fine-grained soils such as clay or silt.

PART 2. PRODUCTS

2.1 MATERIALS

A. All materials shall be in accordance with the reviewed Gabion Retaining Wall Design submittal.

B. All materials shall used for the construction of the Gabion Retaining Walls shall be new, or like new. Materials that are damaged, vandalized, or miscolored shall not be used.

C. Gabion baskets shall be produced from double-twisted, metallic-coated 8 by 10 wire mesh, lacing wire, and stiffeners with polymer coating applied after the metallic coating that meets the requirements of ASTM A975, style 3 coating. Fasteners shall be stainless steel wire. The exterior polymer coating shall be colored gray and consistent throughout the project.

D. Gabion Stone (aggregate) shall meet the requirements of CTDOT M.12.02, except that each side of the aggregate shall be at least 4 inches and not more than 13 inches or 7/10 of the basket's smallest dimension, whichever is less, or as otherwise required by the gabion design, and in accordance with the gabion basket manufacturer's recommendations. It shall be reasonably well graded between the limiting sizes.

E. Nonwoven Geotextile Fabric shall be in accordance with Specification Section 02300 – Earthwork.

PART 3. EXECUTION

3.1 GENERAL

A. Design, deliver, handle, and install the Gabion Retaining Walls in accordance with this Section and the reviewed design submittal.

B. Perform all related incidental work in accordance with Section 02300 – Earthwork and related Sections.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Measurement and payment for Contract Item 02375.01 GABION WALL shall be made at the contract unit price per cubic yard of Gabion Retaining Wall installed, and complete to the locations and conditions indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; engineering design, calculations, shop drawings, and product selection; excavation and backfill; aggregate base course; coated gabion baskets; gabion stone; geotextile; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified. Measurement for payment shall be based on the nominal design dimensions of the stone-filled gabion baskets installed and the corresponding calculated volume in cubic yards. There shall be no separate measurement or payment under this item for excavation, subgrade preparation, foundation base course, geotextile, gabion stone, or other items required to complete Gabion Retaining Wall work, which will be considered incidental and included in the contract unit price of this item.

B. PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
02375.01	GABION WALL	CUBIC YARD

END OF SECTION

SECTION 02465

AUGER CAST PILES

PART 1. GENERAL

1.1 GENERAL PROVISIONS

A. Coordinate Work with that of all other trades or contracts affecting or affected by Work of this Section. Cooperate with such trades to assure the steady progress of all Work under the Contract.

1.2 DESCRIPTION OF WORK

A. Augercast piles (ACPs) shall consist of continuous flight auger piles (CFA pile). Provide all labor, materials, tools, equipment and experienced supervision necessary to install ACPs at the locations shown on the Plans and in accordance with this specification. The work includes the following:

1. Construction of 24-inch diameter ACPs. Piles lengths will vary as indicated on the drawings (refer to Sheet S-301).
2. Casting and reinforcing of all piles and installing reinforcement as shown on drawings; cutting, leveling, and preparing the pile tops for the construction (by others) of concrete mats, concrete pile caps and grade beams.
3. Providing test pile and performing a static axial load test in tension to two times design load.

B. The Contractor to provide access and coordination for the Engineer to perform Non-Destructive Testing (NDT) of the test pile and 3% of production piles using Thermal Integrity Profiling (TIP).

1.3 RELATED SECTIONS

A. Section 02300 – Earthwork

B. Section 03300 – Cast-in-place Concrete

1.4 DEFINITIONS

A. ACP Pile: Defined as a continuous flight auger pile intended to install a cast-in-place pile. ACPs are made by rotating a hollow-stem auger into the ground to the specified pile depth. Grout or concrete is injected through the auger shaft under continuous positive pressure, as the auger is being withdrawn, in order to exert a positive upward pressure on the earth-filled auger flights as well as lateral pressure on the soil surrounding the placed grout or concrete column. Reinforcing steel, as specified, is inserted into the column of fluid grout or concrete following the completion of grout or concrete placement.

B. Test ACP: An ACP that is installed to load test in compression. The test ACP may be installed at a production pile location. The test ACPs shall be installed and tested prior to production ACPs.

C. Cementitious Materials: Portland cement and any pozzolanic material such as fly ash, natural pozzolans, ground granulated blast-furnace slag and silica fume.

D. Design Strength (f’c): Specified compressive strength of concrete at the time specified to meet structural design criteria.

E. Pozzolan: Siliceous or siliceous and aluminous material, which in itself possesses little or no cementitious value but will, in finely divided form and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties.

F. Water: Water shall be fresh clean, and free from sewage, oil, acid, alkali, salts, or organic matter.

G. ACP Contractor: The specialty ACP contractor responsible for installing and load testing ACPs.

H. General Contractor: The contractor responsible for executing the overall project and responsible for providing support for the ACP Contractor.

I. Geotechnical Engineer: GZA GeoEnvironmental, Inc.

J. Engineer: GZA GeoEnvironmental, Inc.

K. Owner: Town of Stratford

1.5 SUBMITTALS

A. Engineer's Review

1. All reviews are subject to trial and satisfactory field performance. The Engineer's review does not relieve the Contractor of his responsibility to satisfactorily complete the work detailed on the project plans and specifications.

2. Changes in methods, personnel, or equipment will not be allowed after the review of the Equipment and Installation Plan without the written consent of the Engineer.

B. Prior Experience

1. Submit proof and details of the following with bid documents:
   a. Ten projects in the past 5 years where the Contractor has performed work successfully in the installation of ACPs similar to the size, quantity and type on this project.
   b. The Contractor's foreman/superintendent for this work having supervised the successful installation of ACPs similar to the size, quantity and type on this project.

C. Equipment and Installation Plan

1. The ACP Contractor shall submit the proposed procedure and equipment for installing ACPs to the Engineer for review and comment prior to commencing work. The submittal should include, but not be limited to, the following information.
   a. List and sizes of proposed equipment, including drilling rigs, augers and other drilling tools, pumps for grout or concrete, mixing equipment, and similar equipment to be used in construction, including details of procedures for calibrating equipment as required.
   b. Description and specification of automated installation-monitoring equipment to be used. As a minimum, the submittal shall contain the following information:
      1) Manufacturer and model of the equipment and components.
      2) Description of equipment function.
      3) Sample of the information collected and printout provided.
      4) Certification that the equipment can provide the information outlined in this Specification.
      5) Records indicating that the equipment has been calibrated within the past 6 months.

c. Step-by-step description of pile installation procedures.
d. A plan of the sequence of pile installation.
e. Details of methods of reinforcement placement, including support for reinforcing cages at the top of the pile and methods for centering the cages within the grout or concrete column.
f. Details of methods to be used to remove soil and debris from the top of pile after grouting.
g. Details of materials and methods to be used for centering reinforcing in the piles and maintaining required cover.
h. Mix designs for all grout or concrete to be used on the project, including slump loss vs. time curves and strength development vs. time curves for mixes with fly ash and/or slag. Mix design shall include either:
    1) Laboratory tests of trial mixes made with the proposed materials, or
    2) Laboratory tests of the proposed mix used on previous projects.
i. Equipment and procedures for monitoring and recording auger rotation speed, auger penetration rates, auger depths, and crowd pressures during installation.
j. Equipment and procedures for monitoring and recording grout or concrete pressures and volumes placed during installation.
k. Contingency plans for equipment failures during drilling or grouting operations (grout pump, monitoring equipment, etc.).

D. Load Test Plan:

1. The ACP Contractor shall submit the proposed equipment for load testing ACPs to the Engineer for review prior to commencing work. The submittal shall include, but not be limited to, the following:
    a. General load test setup including location of reaction piles and reference piles.
    b. Depth and estimated capacity of reaction piles.
    c. Load frame design stamped by a Professional Engineering licensed in Connecticut.
    d. Quantity and location of pile-head deflection measuring equipment.
    e. Calibration report for complete load equipment, including hydraulic jack, load cell, pump and pressure gage.

E. Pile Substitution

1. If the Contractor proposes an alternate pile type or dimensions that vary from the design drawings, a design submittal must be submitted by the Contractor and reviewed by the engineer. The design must be prepared by a professional engineer licensed in the State of Connecticut. The pile design must meet or exceed the minimum design loads on Sheet S-301. The design must consider group effects and downdrag due to organic soil consolidation. The design must be in accordance with the State of Connecticut Building Code and consider the site constraints which may limit pile construction. There is no guarantee that the proposed pile substitution will be approved.

1.6 PROJECT CONDITIONS

A. Visit the site to review all details of the work and working conditions and to verify dimensions in the field including interference from adjacent structures and utilities. Notify the Owner / Geotechnical Engineer in writing of any discrepancy before performing any work.

B. Consult official records and project drawings of existing above and below grade utilities, and their connections, to be fully informed of all existing and proposed conditions and limitations as they apply to this work and its relation to other construction work.

C. Protect existing utilities to remain within the work area in accordance with the requirements of authorities having jurisdiction.

D. By submitting a Bid, the ACP Contractor affirms that the site and all conditions affecting the Work under this Section have been carefully examined. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions as indicated in the Contract Documents and other provided information, or obvious from observation at the site.

E. Protect nearby structures from damage during ACP installation. All construction induced damage shall be repaired by the Contractor to the satisfaction of the Owner at the Contractor's expense.

F. The Site is located at the Stratford Water Pollution Control Facility which will remain open and active during construction of the Flood Protection System Improvement project. All construction work must be coordinated with Stratford WPCF to maintain operations. The Contractor shall not be compensated for any delays or extra costs associated with any special measures required to perform the Work of this Contract according to the Project Documents.

G. The Contractor is alerted to overhead utilities which may interfere with micropile installation along Birdseye Street, Beacon Point Road and the Stratford Animal Shelter driveway. The Contractor shall not be compensated for any delays or extra costs associated with any special measures required to perform the Work of this Contract according to the Project Documents.

1.7 SUBSURFACE SOIL DATA

A. A Geotechnical Engineering and Environmental Data Report dated February 20, 2023 were prepared for the Project by GZA GeoEnvironmental, Inc. The data included in the Geotechnical Engineering Report is for general information and is accurate only at the particular locations and time the subsurface explorations were made. It is the Contractor's responsibility to make interpretations and draw conclusions based on the character of materials to be encountered and the impact on his/her work based on his/her expert knowledge of the area and of pile installation techniques.

1.8 QUALITY ASSURANCE

A. Comply with all rules, regulations, laws, permits and ordinances of the State of Connecticut and the Town of Stratford, and all other authorities having jurisdiction. All labor, materials, equipment, and services necessary to make work comply with such requirements shall be provided without additional cost to the Owner.

B. The ACP Contractor shall maintain accurate records for each pile constructed. Similar records will be maintained by the Geotechnical Engineer. These records shall show:

1. Pile location;
2. Ground surface elevation (reference grade for pile length);
3. Pile toe (bottom) depth and elevation;
4. Elevation of top of grout or concrete;

5. Pile length;
6. Auger diameter;
7. Details of the reinforcing steel (number, size, and grade of longitudinal bars, size and spacing of transverse steel; outside diameter and length of cage);
8. Flow cone efflux time and volume of grout placed or slump and volume of concrete placed;
9. Theoretical volume of drilled hole (theoretical diameter = diameter of auger);
10. Depth to which reinforcing steel was placed;
11. Date/Time of beginning of drilling;
12. Date/Time of completion of drilling;
13. Date/Time grout or concrete was mixed;
14. Date/Time ready-mix grout or concrete truck arrived at project site, and copies of all grout or concrete batch tickets used for the pile construction;
15. Date/Time of beginning of grout or concrete pumping;
16. Date/Time of completion of grout or concrete pumping;
17. Date/Time of placement of reinforcing steel;
18. Weather conditions, including air temperature, at time of grout or concrete placement;
19. Identification of all grout or concrete samples taken from the pile;
20. All other pertinent data relative to the pile installation; and
21. All readings made by the automated measuring and recording equipment to include as a minimum:
    a. Auger rotation verses depth for every 2 ft (0.6 m) increment, or less, of pile advancement during the drilling process, and during placement of grout or concrete (if auger is rotated during this placement);
    b. Volume of grout or concrete placed versus depth of outlet orifice for every 2 ft (0.6 m) increment, or less, of pile placed;
    c. Average maximum and minimum pump stroke pressures at ground level for every 2 ft (0.6 m) increment, or less, of pile placed;
    d. Average maximum and minimum pump stroke pressure at or near the auger head for every 2 ft (0.6 m) increment, or less, of pile placed, if directed by the Engineer; and
    e. Torque and crowd force (downward thrust on auger) measurements for every 2 ft (0.6 m) increment, or less, of pile advancement during the drilling process.
22. Upon completion of grouting for each pile, ACP Contractor shall submit a printed copy of the automated measuring and recording equipment output to the Geotechnical Engineer.
23. At the end of each working day, ACP Contractor shall provide electronic raw data from the automated measuring and recording equipment to the Geotechnical Engineer within 24 hours of the completion of the pile. Data collected by automated measuring and recording equipment shall be provided in numerical or graphical form.

C. All products shall be installed in accordance with the manufacturer's recommendations

1.9 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection:

1. The rebar cages shall be stored and protected to avoid damage and shall be picked up in a manner that will avoid damage. If rebar cages are damaged due to improper storage or handling as determined by the Geotechnical Engineer, they shall be rejected and replaced at no additional cost to the Owner.

PART 2. PRODUCTS

2.1 MATERIALS

A. Steel Reinforcement

1. Reinforcing bars for cages shall conform to ASTM A615, Grade 60.

2. Acceptable methods shall be provided to facilitate proper centering of reinforcing installed in piles.

B. Grout

1. Portland cement shall conform to current ASTM standards, designation C150.

2. Mineral admixtures, if used, shall be flyash or natural pozzolan which possess the property of combining with the lime liberated during the process of hydration of Portland cement to form compounds containing cementitious properties. The material shall conform to ASTM C618, Class C or Class F.

3. Chemical Admixtures supplied by the ready-mix producer shall conform to ASTM C494 and might consist of, but not be limited to water reducers and/or set retarders. Grout fluidifer, when utilized, shall conform to ASTM C937.

4. Water shall be potable, fresh, clean, and free of sewage, oil, acid, alkali, salts, organic matter, suspended solids, or other materials that may be detrimental to the grout quality. Recycled/reclaimed water be used provided its inclusion and associated temperature does not adversely impact the design compressive strength of the mix. The amount of water, including surface or free moisture in the aggregates, shall be measured and controlled so that the water-cement ratio of each mix shall be accurately obtained.

5. Fine Aggregate: Sand utilized as fine aggregate shall meet the requirements of ASTM C33.

C. Grout Mixes

1. The grout shall consist of Portland cement, fine aggregate, and water, and may also contain a mineral admixture and approved fluidifer. The components shall be proportioned and mixed to produce a grout capable of maintaining the solids in suspension and being efficiently pumped. These materials shall be proportioned to produce a hardened grout which will achieve the design

unconfined compressive strength within 28 days. The design unconfined compressive 28-day grout strength for this project shall be 5,000 pounds per square inch (psi).

2. All material shall be accurately measured as it is fed to the mixer. Time of mixing shall be not less than one minute at the site. If agitated continuously, the grout may be held in the mixer or agitator for a period not exceeding 2.5 hours at grout temperatures below 70° F and for a period not exceeding 2 hours at temperatures not exceeding 100° F. Grout shall not be placed when its temperature falls below 40° F or exceeds 100° F, unless approved procedures for cold or hot weather grouting are following. Protect grout from physical damage or reduced strength which could be caused by frost, freezing action, or low temperature or from damage during high temperatures in accordance with ACI 305/306. When ambient outdoor temperatures exceed 95° F, it is permissible to allow a grout temperature of up to 105° F provided the mixing time is reduced to 1.5 hours and a set retarder is added to the mix.

3. The grout mix shall be sampled and tested by making a set of six (6) 2-inch cubes for each 50 cubic yards of grout placed, or at least one set for each day during which piles are installed. The grout samples shall be sampled and tested by an independent testing laboratory. The test results shall be provided to the Geotechnical Engineer within 24 hours of performing the compression tests. Cubes shall be cured and tested in accordance with ASTM C109.

4. A set of grout samples shall be taken/tested from each truck of grout delivered during test pile installation. Two cubes shall be compression tested at 7 days, two cubes tested at 28 days, and two cubes held in reserve.

5. The flow of each batch of grout shall be tested according to ASTM C939, modified to a ¾-inch opening. The flow cone rate should be between 10 and 25 seconds. Grout with flows greater than 25 seconds may be used at the ACP Contractor's discretion, provided the design unconfined compressive strength is obtained. A set of grout cube samples shall be taken/tested for grout batches with flows greater than 25 seconds.

6. The amount of water and/or grout admixture added in the field to any grout batch shall be recorded by the Contractor and provided to the Geotechnical Engineer.

2.2 EQUIPMENT

A. Auger Equipment

1. The auger flighting shall be continuous from the auger tip to the top of auger without gaps or other breaks. The outside diameter of the auger shall be at least 97% of the design diameter of the pile. The auger cutting teeth shall be regularly inspected for wear, and shall be replaced if the above specified diameter tolerance is not met. The hole through which the grout is pumped into the pile shall be located at the bottom of the auger tip below the cutting teeth.

2. The auger shall be guided at the ground surface by a bottom guide connected to the leads of the ACP piling rig.

3. If piling leads are used, they shall be prevented from rotating by a stabilizing arm, by firmly placing the bottom of the leads into the ground, or by some other acceptable means. Leads shall be marked at 1-foot intervals numbered at least every 5 feet to facilitate measurement of auger penetration.

4. The drilling equipment shall be capable of developing a minimum of 150,000 ft-lbs of torque, and a minimum downward force of 30,000 pounds.

B. Mixing and Pumping Equipment

1. Only mixing and pumping equipment included in the Equipment and Installation Plan shall be used in the preparation and handling of the grout. A screen shall be used between the delivery point from a ready-mix truck and the pump to remove large particles or cement clumps that can clog the grout injection system. A screen with a mesh with openings no larger than ¾ inch shall be used for grout and openings no larger than 4 inches for concrete shall be used.

2. All oil and other rust inhibitors shall be removed from mixing drums and grout pumps. All materials shall be such as to produce a homogeneous grout of the desired consistency and strength.

3. The grout pump shall be a positive displacement pump capable of developing displacement pressures at the pump not less than 350 psi. The pump shall be sized appropriately to the pile size such that a smooth, continuous delivery of grout can be maintained while limiting the pressure variations (particularly the pressure drop) felt by the pile due to the pump strokes. The ACP Contractor shall provide the Engineer with the value of the volume of grout or concrete delivered.

4. The grout pump shall be calibrated at the beginning of the work to determine the volume of grout pumped per stroke and should be periodically recalibrated when deemed necessary by the Geotechnical Engineer. A positive method of measuring grout volume shall be provided by the ACP Contractor. Such methods may include digital or mechanical stroke counters, electronic flow meters, or other acceptable methods.

C. Automated Monitoring Equipment

1. The drill rig shall include automated monitoring equipment having the following components:

a. Display and Recording Unit: Display numerically and/or graphically the collected information from various sensors and record results for permanent record. This unit shall be mounted in the cab to provide immediate feedback to the operator, particularly during the critical grouting phase to verify minimum grout volume per depth increment. The results should be stored in electronic format for possible further evaluation. A real time clock should be included in the display unit that shows time to the nearest second.

b. Depth Sensor: Monitors auger tip depth at all times during installation. The depth sensor should record pile depth referenced to the ground elevation. Installation and withdrawal rate should be calculated and displayed in real time from the recorded depth versus time values.

c. Magnetic Flow Meter: installed in the grout line near the drill rig to measure grout volume pumped within accuracy of 2%+/-. Incremental flow and total volume should be displayed in real time.

d. The monitoring equipment shall also record the following at 2-foot intervals over the entire length of the pile installation:

1) Auger rotation speed (rpm)

2) Depth of auger injection point (ft)

3) Torque delivered to auger (ft-lb)

4) Crowd force (lbs)

2. A record of the pile installation should be immediately available in the field to the Geotechnical Engineer upon installation completion. This may be accomplished by the following:

a. Real-time display on a remote device of recorded and calculated parameters as the pile is being drilled and grouted.

b. Access to viewable digital installation record.

c. Field printed hard copy of the installation record.

3. Calibration shall be made on all measuring and recording equipment at the beginning of the project that will demonstrate that the values indicated by the measuring and recording equipment are within 3% of the values indicated. Calibrations shall be performed in accordance with the equipment manufacturer's specifications. All measuring and recording equipment shall also be recalibrated if the Geotechnical Engineer suspects that the drilling and grouting or concreting performance has changed.

PART 3. EXECUTION

3.1 SITE PREPARATION

A. Removal of all surface or subsurface topsoil, brush, organic material, and other unacceptable material in accordance with the requirements of the contract documents. Removal of any surface or subsurface obstructions to the ACP work.

B. Vacuum excavation or pre-excavating to avoid the potential for damaging existing underground utilities as required by Owner and Engineer at select ACP locations, anticipated to extend as deep as 8 feet below existing site grades.

C. Site shall be graded to an agreed working elevation. A dry, level, and stable working platform shall be provided and maintained throughout the work. Platform stability should be evaluated by the general contractor, based on equipment information provided by the specialty contractor.

D. Provision of all-weather access and maintenance thereof for the ACP Contractor's equipment and workforce, and for delivery of materials to the worksite.

E. Survey and location of piles in the field, with pile number and working surface elevation. Replace pins, flags or stakes when damaged during the course of the work.

3.2 TEST PILE PROGRAM

A. One test pile shall be constructed and load tested to verify the design pile capacities. The location of the test piles shall be agreed upon between the ACP Contractor, Geotechnical Engineer, and the Owner. Preliminary preferred location is in the vicinity of station 7+00 to 11+12.56, offset from the production

area of the proposed floodwall alignment. Test pile area is expected to included existing fill and organic deposits above the bearing layer.

B. The test pile shall be sacrificial and shall not be reused as a production pile. The ACP Contractor shall provide complete load testing materials and equipment as required, install test and reaction piles, and perform the load tests in the presence of the Geotechnical Engineer.

C. The installation equipment and methods during test pile installation shall be the same as that used for production pile installation.

D. Test piles shall be installed in accordance with procedures required for production piles and ACP Contractor shall submit to Geotechnical Engineer all information required for production piles. Test pile tip elevation shall be to the lowest tip elevation for ACP piles specified in the drawings.

E. Production piles shall not be installed until review and comment of test pile load test results has been completed by the Geotechnical Engineer. Production pile installation criteria may require modification based on the test pile program.

F. Load tests shall be performed in compression following procedures of ASTM D1143, Quick Test. Maximum test loads shall be:

1. 24-inch Diameter ACP: 222 kips (two times the design load of 111 kips)

G. Static pile load testing shall be performed only in the presence of the Geotechnical Engineer.

H. Strain gauges shall be installed in pairs at the 6 depths between the top and bottom of the pile. Preliminary strain gauge locations are to be at: 5 feet below grade at top of pile, bottom of existing fill/top of organic deposits, bottom of organic deposit/top of natural outwash deposit, 10 feet below top of outwash deposit, 15 feet below top of outwash deposits, and 5 feet above bottom of pile.

I. Use the same size and type of test pile as specified for other ACP used for this project and installed in the same manner. Contractor is to increase test load and provide strain gauges to ensure the test load reaches the design bond zone.

J. Do not begin load test until grout reaches the required design compressive strength. Allow a minimum of 3 days for the grout to cure. The Owner or their representative will sample and test grout during test pile installation as specified herein.

K. Provide sufficient protection from the elements (rain, wind, etc.) and heating during the load test, as required, which could affect the test results.

L. Apply test loads and record load-deformation data in accordance with ASTM D1143 – Procedure A: Quick Test. In no case shall a load be changed if the rate of settlement is not decreasing with time.

M. The allowable design capacity will be taken as the lesser of the following:

1. 50 percent of the maximum applied test load; or
2. 50 percent of the failure load.

N. Failure load is defined as the test load where displacement reaches 5% of the pile diameter, equal to 1.2 inches for 24-inch diameter pile; or pile reaches plunging failure defined as increase in net settlement disproportionate to the load increase.

O. Piles will be approved for the design load provided that the load-settlement curves show no signs of failure.

P. If test piles do not conform to the specified requirements, provide additional test piles and testing at no additional cost to the Owner.

Q. Submit load test report to Geotechnical Engineer for review within 2 days following completion of each test. Drilling for production ACPs shall not begin until load test report has been reviewed by the Geotechnical Engineer. Load test reports shall include the following:

1. All test pile record information specified in Article 1.8 of this Section, including a scale drawing of test piles showing all relevant construction details and subsurface conditions encountered during installation.

2. Tabular and graphical summary of the specified load-deformation data.

3. Brief memorandum summarizing testing procedure, test results, and recommended allowable design load.

R. Test piles shall include TIP equipment, supplied and installed by the Geotechnical Engineer. The ACP Contractor shall provide adequate access and support to the Geotechnical Engineer to allow installation of TIP equipment.

1. Contractor shall provide a center bar for the full length of the test pile to support the TIP equipment and instrumentation.

S. The final pile lengths may be adjusted by GZA based on the load test results.

3.3 INSTALLATION PROCEDURE

A. Piles shall be located as shown on the drawings. Pile centers shall be located to within 3 inches of planned location. Piles shall be plumb within 2 percent.

B. Drilling shall not commence until sufficient supply of grout or concrete is present on the project site to complete the pile.

C. The auger shall not be extracted from the ground at any time during the construction of a pile in such a way that would result in an open, unsupported borehole or inflow of water into the borehole.

D. The auger shall be advanced into the ground at a continuous rate and at a rate of rotation that prevents excess spoil from being transported to the ground surface.

E. Install piles to depths indicated on the plan. Verify depth to bearing layer during installation.

F. Notify engineer if auger refusal is encountered prior to design depth. Auger refusal is defined as a rate of auger penetration of less than 1 foot per minute of drilling under a down pressure (crowd) of 50 kips or more.

G. The placement of grout or concrete shall commence within 15 minutes after the auger has achieved the installation criteria.

H. The hole at the bottom of the hollow stem auger shall be closed with a suitable plug or charged with compressed air to prevent soil intrusion into the stem while being advanced into the ground. The plug shall be removed by grout pressure of with the reinforcing bar.

I. At the start of grout pumping, lift the auger from 6 to 12 inches off the bottom to facilitate expelling the tip plug. The auger shall then be lowered back down to the previously established drilling depth.

J. Prior to raising the auger, a minimum theoretical initial grout head of 5 feet shall be pumped. The auger shall be extracted at a smooth, steady rate while continuously pumping. If rotation of the auger occurs during auger extraction, it shall be positive, i.e. in the same direction as during drilling. The rate of grout injection and auger withdrawal shall be coordinated so as to maintain the following: the minimum grout head at all times, and the total volume of grout to be at least 115 percent of the theoretical volume for each pile depth increment.

K. After grout is flowing at the ground surface from the auger flighting, the rate of grout injection and auger withdrawal shall be coordinated so that there is at least 115 percent of the theoretical volume for each subsequent depth increment. The volume of grout shall be monitored and recorded at intervals not exceeding 2 feet. If grout pumping is interrupted for any reason, or discontinuous grout return at the ground surface is observed, the ACP Contractor shall lower the auger at least 5 feet below the level where the interruption occurred while continuously pumping grout.

L. The technique and equipment used to initiate and maintain the grout or concrete flow shall be such that a pile of the full design cross-section is obtained from the maximum depth of boring to the final pile cut-off level. The grout or concrete shall be supplied to the pile at a rate during auger withdrawal that ensures that a continuous monolithic shaft of at least the full specified cross-section is formed and is free from soil inclusions or any grout or concrete segregation.

M. If less than the specified minimum grout factor (1.15) is placed in any 5-foot increment (at least until the grout head on the auger flighting reaches the ground surface) or grout pressure decreases, the auger shall be lowered 5 feet or to the bottom of the pile if that is less, followed by controlled auger withdrawal while maintaining grout injection.

N. If placement of grout or concrete is suspended for any reason, the pile will need to be re-drilled. The pile may be re-drilled in the same location if the grout or concrete is still fluid enough for the drill rig to penetrate. If the grout or concrete has set, the pile will need to be re-drilled in a new location.

O. Excess spoil that accumulates around the auger from the drilling process and grout injection shall be promptly cleared away.

P. Pile reinforcement shall be installed immediately upon completion of the grouting operation, and before the grout reaches its initial set; single bares may be installed through the center of the hollow steam augers so fitted prior to grouting. The reinforcing steel shall be free of soil, auger spoil, or other deleterious materials prior to insertion into the grouted shafts.

Q. The reinforcing steel shall fall freely under its own weight to the specified level within the pile. Vibration or pushing of the cage with equipment shall not be done unless permitted by the Geotechnical Engineer.

If reinforcing steel cannot be placed to the design elevation, the reinforcing steel shall be removed, and the pile shall be re-drilled and re-grouted.

R. Reinforcing steel cages shall be completely assembled and placed as a unit. Reinforcing steel shall be free of any permanent distortion, such as bars bent by improper pickup.

S. Immediately after rebar placement, secure and adequately support the reinforcing steel, and fully protect the pile head from all construction activity until the pile has sufficiently hardened.

T. Piles shall be completed the same day they are drilled and shall not be left partially completed overnight. Completely grout and protect piles prior to the termination of each day's operation.

U. Adjacent piles may be installed consecutively if the center-to-center spacing between such piles is greater than 6 pile diameters. Adjacent piles with a center-to-center spacing of less than 6 pile diameters should not be installed within 12 hours unless reviewed by the Geotechnical Engineer.

3.4 PILE HEAD FINISHING AND PROTECTION

A. The sequence of pile installation shall be such that adjacent piles show no evidence of disturbance. The load applied to the soil by the drilling equipment shall be far enough away from the pile being drilled to avoid compressing or shearing of the soil which may in turn displace or squeeze-off the grout column.

B. Upon completion of placement of the fluid grout or concrete, the ACP Contractor shall remove all excess grout or concrete and spoil from the vicinity of the top of the excavation before any reinforcement is placed.

C. If required, the ACP Contractor shall place a suitable device (sleeve or casing) of proper diameter and at least 18-inch in length to establish the pile cut-off level and to keep surface spoil from entering the grout column before it sets. Any foreign material shall then be removed from the top of the grout column by shovel or a specialty device such as a grout screen.

D. The level of grout in completed piles shall be periodically inspected for settlement. If grout settlement is observed, the pile-top should be re-established with fresh grout, provided any deleterious materials that may have accumulated on top of the settling grout are completely removed. The level of grout shall not be permitted to settle below groundwater level prior to initial set.

E. Cut off piles by methods which will not damage the reinforcing steel and/or the concrete of the pile portion left in place.

F. Acceptable tolerance in finished top of pile elevation relative to the planned elevation shall not be more than 1-inch.

G. Acceptable tolerance of top of steel reinforcement from planned top shall not be more than 1-inch.

3.5 UNACCEPTABE PILES

A. Unacceptable piles are defined as piles that do not meet the project specifications. The following items constitute construction conditions which would be considered a basis for pile rejection:

1. Piles that are tested using TIP methods and do not meet the minimum pile dimensions.

2. Piles for which the data from the automated measuring and recording equipment, other recording methods, or the records indicate that a defective pile has been installed due to an inadequate penetration rate, grout/concrete volume factors or pressures, or other pile installation parameters that do not meet the criteria established by the Specifications.

3. Piles out of position at the ground surface or not within the plumbness or batter limits.

4. Piles in which the top of pile elevation is outside the limits shown on the approved working drawings.

5. Piles in which the grout or concrete strength, and/or grout or concrete factor is less than as designed.

6. Piles in which the reinforcing steel was not inserted as designed.

7. Piles that exhibit any visual evidence of grout or concrete contamination, excessive settlement of grout/concrete, structural damage, or inadequate consolidation of grout/concrete (honeycombing).

B. Unacceptable piles shall be replaced or repaired at the ACP Contractor's expense.

PART 4. MEASURMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement and payment of Contract Item 02465.1 of furnishing the test pile, reaction piles, load frames, reaction weights, test equipment, test operations, test reporting, pile cut off and abandonment, and removal of test equipment shall be on a basis of each test performed.

B. Measurement and payment of Contract Item 02465.2 will be made for linear foot of ACP installed. The ACP length shall be measured from the pile cut off elevation to the pile tip elevation. Pile tip for payment shall be to the design tip elevation indicated on the drawings, unless field conditions required deeper installation based on the Engineer's direction or approval. The unit price includes all materials, labor, equipment, and coordination for complete installation. Preparation of submittals, quality control/quality assurance, clean up and disposal of waste grout, cleanup and disposal of soil spoils, and all other requirements of the contractor to provide completed ACPs indicated in this specification shall be included in the unit price and will not be measured separately except for the test pile work as indicated in the next section.

4.2 PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
02465.1	Augercast Pile Load Test and Reporting – 24" Diameter	Each
02465.2	Augercast Piles – 24" Diameter	Linear Foot

END OF SECTION

SECTION 02475

DRILLED MICROPILES

PART 1. GENERAL

1.1 GENERAL PROVISIONS

A. General Provisions of the Contract, including GENERAL and SUPPLEMENTARY CONDITIONS AND GENERAL REQUIREMENTS, apply to the work specified in this Section.

B. Examine all other Sections of the Specifications for requirements which affect work of this Section, whether or not such work is specifically mentioned in this Section.

C. Coordinate work with that of all other trades or contracts affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

D. Comply with applicable requirement of the following standards. Where these standard conflict with other specified requirements, the most restrictive requirements shall govern.

1. 2021 International Building Code (IBC)
2. Connecticut State Building Code Amendments to IBC 2021
3. American Concrete Institute (ACI)
4. American Society for Testing Materials (ASTM):
    a. ASTM A252 –Welded and Seamless Steel Pipe Piles
    b. API N-80 – Casing Pipe
    c. ASTM C109 – Compressive Strength of Hydraulic Cement Mortars (using 2-inch cube specimens)
    d. ASTM C150 – Portland Cement
    e. ASTM C494 – Chemical Admixtures for Concrete
    f. ASTM A615- Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
    g. ASTM A722 - Standard Specification for High-Strength Steel Bars for Prestressed Concrete
    h. Occupational Safety and Health Administration (OSHA):
    i. Regulations, 29 CFR Part 1926 - Including, but not limited to, Excavations and Excavation Support, Current Revision

1.2 DESCRIPTION OF WORK

A. The Contractor shall be responsible for designing and furnishing all work and materials for the installation of drilled micropiles. Drilled micropile work includes but is not limited to the following items:

1. Furnish and install micropiles of capacity and quantity indicated on the Project Drawings. The project includes construction of micropiles with required design axial compression loads between

62- and 92-kips compression, 18 to 50 kips tension, and lateral loads of 24 to 28 kips. The required load combinations and stationing are provided in the project drawings on Sheet S-301.

2. Work area shall be limited to the demarcated project area. The Contractor shall provide a work plan and maintain open access to the neighboring restaurant and other tenant buildings onsite. The work plan shall minimize space occupied for storage and parking.
3. Designing an appropriate drilled micropile foundation system including, but not limited to, appropriate drilling technique, pile diameter, pile length and reinforcement.
4. Providing all equipment necessary for the installation of drilled micropiles at the locations indicated on the Drawings.
5. Providing all equipment and materials for the protection of existing buildings, pedestrians, and all ancillary facilities located within the work area.
6. Installation of drilled micropiles through whatever material encountered to the required depth. The equipment shall be capable of drilling through boulders encountered in the soil and any other obstructions, at no additional cost.
7. Hauling and legal disposal of all excavated materials and excess grout from the drilled concrete micropile shaft which cannot be reused on site.
8. Providing debris shields and other equipment or materials required to contain all excavated material within the immediate work area.
9. Installation of temporary steel casing during drilling to limit ground loss at adjacent existing utilities and structures.
10. Furnishing and installation of steel reinforcing, grout, permanent casing, and centering devices as required.
11. Removal of grout overpour or other irregularities which interfere with other structural elements or utilities.
12. Drilled micropiles shall be cut-off at the elevations shown on the Contract Drawings at no additional cost.
13. Perform one static load test as specified herein.

B. The Site is located at the Stratford Water Pollution Control Facility which will remain open and active during construction of the Flood Protection System Improvement project. All construction work must be coordinated with Stratford WPCF to maintain operations. The Contractor shall not be compensated for any delays or extra costs associated with any special measures required to perform the Work of this Contract according to the Project Documents.

C. The Contractor is alerted to overhead utilities which may interfere with micropile installation along Birdseye Street, Beacon Point Road and the Stratford Animal Shelter driveway. The Contractor shall not be compensated for any delays or extra costs associated with any special measures required to perform the Work of this Contract according to the Project Documents.

1.3 SUBMITTALS

A. Provide submittals to the Geotechnical Engineer for review at least 14 days prior to commencing pile installation. Review of the submittals by the Geotechnical Engineer will not relieve the Contractor of the

responsibility to provide and install micropiles capable of supporting the design loads specified herein. Submit items of this Article in a single submittal package. Submittals shall include the following:

1. Design calculations and shop drawings for piles prepared by a Professional Engineer registered in the State of Connecticut, as evidenced by the imprint of their seal and signature on the document.
2. Use the following minimum design guidelines:
    a. The current Connecticut State Building Code.
    b. Minimum drill hole diameter of 12-inches.
    c. Minimum design capacity per pile or as noted on the plans.
    d. Pile bearing material shall be natural Outwash Deposits (sand and gravel), Glacial Till or Bedrock.
    e. Minimum factor of safety shall be 2.0 for the bond stress.
    f. For permanent steel casing used as reinforcing, increase the outer dimension of steel by 0.069 inch (1.75 mm) to allow for corrosion.
    g. Temporary and permanent casing may be the same. At a minimum, permanent casing shall be placed through the fill, organics strata, and silty sand and penetrate at least one foot into underlying Outwash Deposits (sand and gravel).
3. Cement grout design proposed for this work and strength test data for that mix by an independent testing laboratory certified by the State of Connecticut. Provide results of mortar and grout tests, and manufacturer's literature of any admixtures such as mineral fillers, fluidifiers, retarders, etc.
4. Manufacturer's literature and certification for pile steel reinforcement.
5. Description of equipment and procedures for installation of piles including method of advancing the hole through soils and boulders, method to assure the drilled hole has at least the minimum required diameter before grouting the drilled hole, the method to flush the drilled hole, and method of measuring volumes of grout to be placed for each pile and pressure grouting system details, as applicable. Also include details of centering devices for steel reinforcing.
6. Method of pressure grouting the annular space between the permanent casing and the drill hole as the temporary casing is withdrawn for the soil bond zone.
7. Means of monitoring verticality of the drill hole in the two principle perpendicular planes during drilling and details of proposed corrective measures to be implemented as necessary.
8. Submit details of proposed equipment, methods, and sequence of operation to remove and dispose of, or advance through, obstructions, which are anticipated.
9. Submit record information as specified in Section 1.8 of this specification for all micropile installations, including test piles.
10. Load test location, procedures and equipment (refer to Section 2.2 and 3.3 herein). Provide shop drawings with details of the load test setup including test micropile, reaction system layout, load cell and hydraulic jack, strain gages, and anticipated subsurface conditions at the test pile location. Provide reaction system design calculations prepared by a Professional Engineer registered in the State of Connecticut. Provide recent calibration records for the load cell and hydraulic jack to be used, prior to conducting the load test. Submit load test report as specified in Section 3.3. Drilling for production micropiles shall not begin until load test data have been reviewed by the Geotechnical Engineer.

B. Submit record information specified in Section 1.8 of this specification (except grout test results) within 24 hours of completing each pile. The results of testing of grout samples shall be submitted within 24 hours of obtaining the data.

1.4 PROJECT CONDITIONS

A. The Contractor shall protect existing structures from damage. This includes existing buildings, roadways, sidewalks, equipment, and utilities. All construction induced damage shall be repaired by the Contractor to the satisfaction of the Owner at Contractor's expense.

B. The Contractor shall visit the site to review all details of the work and working conditions, to verify dimensions in the field and to advise the Engineer and Owner of any discrepancy before performing any work.

C. The Contractor shall consult Contract Drawings and official records of existing utilities, both surface and subsurface, and their connections to be fully informed on all existing conditions and limitations as they apply to this Work and its relation to other construction Work.

D. Temporary casing will be required during drilling to prevent the loss of ground or disturbance to existing structures and utilities, and as required for lateral structural capacity. A permanent casing is required through the fill and organic soils, as a minimum, to prevent squeezing of the drill hole and assure the full cross section of the pile.

E. Contractor to excavate the upper 6 feet by hand excavated or by soft dig methods to place the temporary casing where required to protect existing utilities.

1.5 SUBSURFACE SOIL DATA

A. Review logs of borings, record of investigations, and other pertinent data for the site. After obtaining Owner's permission, take whatever additional borings or explorations deemed necessary at no expense to Owner.

B. A Geotechnical Engineering and Environmental Data Report dated February 20, 2023 was prepared for the Project by GZA GeoEnvironmental, Inc. The data included in the Geotechnical Engineering Report is for general information and is accurate only at the particular locations and time the subsurface explorations were made. It is the Contractor's responsibility to make interpretations and draw conclusions based on the character of materials to be encountered and the impact on his/her work based on his/her expert knowledge of the area and of pile installation techniques.

C. Subsurface explorations and the developed site location indicate possible below grade obstructions within the limits of the Project. Such obstructions include, but are not necessarily limited to, boulders, concrete, and construction debris. Refer to the attached boring logs for additional information. The Contractor is responsible for drilling through obstructions where they are encountered.

D. Aforementioned data is for general information and is accurate only at the particular locations and time the subsurface explorations were made. It is the Contractor's responsibility to make interpretations and draw conclusions on the character of materials encountered and the impact on this work based on their expert knowledge of the area and of pile installation techniques.

1.6 QUALITY ASSURANCE

A. Provide written statement verifying the Contractor has successfully completed at least five projects of similar size and complexity in this type of installation. Identify the design consultant and Owner for each project. Provide written documentation of the competence and experience of the person who will be in charge at the site.

B. Employ within the Contract Price, a Registered Land Surveyor or Registered Professional Engineer familiar with this type of work to:

1. Establish lines and grades.
2. Establish actual pile locations.

1.7 TOLERANCES

A. Maximum variation of any pile from the planned or indicated location at the cut-off elevation shall not exceed three inches (3") unless approved by the Owner.

B. Maximum variation of any pile from vertical is 1 horizontal to 50 vertical (1:50) ratio.

C. Cut-off elevation shall be within ½ inch of elevation shown on the plans.

D. See Section 3.4 of this specification for remedial actions for non-conforming piles.

1.8 PROJECT RECORD DOCUMENTS

A. Submit as-installed records and drawings including the following information to the Owner within one day after completing each micropile installation, including test piles. Data shall include:

1. Date and time of drilling and grouting.
2. Pile numbers, sizes, lengths, and locations of pile.
3. Sequences of installations.
4. Condition of the bottom of the drill hole.
5. Verticality information.
6. Tip elevation of each pile to nearest 0.1 ft.
7. Cut-off elevation of each pile to nearest 0.1 ft.
8. Show locations of centers of as-installed piles on a drawing in relation to design location to the nearest 0.1 ft. Indicate magnitude and direction from plan location.
9. Volume of grout used and injection pressure.
10. Reinforcing steel details, including elevation of splices to nearest 0.1 ft.
11. Grout samples taken for testing.
12. Elevation of centralizers to nearest 0.1 ft.
13. Soil profile encountered during drilling to nearest 0.5 ft.
14. Length and elevations of temporary drill casing used.
15. Length and elevations of permanent steel casing used.

B. Submit final as-installed records and drawings of each pile installed to the Owner within three (3) days after completion of the Work of this Section.

1.9 RELATED SECTIONS

A. Section 02300 “Earthwork”.

B. Section 03300 “Cast-in-place Concrete”.

PART 2. PRODUCTS

2.1 MATERIALS

A. Cement Grout

1. Cement grout shall be a mixture of Portland Cement (Type II) and clean, potable water proportioned and mixed to maintain solids in suspension without appreciable water gain and flowable to provide good bonding in the bearing stratum.

2. 28-day minimum compressive strength of 5,000 pounds per square inch (psi).

3. Admixtures shall be used in accordance with manufacturer's recommendations.

B. Reinforcing Bars

1. Minimum Grade 75 Threaded Bar, free of rust, grease, oil, dirt, or other objectionable material at the time of placement into the pile.

2. Reinforcing Steel Splice Couplings

3. Couplings shall develop at least 125 percent of the specified yield strength of the rebar in compression and tension. No lap splices shall be used.

4. Centralizers
   a. At a maximum 10-foot spacing or as required to maintain alignment of reinforcing steel in the center of the drilled pile and to provide minimum required grout cover.

2.2 LOAD TEST

A. Calibrate load cells and hydraulic jack, including complete assembly of pumps, gages, and ram to be used in the load test for this project by an approved laboratory. Perform a minimum of three calibration runs at ram extensions of one-inch, mid-range and one-inch less than full range within 2 weeks of load test.

B. Conform to ASTM D1143 for equipment type, reaction system, load instrumentation, and deflection monitoring.

C. Measure movements of pile butt using three (3) independent dial gages accurate to 0.001 inch. The Contractor shall permit dial gages to be spaced at one hundred and twenty degrees (120°) around the pile at equal distance from the center of the pile. In addition, a mirror and wire line shall be setup as a secondary measurement of pile butt movement.

D. The strain gages shall be read at each increment.

E. Provide reaction frame capable of safely supporting 125 percent of the maximum test load.

F. Strain gauges shall be Geokon vibrating wire (VW) model 4911, or equivalent. Six pairs of strain gages shall be installed at the following preliminary depths for each test pile:

1. 5 feet below grade at top of pile,
2. Bottom of existing fill/top of organic deposits,
3. Bottom of organic deposit/top of natural outwash deposit,
4. 10 feet below top of Outwash Deposit,
5. 20 feet below top of Outwash Deposits, and
6. 5 feet above the bottom of pile.

PART 3. EXECUTION

3.1 PREPARATION FOR DRILLING

A. The Contractor shall verify that site conditions will allow for access of proposed equipment and will support equipment for pile installation. Work area will be limited to the existing construction limits established by the general contractor. Parking and staging areas will be minimized and must be approved by the Owner based on submittal from the micropile contractor. The micropile contractor will sequence the micropile work, staging, storage, and clean up to provide uninterrupted public access to existing businesses and buildings onsite.

B. The presence of utilities, existing structures and other obstructions, including but not limited to, boulders in the soil layers above and in the gravely sand and construction debris, will require strict adherence to the planned drilling locations shown on the Drawings. Any interferences encountered in the drilling of piles shall be brought to the attention of the Engineer and Owner.

C. Utilize the same equipment for all production and test piles.

D. Mark or stake all pile locations and provide ground surface elevations.

3.2 INSTALLATION

A. Drilled pile installation shall generally consist of the following method:

1. Drill holes to required depth using rotary wash methods. Do not use compressed air.
    a. Provide temporary steel casing during drilling. Casing shall be continuously joined and shall have the strength and rigidity to maintain the required excavation dimensions. Driving of casing will not be allowed. Drilling shall be performed such that the cuttings and wash fluid return through the inside of the casing. External flush will not be allowed. The method of drilling used shall prevent the loss of ground due to erosion, jetting, or blow-in at the bottom of the casing. No air drilling will be allowed. No open hole drilling will be allowed.
    b. Maintain and verify that hole is open and clear for installation of steel reinforcement and cement grout.
    c. Minimum hole diameter will be as determined by outside diameter of casing unless the Contractor can verify that a larger diameter is developed by installation techniques.
    d. Legally dispose of all materials removed from holes not reused on site in accordance with the project specifications.

2. Flush holes with water or slurry prior to installing reinforcing steel or cement grout until all contaminated water and cuttings are removed and a clean return is observed. Use an internal circulation method which will not alter soil stability or aggravate existing environmental conditions.

3. Verify drill hole has not collapsed and has the specified minimum diameter along its entire length.

4. Place cement grout by tremie method in accordance with PTI "Recommended Practice for Grouting of Post-Tensioned and Prestressed Concrete" as applicable. Place tremie pipe to bottom of pile. Maintain tremie pipe at least five feet (5') below grout surface until casing is filled with grout to cut-off elevation.

5. Install reinforcing steel with centralizers to full depth of pile at time of grouting. Provide reinforcing steel splices, if required. Centralizers shall be placed along the entire length of pile no greater than 10 feet apart.

6. Install permanent casing to required depth prior to removing temporary drill casing unless casing used during drilling is left in place to serve as permanent casing.

7. Where temporary casing is utilized by the drillers methods and where casing is removed for grout to soil bond, the following procedures shall be used for casing extraction:
   a. As the grout column drops in the hole during withdrawal of the temporary casing, pump grout under pressure through the casing to fill any space between the temporary casing and the drill hole with grout. Also, verify that the annular space between the permanent casing and drill hole is filled with grout.
   b. Maintain pressure on the grout and a positive flow of grout into the pile hole after withdrawing each length of temporary casing.
   c. Check grout level before, during and after withdrawing casing to confirm that separation of grout has not occurred.

8. Grouting of a pile shall be completed on the same day that the pile is drilled. Obtain grout samples from the end of the tremie grout line for each pile. Grout specimens will be prepared and tested by the Owner or their representative, in accordance with ASTM C109, at no cost to the Contractor.

9. At a minimum, the Contractor shall be required to use a Baroid Mud Balance (per API RP-13B-1) to check the specific gravity of the mixed grout prior to placement into each drilled micropile.

10. Contractor shall determine micropile installation sequence prior to the start of work. Sequence installation such that no new pile is drilled within a minimum of 10 feet of an adjacent pile without allowing adjacent pile grout to set for at least 12 hours. If interaction is observed between piles during grouting, stop work and allow adjacent micropile grout to cure for at least 48 hours.

11. Place at least 100 percent of the theoretical volume of grout based on the outside diameter of the casing, if temporary casing is not left in place to serve as permanent casing. Notify the Geotechnical Engineer immediately if the actual grout take is less than the theoretical volume of grout.

B. Do not allow vibration or excessive wheel loads to influence piles during installation and construction. Keep excavation stable at all times.

1. Where obstructions make it impossible to install certain piles at locations shown on the Contract Drawings and/or to the proper depths, resort to all usual methods for pile installation including core drilling, pilot drilling, alternative cutting heads or bits, and other suitable methods, though compressed air drilling and methods not allowed by this specification shall not be allowed. If the

Contractor is unable to complete the proper installation of any pile, after resorting to such methods, an additional pile or piles may be required to be installed or that other remedial action be taken, for which the Contractor will be paid in accordance with the unit prices established in this contract.

2. Fill with grout any pile abandoned because of obstructions encountered before reaching the anticipated depth at no additional cost to the Owner.

3.3 PILE LOAD TEST

A. Perform a tension load test in accordance with applicable ASTM standards, as specified herein, and as required by the Geotechnical Engineer or Owner. The maximum test load shall be 182 kips, twice the maximum design load of 91 kips. Strain gauges shall be installed in pairs at the depths indicated.

B. Use the same size and type of test pile as specified for other micropiles used for this project and installed in the same manner. Contractor is to increase the test load and provide strain gauges to ensure the test load reaches the design bond zone.

C. Do not begin load test until grout reaches the required design compressive strength. Allow a minimum of 3 days for the grout to cure. The Owner or their representative will sample and test grout during test pile installation as specified herein.

D. Provide sufficient protection from the elements (rain, wind, etc.) and heating during the load test, as required, which could affect the test results.

E. Apply test loads and record load-deformation data in accordance with ASTM D1143 – Procedure A: Quick Test. In no case shall a load be changed if the rate of settlement is not decreasing with time.

F. The allowable design capacity will be taken as the lesser of the following:

1. 50 percent of the maximum applied test load; or

2. 50 percent of the failure load. Failure is defined as the test load where the slope of the load versus head settlement curve first exceeds 0.025 in/kip.

G. Piles will be approved for the design load provided that the load-settlement curves show no signs of failure, and provided that the net settlement of the top of the test pile, after removal of the load at the completion of the test, does not exceed 0.5 inches.

H. Test piles will be sacrificial and not used in the completed structure. Cut off and abandon test piles below grade following load tests.

I. If test piles do not conform to the specified requirements, provide additional test piles and testing, as directed by the Owner, at no additional cost to the Owner.

J. Submit load test report to Geotechnical Engineer for review and comment within 2 days following completion of each test. Drilling for micropiles shall not begin until load test report has been reviewed by the Geotechnical Engineer. Load test reports shall include the following:

1. All test pile record information specified in Article 1.8 of this Section, including a scale drawing of test piles showing all relevant construction details and subsurface conditions encountered during installation.

2. Tabular and graphical summary of the specified load-deformation data.

3. Brief memorandum summarizing testing procedure, test results, and recommended allowable design load.

3.4 NON-CONFORMING PILES

A. Non-conformance piles include piles that are installed out of tolerances, as specified in Section 1.7 of this Section, are damaged, the volume of grout placed is less than the theoretical volume of the hole, the grout tests do not indicate the specified strength has been achieved or the pile is not installed to specified bearing stratum. To mitigate and/or remedy non-conforming piles, the Contractor may be required to provide additional piles or supplement piles to meet specified requirements at no additional cost to the Owner.

PART 4. MEASURMENT AND PAYMENT

4.1 MEASUREMENT AND PAYMENT

A. Payment for micropile installation shall be measured on a linear foot basis of pile installed below cutoff elevation, excluding unsatisfactory piles. Unit prices shall be the full compensation for all Contractor's support, labor, materials and incidentals necessary to supply and install the piles and performing all other work specified in this Section which is not included in other items, in accordance with these specifications.

B. Drilled micropile load test will be paid at the Contract Lump Sum Price which shall be full compensation for all equipment, labor, and materials required for the successful load test subject to review and comment by the Geotechnical Engineer. Equipment and materials shall include, but not be limited to, load cells, hydraulic jack, complete assembly of pumps, gages, and ram, reaction system, load instrumentation, and deflection monitoring equipment. No payment will be made for load tests that indicate that the pile does not achieve the required capacity.

4.2 PAYMENT ITEMS

Payment shall be at the bid unit price of the following items:

ITEM NO.	PAYMENT ITEM	UNIT
02475.1	Drilled Micropile Load Test and Reporting – 12.75” Diameter	EACH
02475.2	Drilled Micropile – 12.75” Diameter	LINEAR FOOT

END OF SECTION

SECTION 02510

BITUMINOUS CONCRETE PAVEMENT

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, equipment, materials, tools, and accessories to complete the Work of this Section. The Work of this Section includes but is not limited to:

1. Preparation of pavement subgrades, installation of base course, and preparation of existing pavements to receive new bituminous concrete pavement and curbing.
2. Provision and installation of new bituminous concrete pavement and curb where required and as indicated on the Contract Drawings.
3. Restoration of existing bituminous concrete pavement and curb disturbed by the Work during construction.

B. The terms “Hot Mix Asphalt,” “HMA,” “Bituminous,” or “Bituminous Concrete” in reference to pavement and curb indicated within these Specifications, the Contract Drawings, and other Contract Documents shall refer to the Work of this Section.

1.2 REFERENCES

A. The following references and standards, latest editions, shall apply to the Work of this Section:

1. American Association of State Highway and Transportation Officials (AASHTO).
2. American Society for Testing and Materials (ASTM).
3. State of Connecticut Department of Transportation (CTDOT) Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction - Form 819 (2024)

1.3 RELATED SECTIONS

01010	SUMMARY OF WORK
01300	SUBMITTALS
01560	TEMPORARY EROSION AND SEDIMENT CONTROLS
01740	SITE RESTORATION
01900	MOBILIZATION / DEMOBILIZATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02110	CLEARING, GRUBBING, AND STRIPPING
02300	EARTHWORK
03300	CAST-IN-PLACE CONCRETE
11287	DEPLOYABLE FLOOD BARRIER SYSTEMS

1.4 SUBMITTALS AND SAMPLES

A. The Contractor shall provide job mix formula for all bituminous concrete specified in this Section, listing quantities and pertinent ingredient properties for review by the Engineer. Do not order materials until

Engineer's approval of mix formula has been obtained. Delivered materials shall closely match the approved samples.

B. Contractor shall submit tonnage receipts for all delivered and placed materials.

1.5 QUALITY ASSURANCE

A. Unless otherwise specified, work and materials for construction of the bituminous concrete pavement and curb shall conform to the applicable portions of the following:

1. CTDOT Section 4.06 Bituminous Concrete.
2. CTDOT Section 8.15 Bituminous Concrete Curbing.
3. CTDOT Section M.04 Bituminous Concrete Materials
4. Section 01740 – Site Restoration
5. Section 02300 – Earthwork.

B. Paving work, base course installation, top coarse installation and the like, shall be performed only after excavation and construction work which might damage them has been completed. Damage caused during construction shall be repaired before acceptance.

C. Pavement subbase shall not be placed on a muddy or frozen subgrade. Pavement courses shall not be placed on frozen or contaminated base course or binder course.

D. Existing pavement if damaged during the course of this project shall be repaired or replaced as specified, at no additional cost to the Owner.

1.6 TESTING AND INSPECTION

A. The Owner reserves the right to retain an independent testing laboratory to perform inspection and testing of paving and associated work. If required, the Contractor shall accommodate and assist such testing and inspections.

PART 2. PRODUCTS

2.1 PAVEMENT BASE COURSE

A. Pavement base course shall be processed aggregate in accordance with Section 02300 – Earthwork.

2.2 TACK COAT

A. Tack coat shall consist of asphalt emulsion, Type RS-1 or RS-1h conforming to CTDOT M.04.

2.3 BITUMINOUS CONCRETE

A. Bituminous concrete shall be a standard plant-mixed, hot-laid paving material for road work, consisting of clean, crushed rock aggregate, mineral filler, and asphalt conforming to CTDOT M.04.

B. Bituminous Concrete Pavement shall consist of at least two (2) courses (lifts) of bituminous concrete mix conforming to Mix Type S0.5, Traffic Level 2 per CTDOT M.04.

1. Minimum finished bituminous concrete pavement thickness after compaction shall match existing and adjacent pavement sections, or as indicated on the Contract Drawings if greater, but not less than 3.5 inches.
    a. Maximum thickness of binder course(s): 3 inches
    b. Minimum thickness of top/wearing course: 1.5 inches.

C. Bituminous Concrete Lip Curb mix shall be in accordance with CTDOT M.04 (Table M.04.02.-1)

PART 3. EXECUTION

3.1 PREPARATION

A. Removal of Existing Pavement and Curb:

1. Demolition and removal of existing bituminous concrete pavement and curb shall be performed in advance of new pavement and curb installation, as required herein, as indicated on the Contract Drawings and in accordance with Section 02065 – Demolition, Removal, and Disposal.
2. The Contractor shall be responsible for the protection existing bituminous concrete pavement and curb beyond the limits of demolition and removal indicated on the Contract Drawings. Existing bituminous concrete pavement that is damaged beyond the limits of demolition and removal indicated on the Contract Drawings shall be removed and replaced, as required, by the Contractor at no additional cost to the Owner.
3. Existing pavement and curb shall be saw-cut to provide a neat, vertical face at the limit of removal at the time new pavement is installed. Pavement edges that are damaged for any reason at the time of proposed pavement installation shall be saw-cut again, and repeated as necessary, to provide the required existing edge condition in accordance with this section, as indicated on the Contract Drawings, or as directed by the Engineer, at no additional cost to the Owner.
4. Existing bituminous pavement and curb that is demolished or disturbed by the work shall become the property of the Contractor and shall be removed from the Site and disposed of off-Site in accordance with Section 02065 – Demolition, Removal, and Disposal.

B. Subgrade:

1. Existing subgrade material that will not readily compact as required shall be removed and replaced with satisfactory materials. Additional materials needed to bring subgrade to required line and grade and to replace unsuitable material removed shall be material specified, delivered, installed, and paid for under Section 02300 - Earthwork.
2. Subgrade of areas to be paved shall be recompacted as required to bring top 8 inches of material immediately below gravel base course to a compaction of at least 95 percent of maximum density, as determined by ASTM D1557, Method D. Subgrade compaction shall extend for a distance of at least 12 inches beyond pavement edge.
3. Excavation required in pavement subgrade shall be completed before fine grading and final compaction of subgrade are performed. Where excavation must be performed in completed subgrade or processed aggregate base course subsequent backfill and compaction shall be performed as directed by the Engineer as specified under the work of Section 02300 - EARTHWORK, of this Specification. Completed subgrade after filling such areas shall be properly graded.

4. Areas being graded or compacted shall be kept shaped and drained during construction. Ruts greater than or equal to 2 inches deep in subgrade, shall be graded out, reshaped as required, and recompacted before placing pavement.

5. Materials shall not be stored or stockpiled on subgrade.

6. Disposal of debris and other material excavated and/or stripped shall be in accordance with Section 02065 – Demolition, Removal, and Disposal; Section 02300 – Earthwork; and Section 02315 Soil Management Plan. Material shall be legally disposed of off-site.

7. Prepared subgrade will be inspected by the Engineer. Subgrade will be approved by the Engineer before installation of paving base course.

C. Processed Aggregate Base Course:

1. Place and compact processed aggregate base course material over prepared pavement subgrade in accordance with Section 02300 – Earthwork.

2. The overall required thickness of processed aggregate base course shall be the greater of:

a. The total combined thickness of pavement and basecourse (20 inches) minus the thickness of bituminous concrete pavement.

b. A minimum of 12 inches thick.

3.2 BITUMINOUS PAVING AND CURBING

A. All proposed bituminous concrete pavement and curb shall be installed as required, as indicated on the Contract Drawings, and in accordance with this Section.

B. All existing bituminous concrete pavement and curb that is damaged beyond the limits of demolition and removal, or new pavement and curb indicated on the Contract Drawings shall be removed and replaced in-kind, as required, to restore the existing pavement and curb to match pre-construction conditions by the Contractor at no additional cost to the Owner.

C. Bituminous paving and curb mixture, equipment, methods of mixing and placing, and precautions to be observed as to weather, condition of base, and related requirements shall conform to CTDOT Sections 4.06 Bituminous Concrete, 8.15 Bituminous Concrete Curbing, and M.04 Bituminous Concrete Materials, as modified herein, and indicated on the Contract Drawings.

D. Bituminous pavement binder and wearing (top) surface courses shall each be applied individually, in single lifts of full thickness as indicated herein and on the Contract Drawings.

E. Bituminous concrete curbing shall be placed and compacted by a curbing machine. Placement and finishing of bituminous concrete curbing by hand methods may be permitted only where machine work is impractical, such as when joining to existing curbing to remain, around drainage structures and grates, or when otherwise permitted by the Engineer. The required curb section geometry shall be as indicated on the Contract Drawings.

F. Application of Tack Coat:

1. Areas to receive tack coat prior to paving operations shall be swept clean of loose materials, dirt, or other extraneous materials.

2. Application of tack coat shall be at a rate of 0.10 gallon per square yard.

3. The following areas shall be treated with application of tack coat:

   a. All cut edges of existing bituminous concrete pavement adjacent to placement of new paving.

   b. Against all vertical faces of abutting structures.

   c. As a tack coat for all bituminous concrete pavement binder or base courses that do not have the top course installed within a 24-hr period after placement of the underlying lift of bituminous concrete pavement.

   d. Horizontally below the full width of bituminous curbing, where it is underlain by bituminous or cement concrete.

G. No mix shall be placed on wet or damp surfaces. No mix shall be placed when ambient temperatures are 40°F (4.5°C) and falling.

H. Existing bituminous pavement which will be adjacent to new paving shall be saw cut to a clean, neat, and vertical edge.

I. Raise all castings located in the areas of new bituminous concrete pavement to finished grade prior to installation of the top/wearing course so as to avoid subsequent patching.

J. The Engineer may require the Contractor to remove and replace at his own expense any defective mix not conforming to the specified job mix formula.

K. If, at any time before the final acceptance of the work, any soft, imperfect places or spots shall develop in the surface, all such places shall be removed and replaced with new materials and then compacted until the edges at which the new work connects with the old become invisible.

L. Adjacent paving, curbing, and other features shall be protected from stain and damage during entire pavement and curbing installation operation. Damaged and stained elements shall be replaced or repaired to equal their original condition.

M. Deliveries shall be timed to permit spreading and rolling all material during daylight hours, unless artificial light, satisfactory to Engineer, is provided. Loads which have been wet by rain or otherwise will not be accepted. Hauling over freshly laid or rolled material will not be permitted.

N. Spreading and Finishing:

1. The equipment for spreading and finishing shall be mechanical, self-powered paving and curbing machines, capable of spreading and finishing the mixture true to lines, grade, width and crown by means of fully automated controls for both longitudinal and transverse slope.

2. If, during construction, it is found that the spreading and finishing equipment in use leaves tracks or indented areas, or produces other permanent blemishes in the pavement or curbing, which are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued and other satisfactory spreading and finishing equipment shall be provided by the Contractor.

3. The mixtures shall be placed and compacted only at such times as to permit the proper inspection and checking by the Engineer.

4. The mixtures shall be placed only upon approved surfaces that are clean from foreign materials and dry; and when weather conditions are suitable.

5. The contact surfaces of existing pavement, curbing, manholes, catch basins or other appurtenant structures in pavement shall be painted thoroughly with a thin uniform coating of tack coat material just before any mixture is placed against them. This requirement shall be included as work incidental to paving operations.

6. Machine Spreading: All mixtures shall be deposited in an approved mechanical spreader and immediately spread thereby, and then struck off in a uniform layer to the full width required and of such depth that each course, when compacted, shall have the required thickness and shall conform to the grade and cross section contour specified.

7. Hand Spreading: Spreading by hand methods will be permitted only for particular locations in the work which because of irregularity, inaccessibility or other unavoidable obstacles do not allow mechanical spreading and finishing.

O. Compaction:

1. Placing and compaction of bituminous concrete mixtures shall be as nearly continuous as possible. After the paving mixture has been properly spread, compaction shall be obtained by the use of power rollers of approved design and weight per inch of roller. The rollers shall be steel wheeled supplemented with pneumatic-tired rollers where required.

2. Rolling shall begin as soon after placing as mixture will bear the operation without undue displacement. Delays in rolling freshly spread mixture will not be permitted. Rolling shall proceed longitudinally, starting at edge of newly placed material and proceeding toward previously rolled areas. Rolling overlap on successive strips shall be greater than or equal to 1/2 width of roller rear wheel. Alternate trips of roller shall be of slightly different lengths. Corrections required in surface shall be made by removing or adding materials before rolling is completed. Skin patching of areas where rolling has been completed will not be permitted. Course shall be subjected to diagonal rolling, crossing lines of the first rolling while mixture is hot and in compactable condition. Displacement of mixture or other fault shall be corrected at once by use of rakes and application of fresh mixture or removal of mixture, as required. Rolling of each course shall be continued until roller marks are eliminated. Roller shall pass over unprotected edge of course only when paving is to be discontinued for sufficient time to permit mixture to become cold.

3. In places not accessible to rollers, mixture shall be thoroughly compacted with hand tampers. Hand tampers shall weigh at least 50 pounds and shall have a tamping face less than or equal to 100 square inches. Mechanical tampers capable of equal compaction will be acceptable in areas in which they can be employed effectively. The surface of the mixture after hand or mechanical tamping compaction shall be smooth and true to the established line and grade.

4. The densities of the completed pavement shall be not less than 95 percent of the density obtained from laboratory compaction of a mixture composed of the same materials in like proportions.

P. Portions of pavement courses which become mixed with foreign material or are in any way defective shall be removed, replaced with fresh mixture, and compacted to density of surrounding areas. Bituminous material spilled outside lines of finished pavement shall be immediately and completely removed. Such material shall not be employed in the work.

Q. Joints shall present same texture, density, and smoothness as other sections of the course. Continuous bond shall be obtained between portions of existing and new pavements and between successive

placements of new pavement. New material at joints shall be thick enough to allow for compaction when rolling. Compaction of pavement, base, and subgrade at joints shall be such that there is no yielding of new pavement relative to existing pavement when subjected to traffic.

R. Contact surfaces of previously constructed pavement (if greater than or equal to two days since binder placed), manholes, and similar structures shall be thoroughly cleaned and painted with a thin uniform coating of bitumen (tack coat) immediately before fresh mixture is placed. Tack coat shall be applied at rate which will leave bituminous residue of 5 to 7 gallons/100 square yards after evaporation of vehicle. Base surface shall be dry and clean when tack coat is applied. Bituminous paving material shall not be placed until vehicle has completely evaporated from tack coat. Adjoining new paving shall be placed before tack coat has dried or dusted over.

S. Earth or other approved material shall be placed along pavement edges in such quantity as will compact to thickness of course being constructed, allowing at least 12 inches of shoulder width to be rolled and compacted simultaneously with rolling and compacting surface. Pavement edge shall be trimmed neatly to line before placing earth or other approved material along edge.

T. Variations in pitch of finished surface shall be less than or equal to the following tolerances when tested with a 10-foot straightedge, applied both parallel to and at right angles to centerline of paved area.

1. For roadway and parking pavement surface course - 1/4 inch in 10 feet.

2. At joints with existing or proposed pavement and structures (i.e., transitions to reinforced concrete pile caps at the deployable flood gates, manhole covers, etc.), and at other locations where an essentially flush transition is required, pavement elevation tolerance shall not exceed 0.01 feet.

3. At other areas pavement elevation tolerance shall not exceed + 0.05 feet.

U. No vehicular traffic of any kind shall be allowed to pass over the newly finished surface until it has had time to set. Seventy-two hours will be considered sufficient time for the pavement to set in most cases, but this period may be extended by the Engineer as required by weather or other reasons. Under all circumstances, damage to the pavement caused by the Contractor's or public vehicles driving over the pavement before the pavement has fully cured shall be repaired as specified under this Section at no additional cost to the Owner.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Measurement and payment for Contract Item 02510.1 BITUMINOUS CONCRETE PAVEMENT – REMOVAL shall be made at the contract unit price per square yard of existing bituminous pavement demolished, removed, and disposed of off-Site to the limits indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; excavation; removal; off-Site disposal; protection; and all other incidental work necessary to complete the work under this item, as shown on the Drawings, and as herein specified.

B. Measurement and payment for Contract Item 02510.2 BITUMINOUS CONCRETE CURB – REMOVAL shall be made at the contract unit price per linear foot of existing bituminous concrete curb demolished, removed, and disposed of off-Site to the limits indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling;

storage; excavation; removal; off-Site disposal; protection; and all other incidental work necessary to complete the work under this item, as shown on the Drawings, and as herein specified.

C. Measurement and payment for Contract Item 02510.3 BITUMINOUS CONCRETE PAVEMENT shall be made at the contract unit price per square yard of new bituminous pavement installed and complete to the lines and grades indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; excavation; subgrade preparation; placement of bituminous base and wearing courses; tack coat; compaction; finishing; and all other incidental work necessary to complete the work under this item, as shown on the Drawings, and as herein specified.

D. Measurement and payment for Contract Item 02510.4 BITUMINOUS CONCRETE CURB shall be made at the contract unit price per linear foot of new bituminous concrete lip curbing installed and complete to the lines and grades indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; excavation; subgrade preparation; placement of bituminous curb; tack coat; compaction; finishing; and all other incidental work necessary to complete the work under this item, as shown on the Drawings, and as herein specified.

E. There shall be no separate measurement and payment under this section for protection, demolition, removal, off-Site disposal, and replacement or restoration of existing pavement and curbing to remain or beyond the limit of existing pavement and curb removal as indicated on the Contract Drawings. The costs of such work shall be considered incidental to the Work of the Contract and included in the price of the Contract Items.

F. There shall be no separate measurement and payment under this section for processed aggregate base course. Include all costs for the provision and installation of processed aggregate base course under the corresponding payment items for Section 02300 – Earthwork.

4.2 PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
02510.1	BITUMINOUS CONCRETE PAVEMENT – REMOVAL	SQUARE YARD
02510.2	BITUMINOUS CONCRETE CURB – REMOVAL	LINEAR FOOT
02510.3	BITUMINOUS CONCRETE PAVEMENT	SQUARE YARD
02510.4	BITUMINOUS CONCRETE CURB	LINEAR FOOT

END OF SECTION

SECTION 02633

INLINE CHECK VALVES

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, equipment, materials, tools, and accessories to complete the Work of this Section. The Work of this Section includes but is not limited to:

1. Provision and installation of Inline Check Valves within existing stormwater drainage systems as indicated on the Contract Drawings.

1.2 RELATED SECTIONS

01010	SUMMARY OF WORK
01050	FIELD ENGINEERING
01060	REGULATORY REQUIREMENTS
01100	SPECIAL PROVISIONS
01300	SUBMITTALS
01560	TEMPORARY EROSION AND SEDIMENT CONTROLS
01566	SUBSURFACE, HYDRAULIC, AND HYDROLIGIC DATA
01740	SITE RESTORATION
01900	MOBILIZATION / DEMOBILIZATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02760	PIPELINE ABANDONMENT
03300	CAST-IN-PLACE CONCRETE

1.3 SUBMITTALS

A. Submit inline check valve manufacturer’s product information and installation and maintenance instructions for review prior to ordering.

B. Submit proposed procedures, materials, and equipment to be used for the installation of inline check valves.

C. Submit a shop drawing or sketch of the proposed inline check valve installation. The shop drawing or sketch shall indicate the size, orientation, and installation methods of the check valve, dimensions and type of pipe the check valve will be installed within, the invert of the discharge pipe to contain the inline check valve (at the face of the nearest structure), the sump and rim elevation of the drain structure nearest to the check valve installation, and any other pertinent details regarding the proposed Work.

PART 2. PRODUCTS

A. Provide and install all products in accordance with the inline check valve manufacturer’s instructions.

B. Metal components shall be type 316 stainless steel, or other corrosion resistant steel subject to approval by the Engineer.

C. Inline check valves shall be specifically designed by the manufacturer to fit directly inside the existing drain pipe with or without an external flange, as suitable for the detail, and existing conditions of each proposed installation. Inline check valves shall have entirely passive operation that is self-draining during typical flow scenarios and self-sealing when backflows are experienced. Suitable products such as the following, or approved equal:

1. Checkmate Ultraflex® Inline Check Valve manufactured by Red Valve Company, Inc. of Pittsburgh, PA; 412-279-0044.

2. Proflex™ 790 Low Headloss In-Line Check Valve manufactured by Proco Products, Inc. of Stockton, CA; 800-344-3246.

D. Accessories and other related products, such as gaskets and seals, shall be in accordance with the manufacturer's recommendations.

E. Cementitious mortar or non-shrink grout shall be in accordance with Section 03300 – Cast-in-Place Concrete.

PART 3. EXECUTION

3.1 PREPARATION

A. Prior to ordering the check valve from the manufacturer, inspect and field verify all existing conditions that affect the installation of the check valve. The Contractor shall field verify and document the receiving pipe invert elevation, condition of the existing drainage structure nearest to the proposed check valve, and pipe characteristics including but not limited diameter and type. Provide any additional information as required by the inline check valve manufacturer.

3.2 INLINE CHECK VALVE INSTALLATION

A. Deliver, handle, and install the inline check valve in accordance with manufacturer's instructions, as required herein and per related sections, and as indicated on the Contract Drawings.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Measurement and payment for Contract Item 02633.1 INLINE CHECK VALVES shall be made at the contract unit price per each of new inline check valves installed and complete to the locations and conditions indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; shop drawings and product selection; gaskets and seals; fasteners; cementitious mortar and non-shrink grout; preparation and installation of the new in line check valves; and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

4.2 PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
02633.1	INLINE CHECK VALVES	EACH

END OF SECTION

SECTION 02660

DUCTILE IRON PIPE AND FITTINGS

PART 1. GENERAL

1.1 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals required to remove, replace, install, clean, and test ductile-iron pipe and fittings for the limited replacement of the Site's existing water service as indicated on the Contract Drawings and specified herein. The completed work will provide an equivalent or better level of service than the existing piping system.

B. Pipe fitting notation used in the Contract Documents is for the Contractor's convenience and does not relieve him/her from installing and jointing different fittings or additional items required to achieve a complete piping system.

C. Coordinate the work with the Owner and utility company as required. Service interruptions shall be made only with the prior approval of the Owner.

D. Maintain continuous water service to the Site throughout construction as required, including by means of suitable bypass, if necessary.

E. For joints in buried exterior pipelines, provide mechanical-joint (restrained), as required.

F. Perform associated demolition in accordance with Section 02110.

G. Perform associated earthwork in accordance with Section 02300.

H. Provide and install required valves and appurtenances in accordance with Section 02665.

1.2 RELATED SECTIONS

01010	SUMMARY OF WORK
01050	FIELD ENGINEERING
01060	REGULATORY REQUIREMENTS
01100	SPECIAL PROVISIONS
01200	PROJECT COORDINATION AND MEETINGS
01300	SUBMITTALS
01500	TEMPORARY FACILITIES AND CONTROLS
01560	TEMPORARY EROSION AND SEDIMENT CONTROLS
01740	SITE RESTORATION
01900	MOBILIZATION / DEMOBILIZATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02300	EARTHWORK
02665	VALVES AND APPURTENANCES
02760	PIPELINE ABANDONMENT

1.3 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM)

ASTM A242	Standard Specification for High-Strength Low-Alloy Steel
ASTM A307	Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
ASTM A674	Standard Practice for Polyethylene Encasement for Ductile Iron Pipe for Water or Other Liquids
ASTM A746	Standard Specification for Ductile Iron Gravity Sewer Pipe
ASTM C150	Standard Specification for Portland Cement

B. American Water Works Association (AWWA)

AWWA C104	Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C105	Polyethylene Encasement for Ductile-Iron Pipe Systems
AWWA C110	Ductile-Iron and Gray-Iron Fittings, 3-in through 48-in (75mm through 1219mm) for Water
AWWA C111	Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
AWWA C150	Thickness Design of Ductile-Iron Pipe
AWWA C151	Ductile-Iron Pipe, Centrifugally Cast, for Water
AWWA C115	Flanged Ductile Iron Pipe With Ductile Iron or Grey Iron Threaded Flanges
AWWA C153	Ductile-Iron Compact Fittings, 3-in through 24-in and 54-in through 64-in, for Water
AWWA C550	Protective Interior Coatings for Valves and Hydrants
AWWA C600	Installation of Ductile-Iron Water Mains and Their Appurtenances
AWWA C606	Grooved and Shouldered Joints
AWWA C651	Disinfecting Water Mains
AWWA M41	Ductile Iron Pipe and Fittings Manual of Water Supply Practices

C. National Sanitation Foundation (NSF)

1. NSF 61 -Drinking Water System Components Health Effects.

D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.4 QUALITY ASSURANCE

A. The Owner reserves right to inspect and test by independent service at manufacturer's plant or elsewhere at Owner’s expense.

B. Visually inspect and hammer test before installation.

C. It is a requirement of these Contract Documents to have all of the ductile iron pipe under this section designed and supplied by a single manufacturer rather than have selection and supply of these items by a number of different manufacturers. Similarly, it is a requirement of these Contract Documents to have all of the ductile iron fittings under this section designed and supplied by a single manufacturer rather than have selection and supply of these items by a number of different manufacturers. All connections between the pipe and fittings shall be compatible.

D. Each length of ductile iron pipe supplied for the project shall be hydrostatically tested at the point of manufacture to 500 pounds per square inch (psi) for a duration of 10 seconds per AWWA C15 1. Testing may be performed prior to machining bell and spigot. Failure of ductile iron pipe shall be defined as any

leak or rupture of the pipe wall. Certified test results shall be furnished in duplicate to the Owner prior to time of shipment.

E. All ductile-iron pipe and fittings to be installed under this project shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured. Furnish in duplicate to the Owner sworn certificates of such tests and their results at least 5 calendar days prior to the shipment of the goods.

F. Inspection of the pipe and fittings may also be made by the Owner after delivery. The pipe is subject to rejection at any time on account of failure to meet any of the Specification requirements even though pipe may have been accepted as satisfactory at the place of manufacture. Pipe rejected after delivery (including defects from manufacturing) shall immediately be removed from the job at the Contractor's expense.

G. All pipe and fittings to be installed under this Contract may be inspected at the plant for compliance with this Section by an independent testing laboratory selected by the Owner at the Owner's expense.

H. A manufacturer's representative shall be made available to the Owner and Engineer during the manufacturing furnishing, transporting, and unloading of the pipe during installation and testing of the pipe to assist in insuring that the pipe is properly fabricated, transported, unloaded, stored in the field, joined, and tested. Manufacturer's responsibilities relate only to the proper care and treatment of the pipe during these procedures and not the techniques or procedures used during installation and testing.

1. The designated factory representative shall be made available at any time the Owner may request. The field or site representative shall be made available a minimum of 10 working days (time on site) during the project when requested by the Owner.

2. The cost for the services of the factory representative, including expenses, shall be considered incidental and at no additional cost to the Owner.

I. The manufacturer shall meet the following criteria and furnish the necessary project information, which demonstrates the required experience:

1. Experience that includes successful fabrication (followed by installation, acceptance and service) to AWWA C151 standards of at least 50,000 lineal feet of the largest specified diameter or larger ductile iron pipe with similar linings/coatings within the past 5 years.

2. Experience shall include the successful fabrication of at least 50-fittings in compliance with AWWA C110 or C153 of the largest specified diameter or larger with similar linings/coatings within the past 5 years.

3. Experience that includes the successful fabrication (followed by installation, acceptance and service) of at least 10,000 lineal feet of the largest specified diameter or larger push-on style, boltless restrained joint for ductile iron pipe within the last 5 years.

J. All pipe and fittings shall be marked in accordance with all applicable AWWA standards. Legibly and permanently mark all pipe, fittings, specials and appurtenances to be consistent with the laying schedule and marking drawings (if required) with the following information:

1. Manufacturer, date.

2. Size, type, class, or wall thickness.

3. AWWA Standard(s) produced to.

4. Each pipe shall be identified with sequential numbering consistent with the laying schedule and marking drawings and each marked pipe shall appear on the marking drawings in the identified location for installation.

5. Special fittings, bends, and appurtenances requiring specific orientation shall be appropriately marked with the words "TOP" in the correct position and in a consistent location.

1.5 DESCRIPTION OF SYSTEMS

A. Pipe shall be made in the United States. Pipe and fittings shall be as supplied by the U.S. Pipe and Foundry, Griffin Pipe Products, all pipe divisions of the McWane Company or an approved equal who is a member of the Ductile Iron Pipe Research Association (DIPRA). All ductile iron pipe shall be supplied by a single manufacturer and all ductile iron fittings shall be supplied by a single manufacturer. The fittings supplier shall certify in writing that their fittings are compatible with the supplied brand of pipe.

B. New pipe is to be installed to replace existing water service pipe in those locations shown on the Drawings, within the proposed limits of disturbance.

C. The Contractor is responsible for locating the replacement pipe such that it does not conflict with other aspects of the proposed construction including but not limited to earthwork, pile installation, and flood wall construction.

D. The Contractor is responsible for compatibility between joints of all items they supply and connection of the new pipe to existing pipe to remain at the limits of existing pipe removal.

1.6 SUBMITTALS

A. Submit shop drawings and product data, including piping layouts, design calculations, warranty test reports, in accordance with Section 01300 and the referenced standards.

B. Submit the name of the pipe and fitting suppliers and a list of materials to be furnished.

C. Prior to shipment of pipe, certified copies of mill tests confirming the type of materials used in the pipe, and shop testing of pipe to show compliance with the requirements of the applicable standards, along with a sworn affidavit of compliance that the pipe complies with the referenced standards, shall be submitted.

D. Submit copies of all shop tests, including hydrostatic tests.

E. Submit shop drawings with a tabulated laying schedule for piping which references stations and invert elevations as shown on the Drawings or measured in the field as well as all fittings, bends, outlets, restrained joints, tees, special deflection bells, adapters, solid sleeves and specials, along with the manufacturer's drawings and specifications providing complete details of all items. The laying schedule shall show pipe class, class coding, station limits and transition stations for various pipe classes. The above shall be submitted to the Owner for approval before manufacture and shipment. The location of all pipes shall conform to the locations indicated on the Drawings. Full length pipe may be supplied from inventory provided that all specification requirements are met. Shop drawings shall include but not be limited to:

1. Complete and dimensional working drawings of all pipe layouts, including pipe stationing, invert elevation at changes in grade or horizontal alignment, all elements of curves and bends both in horizontal alignment and vertical position.
2. The grade of material; size and wall thickness of the pipe and fittings and appurtenances; type and location of fittings, specials, and valves; and the type and limits of the lining, lining reinforcing and coating systems of the pipe and fittings. Methods and procedures recommended by the coating manufacturer shall be documented.
3. Joint details; methods and locations of supports; and complete information concerning type, size and location of all welds. Shop welds (no field welding will be allowed) shall be clearly differentiated and welds shall be clearly detailed with preparation procedures for all pipe and parent material comprising each weld. Critical welding procedures shall be identified along with methods for controlling welding stresses and distortions. Locations and proposed joint details shall also be clearly identified.
4. Method of manufacture of pipe; joint details; fittings; and any specials,
5. Dimension and general depth for typical pipe lengths.
6. Detail of joint between pipes for both push-on and restrained joints together with installation instructions.
7. Dimensions and general details for all fittings including joint details for both mechanical and restrained joints.
8. Dimensions, products, general details, and proposed layout of any proposed temporary bypass measures.
9. All other pertinent information for all items to be furnished; product data to show compliance of all couplings, supports, fittings, coatings and related items.
10. Prior to furnishing the pipe-laying schedule, test pits shall be dug where the new pipe connects to the existing pipe(s) to remain to ascertain the location, elevation, and cross-sectional dimensions of the present lines. This information shall be forwarded to the pipe manufacturer for incorporation into the pipe-laying schedule.

F. Submit anticipated production and delivery schedule.

G. Prior to shipment of pipe, submit a certified affidavit (i.e. certificates) of compliance from the manufacturer stating that the pipe, fittings, gaskets, linings and exterior coatings for this project have been manufactured and tested in accordance with AWWA and ASTM standards and requirements specified herein. No pipe or fittings may be installed without such certification.

H. Submit handling procedures for all phases from finished fabrication through delivery including storage, transportation, loading, and unloading. This shall include storage at the project site and required protection following installation prior to startup.

1.7 DELIVERY, HANDLING & STORAGE

A. All pipe and appurtenances are subject to examination by the Owner or the Engineer at the point of delivery. Material found to be defective due to manufacture or damage in shipment shall be rejected or recorded on the bill of lading and removed from the job site. The Owner or its Engineer reserves the right to require tests as specified in the applicable AWWA standard to ensure conformance with the

standard. In case of failure of the pipe or appurtenance to comply with such specifications, the Contractor shall replace defective materials at no additional cost to the Owner.

B. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe, pipe linings and pipe coatings. See AWWA C600 and the referenced AWWA Standards for Shipping, handling and storage procedures.

C. Pipe shall be transported to the job site on padded bunks or oak timbers and secured with steel banding or nylon tie down straps to adequately protect the pipe and coating. Slings, hooks, or pipe tongs or other devices acceptable to the Owner or Engineer shall be used in pipe handling. No uncushioned ropes, chairs, wedges, cables or levers shall be used in handling finished pipe, fittings or couplings. Under no circumstances shall the pipe or fittings be dropped or skidded against each other. Care shall be taken to protect pipe coating. Padded wooden pipe cradles, or chocks suitable for the protection of coatings shall be used between finished pipes and beneath them when pipes are placed upon rough surfaces. Pipe shall not be stored on bare ground unless soft sand berms are used to support the pipe and are accepted by the Owner or Engineer.

D. Stored materials shall be kept safe from damage. The interior of all pipe, fittings and other appurtenances shall be kept free from dirt, excessive corrosion or foreign matter at all times.

E. Pipe shall not be stacked higher than the limits recommended by its manufacturer. The bottom tier shall be kept off the ground on timbers, rails, or concrete. Stacking shall to manufacturer's recommendations and/or AWWA C600

F. Gaskets for mechanical and push-on joints to be stored shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.

G. Mechanical-joint bolts shall be handled and stored in such a manner that ensures proper use with respect to types and sizes.

PART 2. PRODUCTS

2.1 DUCTILE IRON PIPE

A. Inside of pipe shall have a double cement lining with seal coating that meets or exceeds the requirements of AWWA/ANSI Standard C104/A21.4. Outside of pipe shall have standard bituminous coating.

B. Thickness class, unless otherwise indicated or specified:

1. Minimum Thickness Class 52.

2. Minimum thickness Class 53 for use with flanged pipe. Minimum thickness for use with grooved couplings conforming to AWWA C606 except minimum thickness Class 56 for ductile-iron pipe 18 in. and larger.

C. Restrained joint pipe shall be TR-Flex by U.S. Pipe, Flex-Ring by American Cast Iron Pipe Co. or acceptable equivalent.

D. A Certificate of Compliance indicating conformance with the above specified requirements for ductile iron pipe shall be submitted to the Engineer. Certificates of Compliance shall be submitted prior to

shipment of the pipe. Certificate of Compliance shall be notarized by a Notary Public or Justice of the Peace.

2.2 END TREATMENTS/JOINTS

A. Ductile iron pipefitting joints shall be push-on rubber gasket type employing a single elongated grooved rubber gasket or rubber-gasket mechanical joint per AWWA C111 in unrestrained areas. In restrained areas, both pipe and fitting joints shall be push on rubber gasket, locking ring type restrained joints per the manufacturer' standard described in Paragraph E. All gasket materials shall comply with Table 5-1 of AWWA M-41. Rubber-gasket joints shall conform to AWWA C111. Gasket shall be of styrene butadiene rubber (SBR).

B. Unless otherwise noted, all ductile iron pipe/fitting joints shall be push-on rubber gasket type per AWWA C111 in unrestrained areas.

C. The grooved rubber gaskets and joint lubricant shall be furnished with the pipe. The gasket shall be plainly identified as to the pipe size and packaged in a suitable and satisfactory manner for shipment.

D. All joint accessories shall be furnished with each pipe and shall be plainly identified as to pipe size.

E. Restraint for push on joint pipe shall be positive locking "Locked-type" joints manufactured by the pipe and fitting manufacturer that utilize restraint independent of the joint gasket. All restrained joints shall be suitable for the specified 350 psig test pressure. Joints shall be fabricated of heavy section ductile iron casting. Bolts and nuts shall be low carbon steel conforming to ASTM A193 Grade B7. Restraint for mechanical joint pipe shall use retainer glands for restraining joint, EBAA Iron, Inc. 800 series or approved equal. Restrained push on joints shall be by one of the following or an approved equal:

1. "TR Flex" by US Pipe and Foundry Company
2. "Snap Lok" by Griffin Pipe Products Company.
3. "Superlok"by Clow Water Systems Company

F. The minimum number of restrained joints required for resisting forces at fittings and changes in direction of the pipe shall be determined from the length of restrained pipe on each side of the fittings and changes in direction necessary to develop adequate resisting friction with the soil.

G. Restrained pipe joints that achieve restraint by incorporating cut out sections in the wall of the pipe shall have a minimum wall thickness at the point of the cut out that corresponds with the minimum specified wall thickness for the rest of the pipe.

H. Couplings and Adapters

1. For cast-iron pipe to ductile iron pipe connections, sleeve type couplings shall be Dresser Style 38, 138 or equal. Couplings shall be furnished with black steel bolts and nuts and with pipe stop removed. The couplings shall be provided with plain, Grade 27 rubber gaskets and with black, steel, trackhead bolts and nuts. When buried in the ground, the bolts and nuts shall be stainless steel.

    a. Buried sleeve-type couplings shall have a protective wrapping of “Denso” material by DENSO Inc. of Texas or equal. Where “Denso” material is used, the joint shall be packed up with "Densyl mastic" to give an even contour for wrapping with "Densopol" tape. A 1.5

millimeter (mm) thick coating of “Denso” paste shall be applied following by 100mm or more wide "Densopol" tape wound spirally round the joint with at least 50 percent overlap.

2. All sleeve type couplings 24-inches and smaller shall be restrained using a harness restraint assembly suitable for the pressures required, as manufactured by Star National Products of Ohio or approved equal. All components of the restraint system shall be for buried service and corrosion resistant. A manufacturer's certification as to the quality of the material (i.e. tiebolts, tienuts, tierods, tiecouplings, tie washers, etc.) shall be furnished for all joint restraint products. Manufacturer shall determine the number of tie rods required.

3. Split Sleeve type flexible couplings shall be Victaulic Depend-O-Lok Style E x E (unrestrained) or F x F (self-restrained) or equal.

4. Grooved flexible joints for ductile iron pipe sizes 36-inch and smaller must be in accordance with AWWA C606 and shall be Victaulic Style 31 or equal.

5. Shouldered flexible joints for ductile iron pipe larger than 36-inches shall be Victaulic Style 44 or equal.

2.3 FITTINGS

A. Pipe fittings shall be ductile iron with pressure rating of 350 psi for 24-inch and smaller piping and 250 psi for 30-inch and larger piping. Fittings shall meet the requirements of AWWA C110 or AWWA C 153 as applicable. Fittings shall have the same pressure rating, as a minimum, of the connecting pipe.

B. All fittings shall have mechanical joints as specified in AWWA C111.

C. Bolt holes in the mechanical joint bells of all fittings shall straddle the vertical centerline of the fitting (laying in horizontal position).

D. All joint accessories shall be furnished with each fitting and shall be plainly identified as to size.

E. Compact ductile iron fittings that meet AWWA specification may be used if approved in writing by the District.

PART 3. EXECUTION

3.1 STORAGE OF WATER PIPE AND FITTINGS

A. Prior to storing water pipe and fittings on the job site, the Engineer and the Owner shall be notified at least 24 hours in advance as to when pipe and fittings will arrive. Upon arrival, the Engineer may visually inspect the pipe for class rating and evidence of mishandling.

B. After acceptance of the pipe and fittings, the Contractor shall provide a water tight seal at both ends of the pipe, with a minimum of 4 mil. polyethylene plastic wrap. This shall be accomplished using sheet plastic or bags secured with duct tape.

C. All pipe shall be stacked on 4 inch x 4 inch timbers in tiers with chocks nailed at each end to prevent movement of the pipe. A maximum allowance for height is specified under Part 1 of this Section.

D. Loader forks are allowed for the unloading and stacking of pipe provided it is done with care. If pipe hooks are used in the ends of pipe for unloading purposes, they should be of special shape and padded

so as to fit either the plain or bell end without damaging the pipe lining. Lifting chains shall not be allowed in place of pipe hooks.

E. Transporting of the pipe from the stacked pile to the trench by a loader using forks or approved hooks is acceptable provided it is done with care. The pipe may not be strung along the ditch line until after review of the locations and acceptance by the Engineer.

3.2 BURIED PIPE INSTALLATION

A. All water mains, valves, fittings and appurtenances shall be laid/installed in the dry and shall be installed in accordance with the manufacturer's recommendations. Ductile iron pipe, fittings and appurtenances shall be installed in accordance with the requirements of AWWA Standard C 600, latest edition.

B. Water mains and appurtenances shall be installed in accordance with the horizontal and vertical alignment shown on the Contract Drawings and at least 5.5 feet below finished grade, unless approved by the Owner. The Contractor shall investigate and locate connections to existing pipes, valves, meters, or other appurtenances to remain.

C. Should any deviations in the alignment be necessary due to conflicts with other utilities or other reasons, the changes must first be approved by the Engineer. Any deviations in design and as built pipeline locations must be noted in the record drawings by the Contractor.

D. Water main shall be continuously bedded in bedding material as specified herein. Bedding shall be installed not less than six (6) inches below the bottom of the pipe and up to the spring line (mid-point) of the pipe. Bedding shall be tamped or chinked into place after the pipe is set in place.

E. Pipe sections shall be lowered into the trench and set in place in such a manner so as to prevent damage or injury to the pipe. The Contractor shall use slings, straps, or other approved means to adequately support the pipe as it is being lifted and lowered into the trench. Pipe shall not be dropped from trucks onto the ground or into the trench. Any pipe so dropped shall be immediately rejected and removed from the job site by the Contractor.

F. Each length of pipe to be installed shall be examined by the Engineer for cracks, defects or damage in the coating or lining, and any other evidence of unsuitability. The Contractor shall keep the length of open/excavated trench to a minimum. Trenches shall be backfilled to within two (2) pipe lengths of the end of the pipe being laid and backfilled for compaction. Trenches shall be backfilled at the end of the day and shall not be left open overnight.

G. Whenever pipe installation work is not in progress, the end(s) of the pipe being installed shall be satisfactorily plugged to prevent intrusion of soil, stones, water, debris, animals, or other such materials into the pipe. When pipe laying operations resume, the end(s) of the pipe shall be thoroughly cleaned and the temporary plugs removed.

H. Push-on joints shall be made in strict accordance with the manufacturer's instructions and as specified in AWWA Standard C 600, latest edition. A rubber gasket shall be inserted in the groove of the bell end of the pipe and joint surfaces cleaned and lubricated. The plain end of the pipe to be entered shall then be inserted in alignment with the bell of the pipe to which it is to be jointed and pushed home with a jack or by other means. After jointing the pipe, a metal feeler shall be used to make certain that the rubber gasket is located correctly.

I. Mechanical joints at valves, fittings and where designated shall be in accordance with the "Notes on Method of Installation" under ANSI Specification A21.11 and the instructions of the manufacturer. To assemble the joints in the field, the Contractor shall thoroughly clean the joint surfaces and rubber gasket with soapy water before tightening the bolts. Bolts shall be tightened to the specified torques. The use of extension wrenches or pipe over handle of ordinary ratchet wrenches to secure greater leverage shall not be allowed.

J. Joint Deflection. When it is necessary to deflect pipe at the joints from a straight line in either the vertical or horizontal plane, the amount of joint deflection shall not exceed fifty (50) percent of the manufacturer's maximum recommended joint deflection.

3.3 CUTTING OF PIPE

A. The cutting of pipe for inserting valves, fittings, or closure pieces shall be done in a neat workmanlike manner without damage to the pipe or cement lining. Unless otherwise noted, cutting shall leave a smooth end at right angles to the axis of the pipe.

B. 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, cutting torches, diamond points, and dog chisels will not be permitted. This work shall be done by the Contractor in a manner satisfactory to the Engineer and only experienced personnel shall be engaged thereon.

C. Flame cutting of the pipe by means of an oxyacetylene torch shall not be allowed.

3.4 INSTALLATION OF BURIED VALVES & FITTINGS

A. Large valves (i.e. greater than 10 inches) shall be supported with blocking so as to prevent the weight of the valve from being supported by the pipe during installation.

B. Valve boxes shall be installed with a cushion of sand between the valve and the valve box. In wet areas, washed stone shall be placed around the valve box with a layer of straw or a geotextile fabric to prevent fine soil from mixing with stone during initial backfill. Valves and boxes shall be set with the stem vertical and box vertically centered over the operating nut. Valves shall be set on a firm foundation and supported by tamping backfill material under and at the sides of the valve. The valve box shall be supported during backfilling and maintained in vertical alignment with the top flush with finish grade.

C. Retaining glands shall be used on all fittings, bends, caps, plugs and at other locations as indicated by the Engineer or shown on the Drawings.

D. Couplings and fittings shall be installed in accordance with the manufacturer's recommendations.

E. Refer to Section 02665 for additional requirements.

3.5 CLEANING

A. At the conclusion of the work, thoroughly clean all of the pipe to remove all dirt, stones, pieces of wood, or other material which may have entered during the construction period. All debris shall be removed from the pipeline. The Contractor shall take extreme caution when installing the pipe to prevent debris from entering it. Contractor shall use watertight plugs as specified.

B. If dirt or debris enters a water main during construction, the Contractor shall remove the debris and swab the interior of the pipe with a 5.26 percent chlorine solution. If the Owner determines that debris cannot be adequately removed by manual methods, then the material shall be removed by mechanical means (i.e. hydraulically propelled foam pig) and swabbed with a 5.26 percent chlorine solution. Any mechanical means of removal shall be at no additional cost to the Owner.

C. After the pipe has been cleaned and water in the excavation is above the pipe following a heavy rain, the Owner will examine the pipe for leaks. If defective pipes, fittings or joints are discovered at this time, they shall be repaired or replaced by the Contractor at no additional cost to the Owner.

3.6 TESTING

A. All water pipes shall be hydrostatically pressure tested for leakage prior to acceptance.

B. All pipelines shall be thoroughly flushed prior to testing to remove all soil, debris and other materials that may have entered the lines during construction. Flushing shall be accomplished by partially opening and closing valves several times under expected line pressure, with flow velocities adequate to flush deposited material(s) out of the pipes and valves. Flushing velocities shall not be less than 3.5 to 4.0 feet per second (FPS).

C. Water mains shall be tested at a pressure equal to 1.5 times the maximum expected working pressure of the line segment being tested. Pressure testing shall be conducted in accordance with Section 4 of AWWA Standard C 600, except as otherwise specified herein.

D. Prior to applying the specified test pressure, all air shall be expelled from the lines. If a suitable means of expelling air at high points does not exist, the Contractor shall install all necessary taps so that air can be purged and the testing completed. Upon completion of the pressure tests, the corporation stops shall either be left in place or removed and plugs inserted as indicated by the Engineer and/or the Owner.

E. The pressure shall be raised to the test pressure required for each section being tested as determined by the Engineer. When the test pressure is reached, the time shall be recorded and the test shall begin. The duration of each pressure test shall be a minimum of two (2) hours. During the test, pressure shall be maintained in the section of pipeline being tested by means of a recirculating by-pass type test pump located at the upstream end of the pipe. Water shall be added in measured amounts from a container of known volume if required to maintain pressure. The addition of excessive amounts of water, as judged by the Engineer, shall constitute immediate test failure. All gauges and test equipment must be accepted by the Engineer.

F. During the test, the line will be examined by the Engineer or Owner’s Representative for visible leaks and breaks. Any defects in the line shall be repaired, and any defective materials shall be removed and replaced by the Contractor at no additional cost to the Owner.

G. Leakage Test. The leakage test shall be performed in conjunction with the pressure test. Leakage and allowable leakage shall be as defined in Section 4 of AWWA Standard C 600, latest edition.

H. Allowable leakage (per AWWA Standard C 600) at various test pressures is shown in Table 1 which follows:

TABLE I
Allowable Leakage per 1,000 ft (305m) of Pipeline* - gph†

Avg. Test Pressure psi (Bar)	Nominal Pipe Diameter - Inches (mm)															
	3 (75)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)	14 (350)	16 (400)	18 (450)	20 (500)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	54 (1370)
450 (31)	0.48	0.64	0.95	1.27	1.59	1.91	2.23	2.55	2.87	3.18	3.82	4.78	5.73	6.69	7.64	8.60
400 (28)	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.50	5.41	6.31	7.21	8.11
350 (24)	0.42	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	2.81	3.37	4.21	5.06	5.90	6.74	7.58
300 (21)	0.39	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	3.12	3.90	4.68	5.46	6.24	7.02
275 (19)	0.37	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49	2.99	3.73	4.48	5.23	5.98	6.72
250 (17)	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56	4.27	4.99	5.70	6.41
225 (16)	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38	4.05	4.73	5.41	6.03
200 (14)	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19	3.82	4.46	5.09	5.73
175 (12)	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98	3.58	4.17	4.77	5.36
150 (10)	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76	3.31	3.86	4.41	4.97
125 (9)	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52	3.02	3.53	4.03	4.53
100 (7)	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.80	2.25	2.70	3.15	3.60	4.05

* If the pipeline under test contains sections of various diameters the allowable leakage is the sum of the computed leakage for each size.

† To obtain leakage in liters/hour, multiply the values in the table by 3.7854

I. Results

1. If the section fails to pass the pressure and leakage test, the Contractor shall locate, uncover, and repair or replace the defective pipe, fitting, or joint, all at his own expense and without extension of time for completion of the work. Additional tests and repairs shall be made until the section passes the specified test.

2. If, in the judgment of the Engineer, it is impractical to follow the specified procedures exactly for any reason, modifications in the procedure shall be made as required or accepted; but, in any event, the Contractor shall be responsible for the ultimate tightness of the piping within the above requirements. The tests shall be repeated as often as necessary, and at the Contractor's expense, to assure the Owner and Engineer that all piping and valves are free of defects and that all joints are tight.

3.7 TESTING VALVES

A. All valves shall be pressure tested during the pipeline test. An acceptable test for each gate valve shall be no loss of pressure in the line test pressure as each valve is closed.

B. The Contractor shall make any taps and furnish all necessary caps, plugs, tees, etc., as required to facilitate testing. The Contractor shall also furnish a test pump, gauges and any other equipment required in conjunction with conducting the hydrostatic tests. The Contractor shall at all times protect the water mains from damage and existing water mains from contamination.

PART 4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement and payment of Contract Item 02660.1 REMOVE AND REPLACE 6-INCH WATER SERVICE shall be made at the contract lump sum unit price for the limited removal and replacement of the 6-inch water service installed and complete to the limits indicated on the Contract Drawings. This price shall include full compensation for all for all survey; supervision; utility coordination and notification; equipment; labor; materials; pipe and fittings; joints, gaskets, and adhesives; mechanical restraint devices; valves, valve boxes, and appurtenances; masonry and cementitious materials; handling; storage; excavation; subgrade preparation; installation; pipe placement and connection; cleaning and testing; backfilling; dewatering; compaction; grading; associated modification and repair of existing utility structures; and any other incidental or appurtenant work required to remove and replace the 6-inch water service as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work.

4.2 PAYMENT ITEMS

Payment for the scope of the work specified herein, including all labor, materials, equipment, and incidentals associated with the installation of new ductile iron pipe and fittings for the water service replacement, connection, cleaning, pressure testing, and all other work incidental to this item shall be paid for at the applicable Lump Sum price stated on the Bid Form.

ITEM NO.	PAYMENT ITEM	UNIT
02660.1	REMOVE AND REPLACE 6-INCH WATER SERVICE	LUMP SUM

END OF SECTION

SECTION 02665

VALVES AND APPURTENANCES

PART 1. GENERAL

1.1 SCOPE

A. The work covered by this section shall include the furnishing of all labor, materials, equipment, and incidentals required to install, complete and ready for operation, all valves, valve boxes, and appurtenances as shown on the Contract Drawings, as required to complete the work and as specified herein.

1.2 REFERENCES

A. The specifications and standards referenced herein, in the editions cited, published by the following organizations, form a part of this section.

B. American Water Works Association (AWWA)

C. American Society for Testing and Materials (ASTM)

1.3 RELATED SECTIONS

01010	SUMMARY OF WORK
01100	SPECIAL PROVISIONS
01300	SUBMITTALS
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02300	EARTHWORK
02660	DUCTILE IRON PIPE AND FITTINGS
02760	ABANDONEMENT OF PIPES

1.4 QUALITY ASSURANCE

A. Valves and accessories shall be new and manufactured in the United States of America

B. Inspect and test at foundry according to applicable standard specifications.

C. The Owner reserves right to inspect and test by independent service at manufacturer's plant or elsewhere at his own expense.

D. Visually inspect and open/close before installation to ensure proper operation.

1.5 SUBMITTALS

A. At least five (5) calendar days prior to the installation of the valves and piping, the Contractor shall submit to the Owner’s Engineer the following information:

1. A schematic of the proposed piping system along with manufacturer's catalog data on the valve, including joints, fittings, and pipes to be used.
2. Complete manufacturer's specifications, including material descriptions.

3. Description of manufacturer's standard materials and coating of major components.
4. Recommended spare parts and cost information.
5. List of special tools furnished with the equipment.
6. List of materials and supplies furnished with the equipment.
7. Approximate shipping weight of the equipment and, if shipped unassembled, the number of components and approximate weight of each.

1.6 DELIVERY, STORAGE, HANDLING

A. Prepare valves for shipping as follows:
1. Ensure valves are dry and internally protected against rust and corrosion.
2. Protect valve ends against damage to threads, flange faces, and weld-end preps.

B. Use the following precautions during storage:
1. Do not remove valve end protectors (unless necessary for inspection); then reinstall for storage.
2. Protect valves from weather. Store valves indoors. Maintain valve temperature higher than the ambient dew point temperature. If outdoor storage is necessary, support valves off the ground or pavement in watertight enclosures.

C. Use a sling to handle valves whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use handwheels and stems as lifting or rigging points.

PART 2. PRODUCTS

2.1 GENERAL

A. Valves and appurtenances shall conform to the standards of the Owner.

B. Valve sizes shall be the same size as the upstream pipe, unless otherwise indicated.

C. Provide accessories including bolts, nuts, glands, and gaskets.

D. Valves shall have the same end connections as the pipeline in which it is installed. All pipe connections shall be flanged or mechanical.

E. Valves, and appurtenances installed on this project shall be manufactured and installed in compliance with the following specifications. Types and sizes of valves, and appurtenances shall be as designated on the Drawings. All valves shall be of standard manufacture and of highest quality, both as to material and workmanship. All valves shall have the name monogrammed or initialed by the manufacturer thereon and shall be identified by catalog numbers.

F. Valves and appurtenances of the same type shall be from one manufacturer.

G. All valves shall be of ample strength to withstand and operate satisfactorily under the working pressures and shall be designed for normal cold-water use.

H. All valves shown on the Drawings in one view or schematic but missing on other views or schematics are required. All valves with non-rising stems shall have valve position indicators if not buried.

2.2 GATE VALVES

A. Gate valves shall be of the double rotating disc, ductile iron body, parallel seat design. Independent wedging action shall be designed to spread the two discs against the seats in the valve body. Seats in the valve body shall be field replaceable without removing the valve from the pipeline. Discs are to be free to revolve 360 degrees for even distribution of wear on disc face and mating seat rings.

B. The two discs must be interchangeable with each other and field replaceable without removing valve from pipeline. Either disc must be able to seat with line pressure.

C. Wedging surfaces shall be protected by stainless steel shoes for corrosion resistance.

D. Valves to be available with flanged or mechanical joint ends for connection to piping specified.

E. Non-rising stem valves without gears shall have double O-ring stem seals instead of conventional packing. Valve design shall allow replacement of the O-rings with the valve under pressure in the full open position.

F. All valves 16 inches and larger to be equipped with gearing for facilitation of opening. When bypass valve is furnished, it shall be bolted to the bottom or side of the main valve as required.

G. All valves shall be equipped with an operating nut oriented for vertical operation. All operating nuts shall be 2 inches square.

H. Valves shall be rated up to 250 pounds per square inch (psi) cwp. All valves shall be subject to seat test between gate discs as well as shell test for body and bonnet. Shell test to be at twice the rated working pressure for all size valves.

I. All internal and external ferrous surfaces shall be coated with liquid applied epoxy in compliance with NSF-61. Valves to be equal in all respects to the Kennedy Double Disc Parallel Seat ValveSeries.

J. Buried valves or valves used with extension stems shall be inside screw, non-rising stem with mechanical joint ends.

K. Bronze gate rings shall be rolled, peened or pressed into grooves of dovetail or similar shape in the gates. Body-seat rings shall be bronze-threaded and screwed into the body.

L. Stuffing box follower bolts shall be of steel and the nuts shall be of bronze. O-ring stuffing boxes may be used.

M. The design and machining of the valves shall be such as to permit packing the valves without undue leakage while they are wide open and in service.

N. Valves shall be Kennedy Double Disc Parallel Seat Valve or approved equal.

2.3 EXTENSION STEMS

A. Where the depth of the valve is such that its centerline is more than 4 feet below grade, provide operating extension stems to bring the operating nut to a point 6 inches below the surface of the ground and/or box cover. Extension stems shall be steel and shall be complete with 2-inch square operating nut.

B. Construct shafts and coupling of carbon steel, galvanized after fabrication. Provide 2-inch operating nut.

C. Size shafts to safely withstand repeated reversals and stress due to full thrust of operating mechanism. Couple shaft to valve stem with a coupling, with a torque rating equal to, or greater than, torque required to operate the valve.

2.4 VALVE BOXES

A. Provide a valve box of the adjustable type of heavy pattern, constructed of cast iron and provided with a 6 inch cast iron cover for each buried valve.

B. Valve boxes shall be manufactured in North America by Clow Corporation, Tyler/Union Corporation, United States Foundries, or equal.

C. Valve boxes shall be round, 2-piece, sliding type, cast iron. The upper section of each box shall have a flange on top having sufficient bearing area to prevent settling. The bottom of the lower section shall be belled to enclose the operating nut of the valve. The barrel shall be 5½- inch O.D. minimum.

D. Boxes shall be of lengths consistent with pipe depths. Boxes shall be adjustable, with a lap of at least 6 inches when in the most extended position.

E. Slot covers for easy removal.

F. Covers for valve boxes on water mains shall have the word WATER cast in the top.

G. Coat valve boxes with coal-tar pitch enamel or other approved coating.

H. Valve boxes shall be suitable for the size valve on which they are used. The length of the lower section shall be adequate for trench adjustment, no top or mid-section adapters.

I. Provide at least one tee-handled wrench for the valves installed, unless additional wrenches are required due to variations in valve bury depth. Wrenches shall be field measured to accommodate the depth of bury and provide waist high operation.

2.5 ENCASEMENT MATERIAL

A. Encasement material shall be polyethylene film per AWWA C105 with a minimum thickness of 8 mils.

PART 3. EXECUTION

3.1 EXAMINATION

A. Examine valve interior through the end ports 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. Actuate valve through an open-close and close-open cycle. Examine functionally significant features, such as guides and seats made accessible by such actuation. Following examination, return the valve closure member to the shipping position.

C. Examine threads on both the valve and the mating pipe for form (i.e., out-or-round or local identification) and cleanliness.

D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Check gasket material for proper size, material composition suitable for service, and freedom from defects and damage.

E. Prior to valve installation, examine the piping for cleanliness, freedom from foreign materials, and proper alignment.

F. Replace any defective valves with new valves at no additional cost to the Owner.

3.2 VALVE INSTALLATION

A. Check operation of all valves before installing.

B. It is the Contractor’s responsibility to verify the size of the pipes. If valves are not the correct size the Contractor shall furnish new valves of the correct size at no additional cost to the Owner.

C. Install valves per accepted manufacturer's written instructions and the requirements of AWWA C500. All bolt threads shall be lubricated with graphite and oil prior to installation.

D. Install valves in horizontal piping with stem at or above the center of the pipe. Install valves and actuators to be plumb in the vertical direction.

E. Wrap buried fittings and flanged joints with 2 layers of polyethylene film per AWWA C105. Complete the wrap prior to placing concrete anchors, supports and thrust blocks.

F. Install support blocking in accordance with NFPA 24 and as shown in Contract Drawings.

G. Valve box covers shall be seated flush and encased in a concrete slab shown in the Contract Drawings

3.3 FIELD QUALITY CONTROL

A. After piping systems have been tested and put into service, but before final adjusting and balancing, inspect valves for leaks. Adjust or replace packing to stop leaks; replace valves if leak persists.

3.4 CLEANING

A. Clean mill scale, grease, and protective coatings from exterior of valves and prepare valves to receive finish painting or coating.

3.5 FINAL ACCEPTANCE WARRANTY

A. Final acceptance of all equipment furnished under these Specifications will be withheld until after the installation and field testing by the Owner's Representative. The manufacturer and the Contractor shall guarantee the equipment against defects of any kind for a period of one year after final testing and acceptance.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. No separate measurement of quantities or payment shall be made for the work of this Section. The Contractor shall include all costs for the work specified within this Section under the related Contract Items for which the work is incidental and required.

END OF SECTION

SECTION 02710

UNDERDRAIN SYSTEM

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall furnish all labor, materials, and equipment and shall perform all work required to construct the new underdrain system, as shown on the plans, and as specified in this and other sections.

B. The work of this item shall consist of the construction of a new underdrain system along the protected side of dikes and floodwall segments as shown on the Contract Drawings. The underdrain pipes shall connect to existing stormwater structures as indicated on the Contract Drawings.

C. The purpose of the underdrain system is to collect subsurface seepage through the dikes, embankment, floodwall foundations, and to discharge it in a controlled manner. The system shall be constructed in such a manner as to facilitate that goal.

D. The areas where new underdrain will be installed shall be cleared, grubbed, and stripped prior to the work of this Section.

E. The work of constructing underdrain system shall include, but not be limited to, the following:

1. Excavation of trenches for the underdrain.
2. Provision and installation of perforated PVC underdrain pipe, solid PVC pipe, cleanouts, and fittings as necessary to complete the proposed underdrain system.
3. Connection of the new underdrain system to existing on-Site stormwater collection structures.
4. Backfill and compaction of select filter stone material around the underdrain pipes and associated cleanouts. Backfill and compaction of suitable fill materials as required to achieve finished grades beyond the filter stone.
5. All other incidental work necessary to construct the underdrain system as shown on the Contract Drawings.

1.2 RELATED WORK

A. The following is a list of related work items that shall be performed or furnished under other sections of these specifications as indicated:

SECTION 01010	SUMMARY OF WORK
SECTION 01100	SPECIAL PROVISIONS
SECTION 01560	TEMPORARY EROSION AND SEDIMENTATION CONTROL
SECTION 01740	SITE RESTORATION
SECTION 02065	DEMOLITION, REMOVAL, AND DISPOSAL
SECTION 02110	CLEARING, GRUBBING, AND STRIPPING
SECTION 02300	EARTHWORK

SECTION 02319 TEMPORARY WATER CONTROL

SECTION 02510 BITUMINOUS CONCRETE PAVEMENT

SECTION 02760 PIPELINE ABANDONMENT

SECTION 02930 LOAMING, SEEDING, AND REVEGETATION

SECTION 03300 CAST-IN-PLACE CONCRETE

1.3 REFERENCE STANDARDS

ASTM D1784 Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

ASTM D2729 Standard Specification for Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

1.4 SUBMITTALS

A. Not less than five (5) calendar days prior to the scheduled start of construction of the underdrain system, the Contractor shall submit shop drawings and material certifications and samples as per the requirements of the individual technical specifications. These shall include, but not be limited to, information on PVC pipe products.

PART 2. PRODUCTS

2.1 PVC DRAIN PIPE

A. All PVC pipe shall be manufactured from a Type I, Grade I Polyvinyl Chloride (PVC) compound with a Cell Classification of 12454 per ASTM D1784. The pipe shall be manufactured in strict compliance to ASTM D1785 and D2665 (where applicable), consistently meeting and/or exceeding the Quality Assurance test requirements of these standards with regard to material, workmanship, burst pressure, flattening, and extrusion quality. The pipe shall be manufactured in the USA, using domestic materials, by an ISO 9001 certified manufacturer. Standard lengths of pipe sizes 6 inches and larger shall be beveled each end by the pipe manufacturer.

B. All PVC joints shall be made in accordance with ASTM D2729.

C. Perforations shall be circular holes free of any cuttings, frayed edges or material that could impede flow. Diameter shall be as shown on the drawings ±1/16-inch (0.0625”). Holes shall be arranged in rows parallel to pipe axis. Perforations shall be spaced evenly along each row such that the center-to-center distance between holes is not less than 8 times the hole diameter. Minimum perforation opening shall be as follows:

Nominal Pipe Size (inches)	Minimum Number of Rows	Minimum Opening Area per Foot of Pipe (in^2)
4	2	0.22
6	4	0.44
8	4	0.44
10	4	0.44
12	6	0.66

Rows shall be spaced uniformly. Rows shall be arranged at equal distance from the bottom on each side of the vertical centerline of the pipe with rows of perforations separated by an arc of 60 to 125 degrees. Perforations shall only be drilled on the bottom half of the pipe.

D. Pipe shall be underdrain type as manufactured by CertainTeed Corporation or approved equal.

2.2 CLEANOUTS

A. Cleanouts shall be constructed with solid Schedule 80 PVC pipe. Schedule 40 PVC Tee or Wye connections shall be used to connect the cleanout to the perforated underdrain pipe.

B. Covers for the cleanouts shall be manufactured from the same material as the cleanout fittings, and shall be threaded, solid plugs to prevent surface drainage and soil from entering the toe drain system.

C. Cleanout frame and cover assemblies shall be round, constructed of cast iron ASTM A48 Class 35B with a minimum inside clear diameter equal to the cleanout riser pipe diameter plus 2 inches, or as otherwise indicated on the Contract Drawings.

D. Concrete for cleanout collars shall be in accordance with Section 03300 – Cast-in-Place Concrete.

PART 3. EXECUTION

3.1 PREPARATORY WORK

A. Prior to beginning the construction of the underdrain system, the proposed locations shall be cleared, grubbed, and stripped. Where required, filling, compaction, and grading of underlying soil shall be performed as specified in Section 02300 - Earthwork.

B. Prior to the beginning of construction of the toe drain system, any unsuitable soil material found in the existing subgrade shall be removed and replaced with compacted fill to the satisfaction of the Engineer.

C. Prior to the start of work on underdrain system, all water control and erosion and sedimentation control measures must be in place.

3.2 UNDERDRAIN CONSTRUCTION

A. Excavate the trenches for underdrain collection pipes to the lines and grades shown on the Contract Drawings. All earthwork, including excavation support, shall conform to Section 02300 - Earthwork. The maximum length of open trench shall not exceed forty feet (40’). The intent is to limit the effects of the excavation on the stability of the surrounding embankment and other nearby features.

B. Construct underdrain cleanouts at the locations shown on the Contract Drawings, at intervals not to exceed 100 linear feet, at fittings where the horizontal direction change is greater than 45°, and at all terminal ends of underdrain lines

C. Place and join the perforated and solid pipe as per the pipe manufacturer’s specifications.

D. Prepare the existing drain structures to receive the underdrain inlet pipe connections. Minimize demolition and disturbance of the existing drain structures to the extent necessary to perform the Work. Inlet pipes shall be set flush with the inside face of the drainage structure wall. Remaining gaps between

the drainage structure and exterior of the underdrain inlet pipe shall be filled neatly with hydraulic cement, masonry, or approved alternative system in accordance with Section 03300 – Cast-in-Place Concrete, as to prevent leakage.

E. Install solid end caps onto the terminal ends of underdrain pipes as indicated on the Contract Drawings and at the end of any underdrain pipe that is not continuous, specifically noted as a discharge point, or functions as an inlet to another drainage structure.

F. Working ends of pipe, couplings, and exposed perforations shall be protected from sedimentation by temporary caps and suitable filter material as necessary until construction of the underdrain system is completed. Refer to Sections 01560 and 02300 for additional requirements.

G. Backfill the trench with filter stone and compact in 6-inch maximum thick lifts. Compact each lift with four passes of a vibratory plate compactor.

H. Protect the underdrain system from damage or displacement, and heavy equipment loads until final grades have been achieved.

PART 4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement and payment of Contract Item 02710.1 UNDERDRAIN SYSTEM shall be made at the contract unit price per linear foot of new underdrain system installed and complete to the lines and grades indicated on the Contract Drawings. This price shall include full compensation for all for all survey; supervision; equipment; labor; materials; pipe (perforated and solid) and fittings; plugs; cleanouts and covers; joint fillers, gaskets, and adhesives; filter stone material; masonry and cementitious materials; handling; storage; excavation; subgrade preparation; installation; pipe placement and connection to existing structures; backfilling; dewatering; compaction; grading; associated modification and repair of existing drainage structures; and any other incidental or appurtenant work required to provide and install the underdrain system, as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work. Measurement for payment shall be by the actual number of horizontal linear feet of pipe including couplings, joints, and connections; completed, accepted, and measured in place along the invert.

B. There shall be no separate measurement and payment for fill materials including but not limited to filter stone, topsoil, concrete, or other earthwork necessary to complete the work of this Section. All earthwork necessary to perform the work of this Contract shall be considered an incidental part of the work items in this and other specification sections unless specifically specified herein.

4.2 PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
02710.1	UNDERDRAIN SYSTEM	LF

END OF SECTION

SECTION 02760

PIPELINE ABANDONMENT

PART 1. GENERAL

1.1 SCOPE

A. The Contractor shall furnish all labor, materials, and equipment and shall perform all work required to locate, access, inspect, cut, partially or fully remove, cap, plug, fill, backfill, abandon, and/or decommission existing pipes and associated structures as indicated on the Contract Drawings.

B. Refer to Specification Section 02065 Demolition, Removal, and Disposal for requirements related to the Work of this Section.

C. Refer to Specification Section 01100 Special Provisions for requirements related to subsurface utility locating and other requirements related to the Work of this Section.

1.2 EXISTING CONDITIONS

A. Record documents indicate that an abandoned, buried, 36-inch Plant Effluent (PE) pipe extends roughly west to east from points within the WPCF property (105 Beacon Point Road, Stratford, CT) crossing below Beacon Point Road and the existing flood protection embankment toward the Housatonic River. The abandoned PE pipe material is assumed to be reinforced concrete (RCP), but has not been confirmed. The conditions and extents of this pipe are unknown.

1. Record documents indicate that the abandoned 36-inch PE pipe crosses the existing Beacon Point Road Alignment at or around approximately Station 18+80 to 18+85 (Refer to Contract Drawings G-101).

2. A proposed schematic representation of the required limits of existing 36-inch PE pipe abandonment is included on Contract Drawings C-102.

3. The intent of the Work is to ensure that the abandoned 36-inch is filled with suitable material to support the proposed improvements and to limit the potential for water to enter the protected side of the proposed flood protection through the abandoned pipe.

B. Record documents and accounts from the Owner indicate that an existing, active, buried, 6-inch water service pipe is located within the proposed limit of disturbance and crosses the proposed alignment to the north of the existing Raw Sewage Pumping Station, Inlet Works, and Generation Building (Refer to Contract Drawings C-102).

1. The Work includes removal and replacement of a limited segment of this water service pipe with new materials as required herein, in accordance with related sections, and as indicated on the Contract Drawings. Refer to Sections 02660 and 02665 for related requirements.

2. The intent of the Work is to remove the existing 6-inch water service line entirely below the proposed floodwall, embankment, riprap, and to the limits indicated on the Contract Drawings and to facilitate the relocation and reconnection of the water service line as required. The resulting water service pipe will provide the same or improved service to the WPCF facility and be located to avoid conflict with the proposed improvements, including but not limited to pile installation and concrete floodwall construction.

3. The Contractor shall be responsible for coordinating their work with the Owner and the water supply company as necessary to maintain continuous water service to the facility. Service interruptions shall be made only with prior approval from the Owner.

4. The Contractor shall be responsible for coordination with others as necessary to locate and reconnect the water service in the vicinity of Existing Vault #2.

C. The 1974 C.E.M. Drawings indicate that a prior perimeter underdrain system was constructed along the protected side (inside) of the levees and dikes from the vicinity of the Beacon Point Road – Birdseye Street intersection, then extending clockwise around the Site to the vicinity of the North Road – South Road intersection (on the west side of the Site). The existing underdrain system is assumed to be constructed of 8-inch diameter asphalt-coated, asbestos-bonded, perforated, corrugated metal pipe. The conditions and extents of this prior, existing underdrain are unknown. The intent of the work is to avoid disturbing the existing underdrain system to the maximum extent practical provided it does not conflict with the proposed improvements.

D. Based on review of record documents and accounts from the owner, an existing drain line appears to cross the existing dike below grade along the Animal Shelter Driveway (south side of the WPCF) in the vicinity of proposed alignment Sta. 28+00 to 28+50. The pipe is assumed to be PVC and extends from an existing concrete vault structure located inside (north) of the existing dike toward a possible drainage structure located within the Public Works Yard to the south.

1. The Work includes the demolition and removal of the existing pipe segment from the existing concrete vault structure (to remain) to the proposed limit of disturbance. Refer to Section 02065 for additional requirements related to the demolition and removal of the existing pipe.

2. The Contractor shall plug the penetration corresponding to the demolished drain pipe in the existing vault to remain and the segment of pipe to remain at the limit of its removal with as required herein and as indicated on the Contract Drawings.

E. The Contactor is advised that other buried structures, pipes, or appurtenances may be present near the pipes proposed for abandonment. The Contractor shall protect all existing structures, pipes, or appurtenances, and other existing site features not scheduled for demolition, removal, or abandonment from damage.

1.3 RELATED SECTIONS

01010	SUMMARY OF WORK
01060	REGULATORY REQUIREMENTS
01100	SPECIAL PROVISIONS
01300	SUBMITTALS
01500	TEMPORARY FACILITIES AND CONTROLS
01560	TEMPORARY EROSION AND SEDIMENT CONTROLS
01566	SUBSURFACE, HYDRAULIC, AND HYDROLIGIC DATA
01740	SITE RESTORATION
01900	MOBILIZATION / DEMOBILIZATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02110	CLEARING, GRUBBING, AND STRIPPING
02300	EARTHWORK
02633	INLINE CHECK VALVES
02660	DUCTILE IRON PIPE AND FITTINGS

02665 VALVES AND APPURTENANCES
02710 UNDERDRAIN SYSTEM
03300 CAST-IN-PLACE CONCRETE

1.4 SUBMITTALS

A. At least two weeks prior to performing any work associated with pipeline abandonment, the Contractor shall submit a Work Plan detailing procedures, equipment, sequences of operations, and schedule to perform the activities called for in this Section and related Sections of this Specification and as indicated on the Contract Drawings. The Work Plan shall include the name, contact information, and qualifications of any subcontractors assisting with or conducting the demolition. The Work Plan submission shall also include descriptions of proposed procedures, product information, and equipment specifications for supporting of excavation sidewalls, bracing or falsework to temporarily support structures being demolished, partially demolished, or abandoned and prepared for improvement or restoration. The Work Plan shall include descriptions of proposed utility coordination, protection, relocation, bypass, service interruptions, pipe and structure abandonment, and other Work of this Section potentially affecting utilities. If necessary, the Work Plan shall also include the name, location, and owner of the off-site disposal facility accepting the demolition debris.

B. At least two weeks prior to planned use, the Contractor shall submit product information and proposed Controlled Density Fill mix designs and supporting documentation that demonstrates the material conforms to the Project Requirements.

C. Refer to Section 02065 Demolition, Removal, and Disposal for related submittal requirements.

PART 2. PRODUCTS

2.1 CONTROLLED LOW STRENGTH MATERIAL (OR CONTROLLED DENSITY FILL)

A. Use controlled low strength material (CLSM) to fill abandoned buried pipes, where CLSM or controlled density fill (CDF) is required, as indicated on the Contract Drawings, and as directed by the Engineer.

B. Controlled Density Fill (CDF) shall be a cement concrete backfill material that flows like a liquid, supports like a solid when cured, and levels without tamping or vibrating.

C. The composition of CDF shall be in accordance with Section M.03 – Portland and Hydraulic Cement Concrete of the State of Connecticut Department of Transportation (CTDOT) Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction - Form 819 (2024), and applicable sections of ACI 229R.

1. CDF shall be proportioned to yield a 52-day minimum compressive strength (f'c) of 200 pounds per square inch (psi) when tested in accordance with ASTM D4832, except where excavatable CDF is required.

2. Excavatable CDF compressive strength shall be between 40 and 80 psi at 52 days when tested in accordance with ASTM D4832 and such that the cured material can be excavated using typical hydraulic excavators.

3. Use No. 8 aggregate consistent with gradation of CTDOT Table M.01.02-2. Maximum aggregate size of ⅜-inch (nominal).

4. Design CDF mix to achieve the necessary strength to support backfilling in accordance with Section 02300 Earthwork with the Contractor's proposed schedule and sequence of Work. Do not use admixtures containing chloride.

2.2 BRICK MASONRY

A. Brick used to plug the ends of pipes or to fill penetrations remaining in buried structures prior to backfilling shall conform to ASTM C32, Grade MS.

B. Mortar used in Brick Masonry to plug the ends of pipes or to fill penetrations remaining in buried structures prior to backfilling shall be pre-blended, pre-packaged, or mixed on Site and meeting the following requirements:

1. ASTM C1714 - Standard Specification for Pre-blended Dry Mortar Mix for Unit Masonry;

2. ASTM C387 - Standard Specification for Packaged, Dry Combined Materials for Concrete and High Strength Mortar; or,

3. Composed of 1 part Portland Cement (or Blended Hydraulic Cement) and 2 parts, by volume of surface dry aggregate blended on Site (CTDOT M.11.04).
   a. Portland Cement shall be Type II conforming to AASHTO M 85.
   b. Blended Hydraulic Cement shall be Type IS conforming to AASHTO M 240.
   c. Fine aggregate for mortar mixed on Site shall conform to CTDOT M.11.04 Grading B.
   d. Hydrated lime shall meet the requirements of ASTM C6 and shall not exceed 4 pounds of lime per 94 pound bag of portland cement.

4. Mixing water shall be potable or otherwise meeting the requirements of CTDOT M.03.01

2.3 CONCRETE

A. Cement concrete used to plug the ends of abandoned pipes or to fill penetrations in buried structures shall be in accordance with Section 03300 Cast-in-Place Concrete.

2.4 NON-SHRINK GROUT

A. Non-Shrink grout used for pipeline abandonment work shall be in accordance with Section 03300 Cast-in Place Concrete.

PART 3. EXECUTION

3.1 GENERAL

A. The work required and services for the pipeline abandonment shall be done in a safe workmanlike manner and shall conform to any pertinent local or state law, regulation or code. Good housekeeping consistent with safety shall be maintained.

3.2 PREPARATORY WORK

A. All water control and sediment and erosion control measures shall be fully in place before beginning the work of this section. Emergency demobilization measures as submitted under Section 01900 shall specifically address protecting and plugging the upstream end of the pipe in the event of rapid increase in the water level or flow.

3.3 DISCONNECTION FOR OTHER UTILITIES

A. No connecting pipes are known, however if found, disconnect the pipes to be abandoned from all other pipes and utilities. The segments of the pipes to be filled must be completely isolated prior to installation of CLSM, CDF, or non-shrink grout fill. Any connecting pipes must be cut and capped or plugged as required. Remove or fully open any valves found upstream of the proposed capping location.

3.4 EXISTING UNDERDRAIN

A. The condition of the existing underdrain system is unknown.

B. Notwithstanding the requirements of other Sections, existing underdrain is intended to remain unless it directly conflicts with an element of the proposed construction or if it appears to penetrate the proposed flood protection system. The Contractor shall notify the Engineer of any conflicts anticipated or encountered, as required.

C. Where the existing underdrain system is found to be in direct conflict with the work or, if in the opinion of the Engineer, the existing underdrain appears to be damaged or otherwise presents an unsuitable condition, the Contractor shall remove the minimum length of pipe necessary to enable the work and plug the pipe to remain at the limit of removal. Existing pipe removed by the Contractor shall become the property of the Contractor and shall be removed from the Site and lawfully disposed of in accordance with Section 02065. There shall be no separate measurement and payment for this work, which will be considered incidental to the Contract Items for which removal of the existing underdrain is necessary or otherwise required.

3.5 CUTTING AND CAPPING DUCTILE IRON PIPE

A. Material shall meet the requirements of Section 02660.

B. Cap the upstream pipe segment to remain (if any) when appropriate as part of the limited removal and replacement of the existing 6-inch water service line.

3.6 PIPELINE PLUGGING

A. To ensure a closure of intact pipe segments to remain and isolation of the pipe segment(s) to be filled, use cement masonry or other bulkhead suitable for the pipeline to provide a water-tight seal at the limit of pipe line removal, upstream and downstream ends of the proposed fill capable of resisting grout pressures. Approved mechanical plugs or inflatable packers may be substituted at the Contractor's option for the bulkhead. Alternative methods to confine the CLSM, CDF, or non-shrink grout, such as addition of vertical pipe sections may be allowed.

B. Use CLSM, CDF, or non-shrink grout to fill the entire length of pipe remaining after cutting. No voids or air pockets shall remain within the plug volume of the pipe after the work is complete. If feasible, suitable provision for air venting of the plug volume shall be provided to provide for complete filling. Grouting by gravity is preferable, but in no instance, shall grouting pressures exceed 20 pounds per square inch.

C. Backfill excavations in accordance with Section 02300 after bulkheads and cementitious fill materials have achieved sufficient strength to resist construction loading.

PART 4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement and payment of Contract Item 02760.1 36-INCH EFFLUENT PIPE ABANDONMENT shall be made at the contract lump sum price to perform the corresponding pipe abandonment work to the limits indicated on the Contract Drawings and as required herein. This price shall include full compensation for all for all survey; supervision; equipment; labor; materials; masonry and cementitious materials; handling; storage; excavation and excavation support; installation; bulkhead and plug construction; backfilling; dewatering; compaction; grading; associated modification and repair of existing structures to remain; and any other incidental or appurtenant work required to plug, fill, and abandon the proposed segment of existing 36-inch Effluent Pipe, as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work. No measurement shall be made for payment of this item. Payment shall be made at the contract lump sum price for the Work of the item completed, in-place, and accepted.

B. There shall be no separate measurement and payment for fill materials including but not limited to CLSM, CDF, non-shrink grout, cast-in-place concrete, masonry, or other earthwork necessary to complete the work of this Section. The materials and labor necessary to perform the work of this Contract shall be considered an incidental part of the work items in this and other specification sections unless specifically specified herein.

C. There shall be no separate measurement and payment for other pipeline abandonment work referenced in this section and incidental to the completion of other items.

4.2 PAYMENT ITEMS

A. Payment for the scope of the work specified herein, including all labor, materials, equipment, and incidentals and mobilization/demobilization costs associated with the access, cutting, removal, and abandonment of pipelines, as well as other work incidental to the items listed below including excavation, backfill, and plugging and filling of remaining pipes and structure penetrations. Work incidental to these items shall be paid for at the applicable unit price stated on the Bid Form.

ITEM NO.	PAYMENT ITEM	UNIT
02760.1	36-INCH EFFLUENT PIPE ABANDONMENT	LUMP SUM

END OF SECTION

SECTION 02820

CHAIN LINK FENCE AND GATES

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, equipment, materials, tools, and accessories to complete the Work of this Section. The Work of this Section includes but is not limited to:

1. Demolition, removal, and temporary removal of certain chain link fence and gate segments as indicated on the Contract Drawings.
2. Provision, erection, and maintenance of temporary fencing and barricades to maintain continuity and function of perimeter fencing and gate access throughout the project until the new fences and gates are installed, complete, and accepted by the Owner.
3. Restoration or in-kind replacement or relocation of certain existing chain link fence and swing gate segments as indicated on the Contract Drawings.
4. Modification, continuation, and connection or reconnection of existing and proposed chain link fence segments to accommodate proposed improvements such as relocated fence lines and proposed concrete flood wall segments.
5. Construction of chain link fence and swing gate segments at the locations, dimensions, and conditions indicated on the Contract Drawings.
6. Coordination of fence removal, temporary fencing, and new fence installation with the Owner and WPCF Facility Staff.
7. Removal and off-site disposal of all unsuitable and excess materials that will not be incorporated into the completed project.

1.2 RELATED SECTIONS

01010	SUMMARY OF WORK
01050	FIELD ENGINEERING
01300	SUBMITTALS
01500	TEMPORARY FACILITIES AND CONTROLS
01560	TEMPORARY EROSION AND SEDIMENT CONTROLS
01566	SUBSURFACE, HYDRAULIC, AND HYDROLOGIC DATA
01740	SITE RESTORATION
01900	MOBILIZATION / DEMOBILIZATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02110	CLEARING, GRUBBING, AND STRIPPING
02300	EARTHWORK
02373	RIPRAP
02510	BITUMINOUS CONCRETE PAVEMENT
02820	CHAIN LINK FENCE AND GATES
03300	CAST-IN-PLACE CONCRETE
05500	MISCELLANEOUS METALS

1.3 REFERENCE STANDARDS

A. References herein to any technical society, organization, group or body 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:

1. ASTM: American Society for Testing and Materials
2. OSHA: Occupational Safety and Health Administration
3. AASHTO: American Association of State Highway Transportation Officials
4. CTDOT: Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction - Form 819 (2024)

1.4 SUBMITTALS

A. Submit a description of procedures, equipment, and schedule including but not limited to proposed phasing for the removal of existing fencing, installation of new fencing, and temporary fencing measures.

B. Submit manufacturer's literature and product data for each product to be used including but not limited to:

1. Material specifications and properties in accordance with the project requirements.
2. Storage and handling requirements.
3. Preparation instructions and recommendations.
4. Installation methods.

C. Shop Drawings:

1. Submit shop drawings detailing applicable plan, section, and elevation views of each component specified.
2. Coordinate the locations of components with the Contract Drawings.
3. Provide details, where required, for connection of new fence or gate to existing fence or gate segments and to the reinforced concrete flood wall. No fence or gate posts shall be embedded in the concrete pile cap for the flood wall.

D. Selection Samples: For each finish product specified, submit two complete sets of color chips representing the manufacturer's full range of available colors, texture, sheen, pattern, or other finish characteristics for review and selection by the Owner.

E. Verification Samples: For each finish product selected, submit samples representing the actual product and selected finish.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years of experience.

B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Finish areas designated by Engineer.

2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Engineer.

3. Refinish mock-up area as required to produce acceptable work.

D. Reuse of existing fence fabric, posts, gates, and other related accessories and hardware shall be permitted provided the materials are protected from damage, are of the same quality and compatible with the new components per the manufacturer's recommendations, and instances of component or coating damage are repaired to the satisfaction of the Owner.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle new products in manufacturer's unopened packaging until ready for installation. Handle all hot-dipped galvanized and PVC coated products with care. If coatings are damaged during handling and installation, the Contractor shall repair or replace the damaged materials at their own expense.

B. Protect and store existing products recovered from fence demolition activities on site in a manner that will avoid additional damage or deterioration.

C. The Contractor shall dispose of all fence and gate components not used in the work and provide replacement fence and gate components meeting the requirements of new fence components indicated herein.

D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

E. Dispose of all unsuitable and excess materials generated from the work of this Section in accordance with Section 02065 – Demolition, Removal, and Disposal.

1.7 WARRANTY

A. At project closeout, provide an executed copy of the Manufacturer's Limited Warranty outlining its terms, conditions, and exclusions for a duration of 15 years.

PART 2. PRODUCTS

2.1 GENERAL

A. All chain link fence and gate materials shall be black, polyvinyl chloride-coated steel, with top rail to match existing fence and gate segments to remain, as indicated on the Contract Drawings, and meeting the requirements of CTDOT Section M.10.05 – Chain Link Fence, except as modified herein.

B. Guage measurements of finished wire shall be in United States Steel Wire Guage or equivalent.

C. Tolerance for wire sizes shall meet the requirements of AASHTO M 181.

D. Chain link fence and gates components shall be of the same type, coating, and finish.

E. Provide all chain link fence and gate components in sufficient quantities to complete the work in accordance with this Section and as indicated on the Contract Drawings.

2.2 TEMPORARY FENCING

A. Provide temporary fencing and accessories in accordance with Section 01500 – Temporary Facilities and Controls.

2.3 FABRIC

A. Polyvinyl chloride-coated (PVC-coated) steel chain link fence fabric meeting the requirements of ASTM F668, Class 1; 9-gauge core wire (0.148-inch nominal diameter). Woven to form a continuous fabric having a 2-inch mesh. Knuckled finish on top and bottom edges. Height shall be 72 inches or as indicated on the Contract Drawings.

2.4 METAL POSTS, RAILS, BRACES, AND GATE FRAMES

A. Hot-dipped galvanized steel pipe meeting the requirements of ASTM F1083 High Strength Grade Schedule 40 and ASTM F1043 Group 1A-2. Hot-dipped galvanized with a zinc coating weighing not less than 2.0 ounces per square foot when tested in accordance with AASHTO T 65 and shall be in accordance with AASHTO M 181, Grade 2.

B. Gate frames shall be shop-fabricated with continuously welded connections, prior to hot-dip galvanizing or with zinc coating repaired, prior to PVC-coating application. Unless noted otherwise the diameter of the pipe used to construct the gate frames shall be 1⅞ inches (nominal).

C. At minimum, the outer hot-dipped galvanized surface shall be coated with the same PVC coating as the chain link fabric mesh.

D. Posts shall be straight, true to section and of sufficient length to enable post to be encased for a depth of 3 feet into a concrete footing. All posts shall receive hot-dipped galvanized and PVC-coated metal caps to match the posts, domed or looped as indicated on the Contract Drawings.

E. All chain link fences shall include top rails, and brace rails in accordance with this specification and as indicated on the Contract Drawings.

F. Provide gate stop drop pins and associated hardware as indicated on the Contract Drawings for double gates.

2.5 FITTINGS

A. Post caps, rail ends, tension and brace bands, gate hinges, latches, and connection hardware: Malleable iron or pressed steel, hot-dipped galvanized in accordance with ASTM A153, and PVC coated to match the posts and fabric.

B. Top Rail Sleeves: ASTM F626; pressed steel or round steel tubing hot-dipped galvanized and PVC coated to match the other fence components.

2.6 TENSION WIRE, TIE WIRE, AND HOG RINGS

A. Tension Wire: ASTM F1664, Class 1; 7-gauge, zinc-coated, steel core wire, PVC-coated to match fence fabric mesh.

B. Tie Wire and Hog Rings: ASTM F626; 9-gauge, zinc-coated, steel core wire, PVC-coated to match fence fabric mesh.

2.7 OTHER HARDWARE AND FASTENERS

A. Fasteners and specialty hardware to connect fence and gate segments to the face of the reinforced concrete floodwall sections shall be hot-dipped galvanized steel in accordance with Section 05500 – Miscellaneous Metals. Concrete anchors shall be post-installed (drilled) and set in epoxy adhesive in accordance with Section 03300 – Cast-in-Place Concrete.

B. Provide additional hardware as required to complete the work as required herein, as indicated on the Contract Drawings, and in accordance with the fence manufacturer's recommendations.

2.8 CONCRETE FOOTINGS AND GATE STOPS

A. Cast-in-place portland cement concrete, with a minimum compressive strength of 3,300 psi at 28 days in accordance with CTDOT M.10.05. Refer to Section 03300 for related requirements.

B. Non-shrink grout for posts grouted into rock shall be pre-bagged, pre-blended hydraulic cement grout in accordance with ASTM C1107 and CTDOT M.03.05, mixed with potable water, and achieving a minimum compressive strength of 5,000 psi at 28 days. Refer to Section 03300 for related requirements.

PART 3. EXECUTION

3.1 EXAMINATION

A. Do not begin installation until all substrates have been properly prepared.

B. Report all unsatisfactory preparations and conditions to the Engineer before proceeding with new fence installation.

3.2 REMOVAL OF EXISTING FENCES AND GATES

A. The removal of existing chain link fences and gates may be phased or sequenced to accommodate the Contractor's schedule of construction.

B. Maintain the continuity and function of existing fences and gates impacted by the Work throughout the duration of construction. The Contractor shall provide, install, adjust, and maintain suitable temporary chain link fence and gate panels or approved equivalent devices to maintain the continuity and function of the existing fences and gates, from the time of removal and until permanent fence restoration and improvements are complete and the work is accepted by the Owner. **Refer to Section 01500 – Temporary Facilities and Controls for Temporary Fencing and related requirements.**

C. Remove existing chain link fence, gates, concrete foundations, and other accessories located within the limits of existing fence removal or temporary removal as indicated on the Contract Drawings and to the nearest existing fence post to remain that does not conflict with the proposed work.

D. Perform all necessary excavation to complete the removal of the existing fences, backfill, and restore grades to the disturbed areas in accordance with Section 02300 – Earthwork.

E. Existing fence and gate components that are undamaged and otherwise meet the requirements for new materials, to the satisfaction of the Engineer, may be salvaged and reused by the Contractor to complete the new fence installations.

F. Unsuitable and excess materials not used to complete the work shall be removed from the Site and disposed of by the Contractor in accordance with Section 02065 – Demolition, Removal, and Disposal.

G. Modify and protect the existing chain link fence fabric and posts at the limit of removal as required and in accordance with the fence manufacturer's instruction to support connection or reconnection of new and relocated fences.

3.3 PREPARATION

A. Clean all surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the fence and gate manufacturer for achieving the best result under the project conditions.

C. Complete all other Work in advance of proposed fences and gates that may interfere with the Work of this Section.

D. Remove fence posts and associated concrete foundations (including remnants), backfill, and restore finished grade at all existing and new post hole locations not used to complete the work.

3.4 INSTALLATION

A. Install all fence and gate components in accordance with the manufacturer's recommendations and as indicated on the Contract Drawings.

B. Coordinate fence height, connections, gates, and other features and locations with the Contract Drawings and approved shop drawings.

C. Drill and set concrete anchors in epoxy grout, where required, in accordance with Section 03300 – Cast-in-Place Concrete.

D. Crown the top surface of concrete foundations and gate stops slightly to limit potential accumulation of water.

3.5 PROTECTION AND REPAIR

A. Protect all products from damage until the completion of the project.

B. Touch-up, repair, or replace damaged products prior to providing notice of substantial completion, as required herein, and to the satisfaction of the Engineer and Owner.

3.6 CLEANUP

A. Clean and remove all remaining residues from the new fence and gate components. Remove all waste, debris, and unused materials from the Site.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Measurement and payment for Contract Item 02820.1 CHAIN LINK FENCE AND GATE – REMOVAL shall be made at the contract unit price per linear foot of existing chain link fences and gates removed, temporarily stored on-site, and/or disposed of by the Contractor, as required, and to the limits indicated on the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; excavation and backfill; cutting; removal of fence posts, foundations, gates, chain link fabric and accessories; off-site disposal; protection; repair; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

B. Measurement and payment for Contract Item 02820.2 CHAIN LINK FENCE RESTORATION AND IMPROVEMENT shall be made at the contract unit price per linear foot of chain link fence restored, installed, and complete to the locations and conditions indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; shop drawings and product selection; excavation and backfill; coated fence fabric, posts, top and bracing rails, other rails, tension wire, tie wires, hog rings, post caps, fittings, ties and other fencing hardware; fasteners; anchors; connections; modifications necessary to connect existing fences to remain to relocated fences; cast-in-place concrete foundations; non-shrink grout; repair; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

C. Measurement and payment for Contract Item 02820.3 CHAIN LINK GATE - SINGLE shall be made at the contract unit price per each of single metal chain link gates, 4 to 8 feet wide, restored, installed, and complete to the locations and conditions indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; shop drawings and product selection; excavation and backfill; coated fence fabric, posts, top and bracing rails, other rails, tension wire, tie wires, hog rings, post caps, fittings, ties and other fencing hardware; fasteners; anchors; connections and modifications; cast-in-place concrete foundations; non-shrink grout; repair; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

D. Measurement and payment for Contract Item 02820.4 CHAIN LINK GATE - DOUBLE shall be made at the contract unit price per each of double metal chain link gates, corresponding to openings of 24 feet wide or less, restored, installed, and complete to the locations and conditions indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; shop drawings and product selection; excavation and backfill; coated fence fabric, posts, top and bracing rails, other rails, tension wire, tie wires, hog rings, post caps, fittings, ties and other fencing hardware; fasteners; anchors; connections and modifications; gate stop and drop pin; cast-in-place concrete foundations; non-shrink grout; repair; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

E. There shall be no separate measurement and payment for the provision, use, and removal of temporary fencing required which shall be considered incidental to the work of this Section and related Sections and included in the cost of payment items included in the contract.

4.2 PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
02820.1	CHAIN LINK FENCE AND GATE – REMOVAL	LINEAR FOOT
02820.2	CHAIN LINK FENCE RESTORATION AND IMPROVEMENT	LINEAR FOOT
02820.3	CHAIN LINK GATE - SINGLE	EACH
02820.4	CHAIN LINK GATE - DOUBLE	EACH

END OF SECTION

SECTION 02840

VEHICLE GUIDE RAILS

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, equipment, materials, tools, and accessories to complete the Work of this Section. Work under this section shall consist of the limited removal of a segment of existing vehicle guide rail and installation of terminal vehicle guide rail segments at each end of the removal, including all incidental work as required, as indicated on the Contract Drawings, and as directed by the Engineer.

1.2 RELATED SECTIONS

01010	SUMMARY OF WORK
01300	SUBMITTALS
01500	TEMPORARY FACILITIES AND CONTROLS
01740	SITE RESTORATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02300	EARTHWORK
03300	CAST-IN-PLACE CONCRETE
05500	MISCELLANEOUS METALS

1.3 REFERENCES

A. References herein to any technical society, organization, group or body 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:

1. State of Connecticut Department of Transportation - Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction – Form 819 – 2024 (CTDOT)

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten (10) years of experience.

B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.

1.5 SUBMITTALS

A. Submit a description of installation procedures and equipment to be used for post and guide rail installation.

B. Submit a description of products and procedures to temporarily secure and protect to the working ends of existing and proposed guide rail during construction and prior to completion of the work. Products

and procedures shall be in accordance with industry standards, CTDOT Section 9.12, Section 01500 related sections of these Specifications, as required, and as indicated on the Contract Drawings.

C. Submit product information, manufacturer's literature, and instructions for all products used to complete the Work of this Section and shop drawings for any metal fabrication.

1. Indicate all pertinent information including but not limited to profiles, shapes, grades, finishes, dimensions, sizes, connections, attachments, welding, size and type of fasteners, size and locations of holes, coatings, and accessories.

2. Indicate locations, quantities, storage and handling requirements, methods of assembly, anchorage and connections to other members, and installation and maintenance requirements.

D. Submit supplier information, material and mill test reports, and manufacturer's test reports and data demonstrating materials and fabrications supplied for use in the Work conform to the Project Requirements, as required herein and under related Specification Sections, and as indicated on the Contract Drawings.

PART 2. PRODUCTS

2.1 GENERAL

A. All products shall be as specified herein, unless noted otherwise, and as indicated on the Contract Drawings.

B. Refer to Section 05500 – Miscellaneous Metals for related requirements.

2.2 EXISTING MATERIALS

A. Reuse any undamaged rail elements, appropriate posts, delineators, and lap bolts salvaged from the segments of existing guide rail within the limits of existing guide rail demolition and removal indicated on the Contract Drawings to convert and install the new terminal sections.

B. Use new materials when any components of the existing guide rail are damaged, missing, or cannot be obtained from the segment of existing guide rail within the limits of existing guide rail demolition and removal indicated on the Contract Drawings.

C. Unsuitable or excess existing materials generate from the existing guide rail removal shall become the property of the Contractor and shall be disposed of in accordance with Section 02065 – Demolition, Removal, and Disposal.

2.3 NEW MATERIALS

A. Provide all required new materials to convert the existing vehicle guide rail and install new R-B Terminal Sections meeting the requirements of and in accordance with CTDOT Sections 9.10, 9.11, 9.12, M.10.02, and related sections; as required herein; and as indicated on the Contract Drawings.

B. Steel Posts, Shapes, Tube, Plates, Washer Plates, Square Washers, Welded-Soil Plates, Brackets, Back-Up Rails, and Channel Rubrails shall meet the requirements of ASTM A36; hot-dip galvanized ASTM A123 after fabrication.

1. All welding shall meet ANSI/AASHTO/AWS D1.5.

C. Rail Elements (W-Beam, Thrie-Beam) and Terminal Sections shall meet the requirements of AASHTO M 180 and the following:

1. Steel sections shall be Class A, unless noted otherwise on the Contract Drawings:

a. Class A (12 gauge): base metal nominal thickness of 0.105 inch

b. Class B (10 gauge): base metal nominal thickness of 0.135 inch

2. Galvanizing shall be Type II.

3. Acceptance shall be based on AASHTO M 180 Article 5.3 "Acceptance by Brand Registration and Guarantee."

4. Rail elements with radii less than or equal to 150 feet, as shown on the plans, shall be shop fabricated and then permanently stamped or embossed with the designated radius (R = _____) on the element near the brand registration stamp.

D. Steel Bolts, Washers, and Nuts:

1. Anchor bolts and rods for attachment to barriers and parapets shall meet ASTM A449.

a. Nuts: ASTM A563, Grade B.

b. Washers: ASTM F436.

2. All other bolts and nuts, unless otherwise noted on the plans, shall meet the requirements of ASTM A307.

3. All bolts, nuts and washers, unless otherwise noted on the plans, shall be galvanized after fabrication to meet the requirements of ASTM F2329.

E. End Anchorages:

1. Bar reinforcement meet the requirements of CTDOT M.06.01-1.

2. Concrete shall meet the requirements of Class PCC03340 Concrete in accordance with CTDOT M.03.

3. Anchor bolts and rods for end anchorages shall meet the requirements of AASHTO M 314.

F. Zinc dust-zinc oxide paint for galvanized coating touchup shall meet the requirements of AASHTO M 180.

G. Plastic blockouts shall be made with a minimum of 50% recyclable polyethylene plastic comprised of low-density and high-density polyethylene with a specific gravity less than or equal to 1.0 in accordance with ASTM D792 and be recyclable. They shall also have a minimum compressive stress of 450 psi in accordance with ASTM D695, meet the dimensions indicated on the plans, and be a shade of gray or black. Blockouts must have been crash-tested and have approval in writing by the FHWA in compliance with MASH, Test Level 3 requirements. Each blockout shall be stamped at the factory with the manufacture's identification and lot number. The Contractor shall furnish to the Engineer prior to construction a Certified Test Report and a Materials Certificate for the blockouts in conformance with CTDOT Sections 1.06.07 or 1.20-1.06.07.

H. Wood posts shall be commercial lumber Grade No. 1 or better and shall meet AASHTO M 168. The posts shall be either rough sawn (non-planed) or S4S (surface four sides) southern yellow pine or douglas fir, or western larch with nominal dimensions as indicated on the plans. Actual dimensions of the posts shall not vary by more than 1/4 inch from the dimensions shown on the plans. After all end cuts are made

and all holes are drilled the wood shall be treated in accordance with AASHTO M 133 and the AWPA Standards.

PART 3. EXECUTION

3.1 PREPARATION

A. Remove all existing guide rail elements, posts, and anchorage (as applicable) in their entirety to the limits of removal indicated on the Contract Drawings. Backfill all post holes and incidental excavations and restore grade in accordance with Section 02300 – Earthwork.

B. Prior to any guide rail removals or installations, the Contractor shall submit to the Engineer for review its proposed methods for temporarily terminating the end section. Protect and secure the working ends of the existing and proposed guide rail per the reviewed submittal.

3.2 INSTALLATION

A. Steel posts shall be driven with suitable equipment. Where obstructions are encountered, excavate and remove the obstruction as necessary to permit driving of the post. Backfill the excavation with suitable material and compact the backfill in accordance with Section 02300 – Earthwork prior to driving the post.

B. Wood Posts (and steel post sleeves) shall be set into holes and backfilled in accordance with Section 02300 – Earthwork.

C. Complete the new guide rail terminal end section installation in accordance with the product manufacturer's instructions, in accordance with CTDOT Section 9.10, and as indicated on the Contract Drawings.

D. Touch up damaged galvanized coating as required.

E. Remove any remaining excess and unsuitable materials and restore areas of disturbance in accordance with Section 01740 – Site Restoration.

3.3 DEFECTIVE WORK

A. Any item installed in an unsafe manner or condition, not meeting industry standards, not in accordance with the Contract Documents, that does not function or fit as intended or is not complete and finished to the satisfaction of the Owner and Engineer.

B. Defective work and component items shall be repaired or replaced to meet the Project Requirements to the satisfaction of the Owner and Engineer, at no additional cost to the Owner.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Measurement and payment for Contract Item 02840.1 GUIDE RAIL REMOVAL shall be made at the contract unit price per linear foot of vehicle guide rail removed and disposed of by the Contractor, as required, and to the limits indicated on the Contract Drawings. This price shall include full compensation

for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; excavation and backfill; cutting; removal and disposal of metal and wood rail posts, guide rail beams, foundations, anchorage, and accessories; protection; repair; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

B. Measurement and payment for Contract Item 02840.2 R-B TERMINAL SECTION (GUIDE RAIL) shall be made at the contract unit price per each of R-B Terminal Sections of vehicle guide rail installed, and complete to the locations and conditions indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; shop drawings and product selection; excavation and backfill; galvanized steel posts, post sleeves, W-Beam rail (straight and radii segments), rounded end sections, plates, channels, fasteners, anchorage, and any other guide rail hardware or accessories; wood/timber posts; adhesives; plastic blockouts; connections, transitions, conversions, and modifications; repair; touchup; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

4.2 PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
02840.1	GUIDE RAIL - REMOVAL	LINEAR FOOT
02820.2	R-B TERMINAL SECTION (GUIDE RAIL)	EACH

END OF SECTION

SECTION 02930

LOAMING, SEEDING, AND REVEGETATION

PART 1. GENERAL

1.1 DESCRIPTION

A. The Work under this Section includes the furnishings of all labor, equipment, supplies and materials for loaming, seeding, revegetating, and related items, as indicated on the drawings and/or as specified herein as follows:

1. Loam (topsoil)
2. Seeding
3. Fertilizing
4. Temporary Erosion Protection
5. Maintenance

B. The Work of this Section covers loaming and seeding operations, as well as prior preparation and subsequent conditioning (fertilizer and erosion protection) and maintenance, at all locations where fill is placed, excavations made, or existing vegetation is disturbed, and no other finish or restorative treatment in proposed (e.g., riprap, pavement, floodwall, crushed stone pads, etc).

C. The performance of this work shall be judged by the establishment of appropriate ground cover in the indicated areas. The Contractor shall be responsible for the watering, mowing, and other proper care of the seeded areas until final acceptance.

D. Topsoil stockpiled and screened under other Sections may be used as loam, but the Contractor shall furnish additional loam at his/her own expense if required. The Contractor shall supply acceptable weed-free loam from off-site sources.

E. In general, the work shall consist of all loaming, seeding, and revegetation necessary to prepare all areas on the site for revegetation, placing, seeding with approved seed mix, conditioning and fertilizing the soil as required, protecting the area from erosion through the use of mulch or biodegradable blankets, and maintaining the seeded areas (watering, etc.) until the grass, turf, lawn, ground cover, or other vegetation is well established. The Contractor shall be responsible for all maintenance and repair of loam and seeded areas until final acceptance.

F. The Contractor shall loam, seed, and revegetate all areas where construction shall take place as shown on the Contract Plans, as well as any other areas necessary for the work of the Contract (with approval from the owner). The Contractor shall perform ALL necessary loaming, seeding, and revegetation at all locations on the site.

1.2 SCOPE OF WORK

A. The Work of this Section shall consist of establishing vegetation, including the provision of, handling, placement, grading, shaping, conditioning, and fertilizing of on-site stockpiled topsoil or loam from approved, weed-free off-site sources, in the unexpected event that off-site material is needed, to all

areas where fill is placed, excavations made, or existing vegetation is disturbed. The typical final thickness of the loam layer shall be six (6) inches.

B. The Work of this Section shall include the seeding of loamed areas with approved seed mix, protecting the area from erosion through the use of mulch or biodegradable blankets, and maintaining the seeded areas (watering, maintenance seeding, etc.) until the grass or other vegetation is well established.

C. The Contractor shall loam, seed and revegetate all areas where construction shall take place as shown on the Contract Plans, as well as any other areas necessary for the work of the Contract (with approval from the Owner). The basic scope of each loaming, seeding and revegetation area is discussed below; however, the Contractor is informed that these divisions in no way relieve the Contractor of his obligation to perform ALL necessary loaming, seeding, and revegetation at all locations on the site during all phases and stages of the project, irrespective of the basic descriptions provided below:

Loaming, seeding, and revegetation shall be performed at all areas where clearing, grubbing, stripping, and/or tree removal is performed; all construction access, storage, staging, and laydown areas; and all other areas disturbed by construction activity for which no other finish or restorative treatment is proposed (e.g., riprap, pavement, floodwall, crushed stone pads, etc), as indicated on the Drawings, as required, and as directed by the Engineer and/or Owner.

1.3 RELATED SECTIONS

01010	SUMMARY OF WORK
01060	REGULATORY REQUIREMENTS
01100	SPECIAL PROVISIONS
01110	ENVIRONMENTAL PROTECTION PROCEDURES
01500	TEMPORARY FACILITIES AND CONTROLS
01560	TEMPORARY EROSION AND SEDIMENT CONTROLS
01740	SITE RESTORATION
01900	MOBILIZATION / DEMOBILIZATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02110	CLEARING, GRUBBING, AND STRIPPING
02300	EARTHWORK

1.4 PROTECTION OF WETLANDS AND WATERWAYS

Because the project is located adjacent to inland and coastal wetlands and the Housatonic River, it is critical that no fertilizers or other chemicals be allowed to reach open water or stream areas. No fertilizers shall be applied to areas below normal water surface elevation. DO NOT over-fertilize and take care that runoff containing fertilizer does not enter downstream channels. NO herbicides, pesticides, or similar chemicals are allowed at the site. Fertilizers must be approved prior to application and shall not contain herbicides or pesticides.

1.5 SUBMITTALS

The Contractor shall submit to the Owner for review and approval, the following information a minimum of eight (8) days in advance of starting any loaming, seeding, and revegetation operations:

A. Composition, test data as specified herein, and Manufacturer's information or source of following material:

1. Soil Chemistry Test Results
2. Loam (topsoil) material
3. Seed (including certification of weed content)
4. Limestone
5. Fertilizer
6. Compost
7. Mulch and/or Erosion Protection Blanket material.

PART 2. PRODUCTS

2.1 LOAM

A. Loam (topsoil), stripped, screened and stored on-site as specified in Section 02110, shall meet the requirements of this Section and be approved by the Owner before reuse. If the topsoil does not meet the specified criteria below, or if sufficient quantities are not available on-Site to complete the work as required, then suitable loam from outside sources shall be furnished by the Contractor.

B. Loam, shall consist of loose, friable, sandy loam, or loam, free of admixture of subsoil, refuse, stumps, rocks, brush, weeds and other materials which will prevent the formation of a suitable seed bed. No stones in excess of one and one-quarter inch (1¼") in diameter will be tolerated. The soils shall conform to the following gradation:

Sieve Size	Percent Finer by Weight
1-inch	90 to 100%
No. 4	70 to 95%
No. 40	30 to 85%
No. 100	25 to 50%
No. 200	20 to 40%

(No more than 15 percent of loam shall be clay)

The loam shall contain at least 10 percent, but not more than 20 percent, organic material as determined by the loss during ignition of oven-dried samples. Test samples shall be dried to a constant weight at a temperature of 221 degrees F $\pm$ 5°F. Loam shall be amended with well-cured compost as necessary to achieve minimum 10 percent organic content.

Loam shall not have greater than 500 parts per million salt.

The Contractor shall notify the Owner of the location of the source of supply for the loam at least ten days prior to delivery of the loam to the project site. Any imported materials which do not meet the above requirements shall be rejected and removed from the site.

C. Testing Requirement

1. All loam (topsoil) shall, at the Contractor's expense, be subjected to a Standard Soil Test with Organic Matter which shall include reporting of the following parameters: pH, Buffer pH, Extractable Nutrients, Extractable Heavy Metals (e.g. Lead), Cation Exchange Capacity, Percent Base Saturation, Percent Organic Matter, and Total Soil Nitrogen. The laboratory test results shall provide recommendations for nutrient and pH adjustments.

2. A minimum of one test shall be performed on each distinct loam (topsoil) source. A standard soil test shall be performed for every 500 CY of loam used at the site.

3. Soil testing shall be performed at the University of Connecticut Soil Nutrient Analysis Laboratory or other approved accredited testing laboratory.

4. Laboratory analytical testing for contaminants as specified in Section 02300 shall be performed.

2.2 COMPOST

A. Compost mature and well cured (4-6 months curing after completion of thermophillic compost process) and moderately screened. It shall have a moisture content that results in no visible free water or dust produced when handling the material.

B. Compost shall meet the following criteria:

	Minimum	Maximum
Percent passing 2"	100%	--
Percent passing 1"	90%	100%
Percent passing ¾"	70%	100%
Percent passing ¼"	4%	75%

C. Compost pH shall be between 6.0 and 8.5. Manufactured inert material (plastic, metal, etc) shall be less than 0.5 percent on a dry weight or volume basis, whichever provides the least amount of foreign material. Minimum organic matter shall be 40 percent by dry weight basis as determined by Loss-On-Ignition Matter Method. Soluble salt contents shall be less than 6.0 mmhos/cm. The compost shall be composed of a minimum of 65 percent by volume recycled plant waste. A maximum of 35 percent by volume of other approved organic waste and/or biosolids may be substituted for recycled plant waste. The supplier shall provide written verification of feedstock sources.

D. Compost shall be certified free of herbicides and other harmful chemicals.

2.3 SEED

A. Seed shall be the commercial product of a reputable grower approved by the Owner and shall be certified to be not more than one (1) year old. Seed mixes provided by New England Wetlands Plants, Inc. (NEWPI) or other approved grower/vendor and optimized for the on-site conditions shall be applied where shown on the Contract Plans. The seed mix proposed for use shall be the New England Erosion Control/Restoration Mix for Dry Sites or equivalent. Plant species typically provided as follows:

Creeping Red Fescue (Festuca rubra), Annual Rye-grass (naturalized)(Lolium multiflorum), Little Bluestem (Schizachyrium scoparium), Indian Grass (Sorgastrum nutans) Upland Bentgrass (Agrostis perennans), Rough Bentgrass/Ticklegrass (Agrostis scabra), Blue Grama (Bouteloua gracilis), Canada Wild Rye (Elymus canadensis), Perrenial Ryegrass (naturalized)(Lolium perenne).

B. The loading rate shall be 1 pound of New England Erosion Control/Restoration Mix for Dry Sites per 1,250 square feet of seed area or the manufacturer's recommended application rate, whichever is greater.

C. Other seed mixes may be utilized subject to prior approval by the Owner.

D. The seed shall be furnished and delivered premixed in the proportions specified above. All seed shall comply with applicable State and Federal seed laws. A grower's certificate of compliance with the specifications shall be submitted by the grower with the shipment of the seed. The certificate shall include the guaranteed percentage of purity, weed content and germination of the seed, and also the net weight and date of shipment. No seed shall be sown until the Contractor has submitted the certificate to the Owner.

2.4 FERTILIZER

Fertilizer shall be furnished in containers plainly marked with chemical analysis of the product and showing one of the following compositions by weight:

	(1)	(2)	(3)
Nitrogen	10% min.	8% min.	7% min.
Available Phosphoric Acid	6% min.	6% min.	7% min.
Water Soluble Potash	4% min.	4% min.	7% min.

At least 50 percent by weight of the nitrogen content of the fertilizer shall be derived from organic materials.

2.5 LIMESTONE

Limestone shall consist of pulverized limestone obtained by grinding either calcareous or dolomitic limestone so that ninety-five percent (95%) of the material will pass a No. 20 sieve and at least fifty percent (50%) shall pass a No. 100 sieve, and shall have a satisfactory neutralizing value.

2.6 EROSION CONTROL BLANKETS

A. Erosion control blankets shall be appropriate for use on slopes where mulch is not stable. The erosion protection blankets shall be for temporary application and shall be biodegradable and non-toxic. Materials such as jute, coir fiber, and mattresses with straw matrices are judged acceptable, provided no other unsuitable material is included. All erosion control products should be new and previously unused and free of weed and other undesirable seeds. The purpose of these materials is to provide temporary erosion control during the period of establishment of the underlying grass. The blankets shall allow for the growth of grass seeded under the blankets.

B. Erosion control blankets anchors shall be compatible with the blanket material and shall be of wooden or other biodegradable material.

2.7 MULCH

A. Mulch used in this project shall be straw free from weeds or coarse matter. A sample shall be submitted. Hay mulch shall not be allowed.

B. Woodchip mulch may also be used. Woodchip mulch may be made from timber cleared from the site.

C. Special care shall be taken to insure that mulch imported to the site is free from invasive wetland species seeds or plant matter.

PART 3. EXECUTION

3.1 LOAM

A. Loam (topsoil), shall be amended in accordance with the recommendations of the Testing Laboratory provided in their report and in accordance with these specifications.

B. Loam shall be spread on the designated areas so as to form a cover of loam to a minimum depth of 6 inches unless otherwise shown on the drawings or directed by the Owner or Resident Engineer. Areas designated for covering with loam shall be scarified or otherwise roughened, just prior to the application of loam. After the spreading of loam all stiff clods, hard lumps, large stones, trash, wood, brush, stumps, roots, or other objectionable material shall be gathered and removed from loamed area. Compaction may be accomplished by the use of a lawn roller, weighing not more than 100 pounds per foot of width, commonly used for this work.

C. Promptly fertilize, seed, mulch, or otherwise cover, and stabilize through tracking with suitable equipment any loam placed on grades steeper than 5 percent.

3.2 APPLICATION RATES OF LIMESTONE, FERTILIZER, COMPOST, MULCH, AND SEED

A. Prepared soils shall be collected and submitted to the approved testing for testing in accordance with their guidelines. At a minimum, the soil shall be tested as per the requirements in Paragraph 2.1 of this Section. Soils shall be treated in accordance with the recommendations of the Testing Laboratory provided in their report.

B. Limestone, if required by the results of soil testing, shall be applied and thoroughly incorporated in the layer of loam to adjust the acidity of the material. Typical limestone application rates in the area have been on the order of one hundred and thirty-five pounds (135 lbs.) per thousand square foot (1,000 sq. ft.); however, the results of the test shall dictate the rate of limestone application.

C. Fertilizer, if required by the results of soil testing, shall be raked to a depth of at least two inches (2") and the area brought to a smooth surface. Typical fertilizer application rates in the area have been on the order of seven and one-half pounds (7.5 lbs.) per one thousand square feet (1,000 sf); however, the results of the test shall dictate the rate of fertilizer application.

D. Limestone and/or fertilizer shall be mixed thoroughly into the loam seedbed during preparation and prior to seeding. Mixing shall be accomplished through disking or similar method.

E. Compost, if required by the results of soil testing, may be incorporated into the loam prior to spreading or following spreading. Application rate should be as required to achieve a minimum or 10 percent organic matter. Typically, this can be achieved by applying a 2-4 inch depth of compost on top of the spread loam and thoroughly incorporating the compost into the upper six (6) inches of soil. Wide-tracked equipment must be used to avoid compaction of the soil.

F. The seed mixture shall be sown at a minimum rate of two pounds (2 lbs.) per one thousand square feet (1,000 sf).

G. Mulch shall be applied at a rate of seventy to ninety pounds (70-90 lbs) per one thousand square feet (1,000 sf).

H. As an alternative to mulch, or if mulch is found to be ineffective in preventing erosion prior to vegetation establishment, erosion control blankets may be installed as per the manufacturer's recommendations.

3.3 TIME OF SEEDING

A. The recommended seeding periods are from April 1 to June 1, and from August 15 to October 1. The Contractor may seed at other times. Regardless of the time of seeding, the Contractor shall be responsible for a full growth of grass. When directed, areas in the project which do not develop a satisfactory growth of grass shall be re-fertilized and reseeded. Re-fertilizing the reseeding shall be incidental to the original seeding item requirements. All seeding must be completed by October 15, unless authorization is obtained from the Owner.

B. Dormant seeding after October 15 shall be allowed, however, seed application rate shall be doubled.

3.4 FERTILIZING AND LIMING

A. Fertilizing and liming shall be done when the soil is in a moist condition and at least twenty-four (24) hours before the sowing of seed. The fertilizer and lime shall be applied to the soil by means of a mechanical spreader or other approved method capable of maintaining a uniform rate of application and shall be thoroughly harrowed, raked or otherwise mixed with the soil to a depth of not less than one inch (1"). The fertilizer and lime shall not be applied together. If the limestone and fertilizer are applied dry, the limestone shall precede the fertilizer and shall be worked thoroughly into the soil before the fertilizer is spread.

B. Extreme care shall be taken by the Contractor so as not to introduce fertilizer into the adjacent wetlands and waterways. Over-fertilization will not be allowed.

3.5 SOWING SEED

A. Grass seed of the required mixture and quality shall be spread by a mechanical seeder or other method which sow the seed uniformly at the required rate over the entire area to be seeded. The mechanical seeder shall be capable of being operated to avoid the growth of grass in rows and shall be so operated. After seeding, all areas shall be lightly raked by hand to mix the seed and loam. Seeded areas shall be rolled with a lawn roller not to exceed one hundred and twenty pounds (120 lbs.) in weight.

3.6 TEMPORARY EROSION CONTROL BLANKET INSTALLATION

A. Erosion control blankets shall be installed over all areas of revegetation where slopes exceed 4 horizontal to 1 vertical (4H:1V). The slopes of the embankments shall be protected using erosion control blankets.

B. Protection of seeded areas shall be either through the installation of temporary biodegradable erosion control blankets or the application of mulch. Temporary erosion control blankets may be necessary if mulch is found to be ineffective in controlling erosion prior to the establishment of vegetation.

C. Temporary erosion control blankets shall be installed as per the manufacturer's instructions and recommendations. In general, such blankets are installed down (perpendicular to) slopes and are anchored in a trench at the top of the slope.

D. All temporary erosion control blankets must be anchored to the ground by the use of stakes, as per the manufacturer's instructions and recommendations. In general, stakes should be placed in staggered rows on 2 to 3 foot centers. Stakes should be long enough to achieve adequate anchorage.

3.7 MULCHING

A. Protection of seeded areas shall be either through the application of mulch or the installation of temporary biodegradable erosion control blankets.

B. Areas which have been seeded shall be mulched immediately following seeding. Areas which cannot be seeded within the specified seeding periods shall be mulched to provide temporary protection to the soil surface. Mulch shall be spread with a mulch blower or by hand. Mulch shall be immediately anchored with a mulch-anchoring tool (operated perpendicular to the contour) or by tracking with a tracked vehicle (operated parallel to the contour). Applying mulch simultaneous to seeding in a hydroseeding operation is acceptable.

C. Straw mulch shall be applied to seeded areas at a rate of 10 pounds per 100 square feet. The rate shall be doubled for unseeded areas.

D. Wood chip mulch shall be applied to a uniform depth of approximately 3 inches.

3.8 MAINTENANCE

The Contractor shall be responsible for the watering, mowing, and other proper care of the seeded areas until final acceptance. If seeded areas have not established by the end of the Fall growing season, the maintenance period shall extend through the following Spring.

3.9 REPAIR

The Contractor shall be responsible for repair of all damage to and erosion of the loamed and seeded areas until final acceptance by the Owner. Repair responsibilities shall include, but not be limited to, repair of eroded areas, reseeding, replacement of erosion control measures, regrading, etc. The intent is to facilitate the establishment of an adequate ground cover over all disturbed areas on the site. If seeded areas have not established by the end of the Fall growing season, the period during which the Contractor is responsible for repairs shall extend through the following Spring.

3.10 ACCEPTANCE

A. Seeded areas shall be maintained until a satisfactory stand of grass is established and shows no gaps or dead spots at acceptance. The grass growth shall be widespread and robust with vigorous, healthy root growth.

B. The Contractor is responsible for ensuring that a satisfactory firm stand of grass is obtained and shall do all necessary reloaming, refertilizing and reseeding and make all necessary repairs, regardless of cause of damage, to this effect until final acceptance of the project.

C. If seeded areas have not established a satisfactory stand of grass and been accepted by the end of the Fall growing season, the Owner will defer evaluation for acceptance until the following Spring.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Measurement and payment of Contract Item 02930.1 LOAMING, SEEDING AND REVEGETATION shall be made at the contract unit price per square yard of loam placed, seeded with grass, and having established a satisfactory stand of turf to the limits indicated on the Contract Drawings and as required herein. This price shall include full compensation for all for all survey; supervision; equipment; labor; materials; handling; storage; processing; disposal; placement of existing loam and imported loam; water and watering; fertilizer; seed and seeding; protection; maintenance; repair; restoration; and any other incidental or appurtenant work as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work.

B. No separate measurement or payment shall be made under this section for restoration of vegetated or lawn areas beyond the limits of loaming, seeding, and revegetation indicated on the Contract Drawings. Restoration of these areas shall be in accordance with Section 01740 and related Sections.

4.2 PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
02930.1	LOAMING, SEEDING AND REVEGETATION	SQUARE YARD

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, equipment, materials, tools, and accessories to complete the Work of this Section. The Work of this Section includes but is not limited to:

1. Construction of reinforced concrete floodwall segments.
2. Provision of textured architectural concrete finish on certain vertical faces of reinforced concrete floodwall stemwall segments using architectural form liners **[Add Alternates 1, 2, and 3]**.
3. Construction of reinforced concrete components of deployable flood gate systems. Refer to Section 11287 Deployable Flood Barrier Systems and related sections for additional deployable flood gate system requirements.
4. Installation of augercast piles and drilled micropiles and connection to the pile caps.
5. Construction of chain link fence and swing gate improvements and restoration.
6. Installation of the new underdrain cleanouts and connection of the new underdrain system to existing drainage structures.
7. Installation of an in-line drain check valve.
8. Modification, repair, preparation, and/or abandonment of existing utility structures and pipelines.
9. Adjustment of utility structure castings (frames, grates, covers, etc.) to finished grade.
10. Other miscellaneous construction, repair, or restoration involving concrete, cementitious materials, and related items and products covered by this section, incidental to the completion of the Work, as required, as indicated on the Contract Drawings, or as directed by the Engineer.

B. The Work of this Section includes furnishing and placing cement concrete composed of specified proportions of cement, aggregates, and water mixed to form a homogeneous composition and consolidated in the work as indicated without segregation, under the Engineer's observation. The Contractor's proposed concrete mix design shall demonstrate the required compressive strengths and densities and be submitted to the Owner and Engineer.

C. Concrete elements shall be reinforced as per the requirements specified herein and as shown on the Contract Drawings.

D. The Work of this section includes furnishing and installing all cement concrete, mortar, cementitious and/or epoxy grout, steel reinforcing, dowels, inserts, waterstops, expansion joints, preformed fiber expansion joint filler, sealants, adhesives, connections, base plates, steel channels, anchors, bolts and fasteners, insulation, gaskets, and other products incidental to the Work, as required, and as indicated on the Contract Drawings.

E. The Work of this section includes all labor, materials, equipment, tools, formwork, bracing, accessories, and temporary construction required to properly deliver, place, finish, protect, cure, and complete the construction of cast-in-place concrete structures as indicated on the Contract Drawings.

F. The Contractor shall be responsible for the design, submittal, incidental costs, and scheduling implications of any modifications to the cast-in-place concrete work, as it is indicated on the Contract Drawings, for the purpose of accommodating the Contractor's proposed deployable flood gate systems designs or any other considerations based on the Contractor's means and methods of performing the Work.

G. The Contractor shall provide the Owner and its Engineering Consultant with a minimum of 48 hours advance notice of each day of concrete placement operations.

1.2 REFERENCES

The latest editions of the following:

AMERICAN CONCRTE INSTITUTE (ACI)

ACI 117	Specifications for Tolerances for Concrete Construction and Materials and Commentary
ACI 214R	Guide to Evaluation of Strength Test Results of Concrete
ACI 301	Specifications for Structural Concrete
ACI 303R	Guide to Cast-in-Place Architectural Concrete Practice
ACI 304R	Guide for Measuring, Mixing, Transporting, and Placing Concrete
ACI 304.2R	Placing Concrete by Pumping Methods
ACI 305R	Specification for Hot Weather Concreting
ACI 306R	Standard Specification for Cold Weather Concreting
ACI 308R	Guide to Curing Concrete
ACI 309R	Guide for Consolidation of Concrete
ACI 317	Specification for Tolerances for Concrete Construction and Materials
ACI 318	Building Code Requirements for Structural Concrete & Commentary
ACI 347	Guide to Formwork for Concrete

AMERICAN WELDING SOCIETY (AWS)

AWS D1.4	Structural Welding Code – Reinforcing Steel

ASTM INTERNATIONAL (ASTM)

ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C42	Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C227	Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C295	Standard Guide for Petrographic Examination of Aggregates for Concrete

ASTM C387	Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C597	Pulse Velocity Through Concrete
ASTM C805	Rebound Number of Hardened Concrete
ASTM C1077	Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation
ASTM C1107	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C1202	Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration
ASTM C1218	Standard Test Method for Water-Soluble Chloride in Mortar and Concrete
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM D512	Chloride Ion in Water
ASTM D516	Sulfate Ion in Water
ASTM E329	Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION (CTDOT)

Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction - Form 819 (2024)

1.3 RELATED SECTIONS

01010	SUMMARY OF WORK
01050	FIELD ENGINEERING
01060	REGULATORY REQUIREMENTS
01100	SPECIAL PROVISIONS
01300	SUBMITTALS
01500	TEMPORARY FACILITIES AND CONTROLS
01560	TEMPORARY EROSION AND SEDIMENT CONTROLS
01740	SITE RESTORATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02300	EARTHWORK
02465	AUGER CAST PILES
02633	INLINE CHECK VALVES
02475	DRILLED MICROPILES
02660	DUCTILE IRON PIPE AND FITTINGS
02665	VALVES AND APPURTENANCES
02710	UNDERDRAIN SYSTEM
02760	PIPELINE ABANDONMENT
02820	CHAIN LINK FENCE AND GATES
02840	VEHICLE GUIDE RAILS
05500	MISCELLANEOUS METALS
11287	DEPLOYABLE FLOOD BARRIER SYSTEMS

1.4 QUALITY CONTROL

A. The Contractor shall immediately notify the Engineer of unforeseen conditions affecting concrete work. The Contractor shall report to the Engineer within 24 hours of encountering such an unforeseen condition, with proposed modifications submitted for approval.

B. Testing Agency Qualifications: Owner will engage an independent agency qualified according

to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

C. The Contractor may engage, at his own expense, an independent testing agency to perform additional quality control tests and inspections. The independent testing agency is subject to approval by the Owner.

D. Minimum Cement Content and Minimum Strength: The cement proportion is subject to adjustment and approval by the Owner in order to ensure compliance with minimum strength requirements. Standard field test specimens conforming to ASTM C31 shall be taken on the job and the Contractor shall be required to add cement as directed by the Owner if test specimens fail to meet the minimum strength requirements. No claims will be allowed for extra cement or extra concrete due to variations in materials, proportioning, dimensions, shrinkage, waste and similar causes.

E. Consistency: The Contractor shall uniformly regulate the consistency of the mix to the slump test as directed by the Owner. The Engineer will reject all batches not conforming to this requirement, and the Contractor shall receive no compensation therefore. The Engineer will approve the lowest slump with which it is practicable to place and consolidate the mix properly.

F. Air Content: The amount of air in the concrete shall be uniformly regulated to conform to the limiting percentages specified in ASTM C260 and as specified below.

G. Defects: The Contractor shall immediately repair all defective work that does not conform to the Project Requirements.

H. Acceptance of completed concrete work requires conformance with dimensional tolerances, appearance, and strength as specified and indicated. Materials and installed work may require testing and retesting at any time during progress of work. Retesting of rejected materials for installed work shall be done at the Contractor's expense.

1.5 QUALITY ASSURANCE

A. Concrete Manufacturer/Supplier Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

B. Independent Testing Agency and Field-Testing Technician Qualifications: An independent sampling and testing agency shall be provided by the Owner.

1. Testing agencies that perform testing services on concrete materials shall meet the requirements of ASTM C1077.

2. Testing agencies that perform testing services on reinforcing steel shall meet the requirement of ASTM E329.

3. Field and Laboratory Concrete Testing Technicians shall be qualified in accordance with ACI SP-2, or equivalent, as follows:

   a. Field Concrete Sampling and Testing: Performed by ACI Concrete Field Testing Technician Grade 1.

   b. Laboratory Concrete Testing: Performed by ACI Concrete Strength Testing Technician and Laboratory Testing Technician Grade 1 or 2.

   c. Equivalent certification programs shall include requirements for written and performance examination as stipulated in ACI SP-2.

C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from one source, and obtain admixtures through one source from a single manufacturer.

D. Welding: Qualified procedures and personnel according to AWS D1.4, "Structural Welding Code Reinforcing Steel".

E. All products shall be handled, stored, and installed in accordance with the manufacturer's recommendations.

1.6 TESTS

A. Tests of cement, aggregates, and concrete mixtures will be performed to ensure conformance with the Project Requirements.

B. The Owner's independent testing firm shall perform field testing of fresh concrete, make and cure concrete test cylinders, and perform laboratory compressive strength tests for each set of cylinders prepared in accordance with ASTM C172, ASTM C31, ASTM C39, and as required herein. The Contractor may engage, at his own expense, an independent testing agency to perform additional quality control tests and inspections.

C. Refer to Part 3 of this Section for additional concrete sampling and testing requirements.

1.7 SUBMITTALS AND SAMPLES

A. Within five (5) days of issuance of Notice to Proceed, the Contractor shall submit architectural formliner manufacturer's literature, installation instructions, and other pertinent product information which indicates compliance with these Specifications for at least three available patterns (alternatives) proposed for use by the Contractor, where textured architectural concrete finishes are required and as indicated on the Contract Drawings.

   1. The Owner will select the pattern to be used for the Project from suitable alternatives submitted by the Contractor.

   2. Contractor to provide minimum 12-inch by 12-inch samples of their proposed formliner products upon request from the Owner.

   3. The formliner product selected by the Owner shall be incorporated into the other submittals required by this Section, including but not limited to Formwork Shop Drawings (Paragraph 1.7.B.4) and Architectural Finish Mock-Up (Paragraph 1.7.I). The Contractor shall be responsible for design of formwork and back-up of formliner for structural stability and sufficiency.

B. Submit the following at least 30 days prior to any concrete placement.

1. Product Data: Catalog data sheets and manufacturer's literature regarding product specifications, handling and installation recommendations, limitations, and other pertinent information for each type of product indicated.

   a. Admixtures.

   b. Form materials, architectural formliners, and form-release agents.

   c. Curing Compounds and other materials for curing concrete.

   d. Bonding Agents.

   e. Penetrating Sealants.

   f. Adhesives and adhesive anchors.

   g. Repair materials.

   h. Waterstops, gaskets, expansion joint fillers, bond-breakers, and joint sealants.

   i. Packaged cement, concrete, mortar, grout materials.

2. Concrete Mixture Design: For each strength, maximum aggregate size, and type of concrete, submit proportions for the concrete mixture that meets the properties specified and is suitable for the job conditions.

   a. Submit a complete list of materials including type; brand; source and amount of cement, fly ash, pozzolans, ground slag, aggregate and admixtures; and applicable reference specifications.

   b. Submit additional data regarding concrete aggregate if the source of aggregate changes.

   c. Submit copies of test reports showing that the mix has been successfully tested to produce concrete with the properties specified, including but not limited to compressive strength test results. The mixture shall be prepared by an accredited laboratory experienced in this field and under the direction of a licensed/registered civil engineer, who shall sign all reports and designs.

   d. The submittal shall clearly indicate where each mixture will be used.

3. Steel Reinforcement Shop Drawings: Provide drawings that detail fabrication, bending, and placement.

   a. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

   b. Indicate proposed methods for splicing reinforcing. Provide drawings that detail splice procedure.

   c. Include locations and details of utility conduit penetrations.

   d. Minimum concrete cover to reinforcing shall be maintained by the Contractor throughout the Work as indicated on the Contract Drawings. Where a textured architectural finish is required, minimum concrete cover shall correspond to the clear, perpendicular distance between the reinforcing and the concrete surface at the deepest point of the relief (i.e., in the valley).

4. Formwork Shop Drawings: Provide formwork drawings showing details of formwork including, but not limited to joints, waterstops, supports, studding and shoring, architectural formliners, and sequence and schedule of form and shoring removal.

    a. Submit product information consistent with the architectural formliner products and patterns selected by the Owner per Paragraph 1.7.A of this Section. Shop drawings shall indicate architectural formliner layout, backup, rustication, reveal, termination details, jointing, form tie locations, and pattern of placement. The formwork shop drawings shall indicate the design accommodates the maximum relief depth of the formliner while maintaining the minimum concrete cover to reinforcing as indicated on the Contract Drawings.

    b. Design, fabricate, erect, support, brace and maintain formwork so that it is capable of supporting without failure all vertical and lateral loads that may reasonably be anticipated to be applied to the formwork.

    c. Formwork shop drawings shall be prepared by or under the supervision of a qualified professional engineer.

C. Concrete Placement: Submit description of proposed placement procedures and technical literature for equipment and methods proposed for use in placing concrete. Include pumping or conveying equipment including type, size and materials for pipe, valve characteristics, and the maximum length and height concrete will be pumped. No adjustments shall be made to the mix design to facilitate pumping or placement without the acceptance of Engineer. Submit technical literature for equipment and methods proposed for vibrating and compacting concrete.

D. Concrete Curing and Protection Plan: Submit product information for proposed materials and descriptions of methods, sequence, and duration for curing, temperature control, and protection in accordance with ACI 308. Moist curing duration shall be a minimum of seven (7) days beginning immediately after concrete placement.

E. Qualification Data for:

1. Concrete supplier.
2. Contractor’s Independent Sampling and Testing Agency.
3. Welders (certifications).

F. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with the project requirements:

1. Aggregates: Submit test results for aggregate quality in accordance with ASTM C33, gradation curves, and combined gradation curve for grading proposed for use in the work and used in the mixture qualification. Submit test results confirming the potential for alkali-silica reaction are within allowable limits in accordance with ASTM C1260.
2. Cement: Submit mill test report with the concrete mixture design submittal. Mill test reports shall be no more than 6 months old.
3. Material Test Certification: For each of the following, signed by manufacturers:

    a. Cementitious materials: portland cement, fly ash, ground granulated blast-furnace slag, silica fume. Test results shall be no more than 6 months old.

    b. Admixtures.

c. Steel reinforcement and accessories.

d. Bonding agents.

e. Repair Materials.

G. Batch Tickets: Submit batch tickets for each load of ready-mixed concrete delivered to the Site.

H. Architectural Finish Mock-Up: Prepare a full-scale Mock-Up of a typical stemwall section of the reinforced concrete floodwall at least one month before installation of the permanent floodwall stemwall elements for review by the Owner and to provide a visual standard for the work.

1. At a location on the project site acceptable to the Engineer and Owner, the Contractor shall provide a full scale mock-up of the proposed floodwall stemwall construction using job-specific materials, methods, and workmanship including concrete mixture, forming and form release agents, placement and compaction, finishing, joint treatments, curing conditions, and stripping techniques to be used by the Contractor throughout the project. Demonstrate patching/repair procedures for spalls and voids associated with form ties, honeycombing, bugholes, projections, fins, offsets, and other surface imperfections and defects.

2. The Mock-Up shall also conform to the following:

a. Construct on a suitable, sacrificial foundation, of the Contractor's design, such that the completed Mock-Up unit is free-standing and presents unobstructed views of both faces, each end, and the top of the stemwall section.

b. Minimum dimensions of the Mock-Up stemwall section, excluding the foundation, shall be 4 feet high by 4 feet long by 15 inches thick. The Mock-Up is intended to represent a typical stemwall section from the top.

c. Finishes:

1) If Add Alternates are awarded, one face shall present the textured architectural formliner pattern approved by the Owner, and the other face shall present a typical untextured form, smooth-rubbed finish.

d. Install a PVC waterstop on one end consistent with the typical detail as indicated on the Contract Drawings, except that the waterstop may be terminated at the base of the Mock-Up stemwall. Installation of expansion joint filler, backer rod, and sealant are not required for the mock-up.

3. The Mock-Up shall remain at the project site for the duration of construction. At the completion of the project, the Mock-Up (including its foundation) shall become the property of the Contractor and shall be removed from Site by the Contractor in accordance with Section 02065.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Cast-in-Place Concrete: Follow ACI 301, ACE 304R, and ASTM A 934 requirements and recommendations.

1. Do not deliver concrete until forms, reinforcement, embedded items, and chamfer strips are in place and ready for concrete placement.

2. Store reinforcement of different sizes and shapes in separate piles or racks raised above the ground.

3. Protect materials from contaminants such as grease, oil and dirt.

4. Ensure materials can be accurately identified after bundles are broken and tags removed.

B. All products shall be delivered, stored, and handled in accordance with the manufacturer's recommendations and instructions.

PART 2. PRODUCTS

2.1 FORMS

A. Form-facing panels shall provide continuous, true, and smooth concrete surfaces. Furnish plywood, metal, or other approved panel materials in largest practicable sizes to minimize number of joints. Lumber shall be square edged or tongue-and-groove boards, free of raised grain, knotholes, or other surface defects. Metal form surfaces shall not contain irregularities, dents or sags.

B. Architectural Formliners: Shall be a manufactured system of plastic or urethane polymer sheets with compatible accessories designed to produce textured vertical faces of cast-in-place concrete and capable of accommodating construction loads without excessive deformation.

1. The architectural finish, to be approved by the Owner, shall be of a cut stone ashlar wall pattern such as the following, or approved equivalent:

a. Walttools, Morris, IL. 815-781-2506: Cut Stone Wall Liners.

b. Architectural Polymers, Palmerton, PA. 610-824-3322: Pattern Nos. 904A-M Ashlar Stone ¾" Relief, or 907-M Coral Ashlar Stone.

c. Sika, St. Louis, MO. 800-325-9504: Pattern No. 460.

2. Maximum relief depth not to exceed ¾-inch.

3. Formliner system shall be designed to provide seamless blending of the textured pattern at panel joints.

4. Provide a compatible formliner release agent recommended by the formliner manufacturer.

5. Provide compatible accessories per the formliner manufacturer's recommendations to form chamfers, reveals, seamless joints, and rustication as required to achieve the required dimensions and aesthetics of the finish.

C. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.

D. Chamfer, Reveal, and Rustication Strips: Wood, metal, PVC, or rubber strips, size as indicated.

E. Form-Release Agent: Commercially formulated form-release agent, verified to be compatible with proposed form and form liner materials, that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulated form-release agent with rust inhibitor for steel form-facing materials.

F. Form Ties: Factory-fabricated, removable or snap-off metal or fiberglass-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 2 inches to the plane of exposed concrete surfaces.

2. Form ties and accessories shall not reduce the effective cover of the reinforcement.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615, Grade 60 and shall be epoxy-coated, ASTM A775 or ASTM A934.

B. Mechanical Splice: ACI 301. Provide 125 minimum yield strength of the reinforcement bar. Coat connectors in accordance with the requirements of the reinforcing bars.

C. Welded Wire Fabric: ASTM A884, epoxy-coated Class A, Type 1. Provide flat sheets of welded wire fabric. Rolled fabric is not acceptable.

D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic according to CRSI's "Manual of Standard Practice," and as follows:

1. Where legs of wire bar supports contact forms, use CRSI Class 1 plastic protected steel wire or CRSI Class 2 stainless-steel bar supports.

E. Field Coating Repair/Patching Material: ASTM D3963 and ASTM A775 Annex 2 or ASTM A934; Product compatible with the shop-coating. All damaged coating shall be repaired/patched. Apply coating patching material in accordance with the manufacturer's instructions.

2.3 THREADED INSERTS AND EMBEDMENTS

A. Threaded inserts and other metallic embedded items shall be steel and hot dipped galvanized in accordance with Specification Section 05500 Miscellaneous Metals, unless specifically noted otherwise herein or on the Contract Drawings.

B. Chain link fence and gate posts shall be in accordance with Specification Section 02820.

2.4 EPOXY ADHESIVE

A. Epoxy adhesive for use with dowels, threaded rods, threaded inserts, reinforcing steel, and other post-installed items anchored to concrete shall be a two component, high solids epoxy based adhesive suitable for use in an underwater marine environment and suitable for horizontal and overhead use and meeting the requirements of ASTM C881, Type IV or V, Grade 2 or 3 and Class A, B or C (as recommended by the manufacturer). HIT-RE 500 V3 Epoxy Adhesive by Hilti, SET-XP High Strength Epoxy Adhesive by Simpson Strong-Tie, or equivalent.

2.5 EXPANSION JOINTS

A. Waterstops: PVC with centerbulb, ribbed or dumbbell type, cast-in-place across expansion joints to form a watertight diaphragm in accordance with CRD-C-572 and to the dimensions and details indicated on the Contract Drawings. PVC Waterstops used for expansion joints shall be continuous with factory-made intersections and direction changes, where required. All splices shall be heat-welded in accordance with the manufacturer's recommendations.

B. Pre-Formed Expansion Joint Filler: ASTM D1751 or ASTM D1752, Compatible with the elastomeric sealant and related products per the manufacturer's recommendations. Thickness as indicated on the Contract Drawings.

C. Backer Rod: ASTM D5249, Compressible cylindrical material used to control the depth of elastomeric sealant applied to the joint and to act as a bond breaker. Backer rod shall be compatible with the elastomeric sealant and other products utilized per the manufacturer's recommendations. Sized per the manufacturer's instructions for the required joint dimension and application.

D. Elastomeric Sealant: ASTM C920, Type S or M, Grade NS, Class 50 or greater. Cured sealant shall be a consistent gray color throughout the project. System shall be compatible with pre-formed expansion joint filler, backer rod, curing methods and materials, and other products used in the Work per the manufacturer's recommendations. Elastomeric sealant system handling, substrate preparation, application, finishing, curing, and repair shall be in accordance the manufacturer's instructions. Primers and additives shall be selected and used in accordance with the elastomeric sealant manufacturer's recommendations and instructions.

2.6 MISCELLANEOUS ACCESSORIES

A. Compressible Gasket: Compressible Neoprene (Chloroprene) or EPDM rubber sheet or strip material, solid or closed-cell foam (impermeable), suitable for marine exposures, used where required between cast-in-place concrete and existing utilities or other structures as indicated on the Contract Drawings. Smooth finish both sides. Cut to size on site. Minimum thickness of ½-inch. Durometer of 20 to 45 Shore A, or 10 to 25 Shore C.

2.7 CONCRETE MATERIALS

A. Cementitious Materials:

1. Use the following cementitious materials, of the same type, brand, and source, throughout Project:

   a. Portland Cement: ASTM C150, Type II with a tri-calcium aluminates (C3A) content less than 10 percent and a maximum cement-alkali content of 0.8 percent Na2Oe (sodium oxide) equivalent.

   b. Fly Ash: ASTM C618, Class F, including the optional requirements for uniformity and effectiveness in controlling alkali-silica reaction and shall have a loss on ignition not exceeding 3 percent. When Class F fly ash is used for mitigating alkali-silica reactivity, it shall have a calcium oxide (CaO) content of less than 8 percent and a total equivalent alkali content less than 1.5 percent. Add with cement.

   c. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120. Add with cement.

   d. Silica Fume: ASTM C1240, including the optional limits on reactivity with cement alkalis. Silica fume may be furnished as a dry, densified material or as slurry. Proper mixing is essential to accomplish proper distribution of the silica fume and avoid agglomerated silica fume which can react with the alkali in the cement resulting in premature and extensive concrete damage. Supervision at the batch plant, finishing, and curing is essential. Provide at the Contractor's expense the services of a manufacturer's technical representative, experienced in mixing, proportioning, placement procedures, and curing of concrete containing silica fume. This representative must be present on the project prior to and during at least the first 4 days of concrete production and placement using silica fume. A High Range Water Reducer (HRWR) shall be used with silica fume. Finishing may be more difficult. Proper curing is essential because there is a tendency for plastic shrinkage cracking.

B. Normal-Weight Aggregates:

1. Provide aggregates from a single source with documented service record data of satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials. All aggregates shall be tested and the results of the testing shall be provided to demonstrate the aggregates meet the requirements.

   a. The aggregates shall be well graded from coarse to fine and the gradation shall be within the limits prescribed in ASTM C33.

   b. Select aggregates which is considered not susceptible to Alkali- Silica Reactivity (ASR) when tested in accordance with ASTM C1260. Maximum allowable expansion shall be 0.08 percent at 14 days per ASTM C1260.

   c. Provide aggregates containing no deleterious material properties as identified by ASTM C295. Do not use aggregates containing soluble salts or other substances such as iron sulphides, pyrite, marcasite or ochre, which can cause stains on exposed concrete surfaces.

2. Coarse Aggregates: ASTM C33, Class E.

   a. Maximum size shall be ¾-inch, nominal, except in areas specifically designated by the Engineer to require ⅜-inch aggregate.

   b. In no case shall the maximum size of coarse aggregate exceed ¾ of the minimum clear distance between reinforcing bars or between reinforcing bars and forms.

   c. Coarse aggregates shall consist of crushed rock composed essentially of clean, hard, strong, durable and impermeable particles resistant to wear and frost, inert to cement and water, and free from deleterious amounts of organic matter, loam, clay, salts, mica, and soft, thin, elongated, laminated or disintegrated stone.

   d. Coarse aggregates shall be washed and screened, or both, if necessary, to remove fine materials and deleterious substances adhering to the aggregate.

   e. A deleterious amount of thin and elongated stones shall be considered any amount in excess of 15% of the total mass. Thin stones shall be considered to be such stone whose average width exceeds four times their average thickness.

   f. Elongated stones shall be considered to be such stone whose average length exceeds four times their average width.

3. Fine Aggregates: ASTM C33, optional grading shall apply.

   a. Fine aggregates shall have a fineness modulus of 2.80 (+ 0.20) and shall be graded within the limits prescribed in ASTM C33.

   b. Sand having acceptable gradation or particle sizes, and consisting of clean, hard, strong, durable and impermeable particles resistant to wear and frost, inert to cement and water, reasonably free from structurally weak grains, organic matter, loam, clay, silt, salts, mica or other fine materials that may affect bonding of the cement paste. The particles shall be free from alkali and other surface coatings.

C. Water:

1. Water shall be potable, clear and free from oil, acid, alkali, organic matter, silt, detergents, or other deleterious substances. Water and ice must comply with the requirements of ASTM C1602.

2. The amount of water, including surface or free moisture in the aggregates, shall be measured and controlled so that the water-cement ratio of each mix shall be accurately obtained.

2.8 ADMIXTURES

A. Source: Provide all admixtures certified by manufacturer to be compatible with the other admixtures and that will not contribute water soluble chloride ions exceeding those permitted in hardened concrete.

B. Do not use calcium chloride or admixtures containing calcium chloride.

C. Air-Entraining Admixture: ASTM C260.

D. Accelerating Admixture: ASTM C260, Type C

E. Water-Reducing Admixture: ASTM C494, Type A, E, or F.

F. Retarding Admixture: ASTM C494, Type B, D, or G.

G. High-Range, Water-reducing (HRWR) Admixture: ASTM C494, Type F.

H. Corrosion-Inhibiting Admixture: Calcium nitrite; commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C494, Type C.

I. Anti-washout Admixture: Concrete placed underwater or within the tidal zone shall include an anti-washout admixture such as Sikament 100SC manufactured by Sika Corporation, or an equivalent product that has been demonstrated to provide equivalent resistance to washout when tested in accordance with the Army Corps of Engineers CRD-C 61-89A, Test Method for Determining the Resistance of Freshly Mixed Concrete to Washing Out in Water.

2.9 CONCRETE MIXTURES - GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of Laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:

1. Fly Ash: 25 Percent

2. Combined Fly Ash and Pozzolan: 25 percent

3. Ground Granulated Blast-Furnace Slag: 50 Percent

4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 Percent Portland cement minimum, with fly ash or pozzolan not exceeding 10 percent.

5. Silica Fume: 10 Percent.

6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent total; with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent total; with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement per ASTM C1218.

D. Chloride ion penetrability of hardened concrete at 56 days shall not exceed 1,000 Coulombs per ASTM C1202.

E. Admixtures: Use admixtures according to manufacturer's written instructions and subject to approval by Engineer.

1. Use water-reducing admixture in all concrete mixtures.
2. Use high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
3. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
4. Use corrosion-inhibiting admixture in all concrete mixtures.
5. Anti-Washout Admixture required only for concrete placement in water, within the tidal zone, or where specifically indicated by the Engineer.

2.10 CONCRETE MIXTURES – DESIGN MIX

A. Ready-mixed concrete used for construction of the reinforced concrete floodwall including but not limited to the keys, pile caps, stem walls, gate columns (end posts), and other related uses or elements shall be proportioned to meet the following requirements:

1. Minimum Compressive Strength for Concrete: 5,000 psi at 28 days
2. Maximum Coarse Aggregate Size: ¾-inch
    a. Use ⅜-inch coarse aggregate (maximum) mix only in areas specifically designated by the Engineer.
3. Cementitious Material Content: minimum 675 pounds per cubic yard
4. Portland Cement Content: minimum 505 pounds per cubic yard
5. Maximum Water-Cementitious Materials Ratio: 0.40.
6. Slump Limit: 2 to 4 inches before adding high-range water reducing admixture or plasticizing admixture; 7 inches, plus or minus 1 inch with HRWR.
7. Air Content: 6 percent, plus or minus 1.5 percent.

B. Concrete used for chain link fence and gate post foundations, and underdrain cleanout collars shall be portland cement concrete, with a minimum compressive strength of 3,300 psi at 28 days in accordance with CTDOT M.10.05.

2.11 NON-SHRINK GROUT

A. Pre-bagged non-shrink grout shall be pre-blended hydraulic cement grout in accordance with ASTM C1107 and CTDOT M.03.05, mixed with potable water, and achieving a minimum compressive strength of 5,000 psi at 28 days.

B. Non-shrink grout shall be used as indicated on the Contract Drawings, for minor cast-in-place concrete repair, to fill cored holes in concrete, for fence and gate foundations in rock, in the installation of check valves, as required, and as directed by the Engineer.

C. Cementitious grout products for auger cast piles and drilled micropiles shall be accordance with Specification Sections 02465 and 02475.

D. The Contractor may formulate and design a grout mix for use on the Project in lieu of using a pre-bagged product. The Contractor shall obtain prior written approval of the Engineer for any such proposed Mix Design. Any such Mix Design shall include the proportions of hydraulic cement, potable water, fine aggregates, expansive agent, and any other necessary additive or admixture. This material shall meet all of the same chemical and physical requirements as shall the pre-bagged grout, in accordance with ASTM C1107 and as modified herein.

2.12 FIELD-MIXED MORTAR

A. Field-mixed mortar shall be composed of 1 part portland cement (Type II) to 2 parts sand by volume, mixed to the required consistency for the application using the minimum amount of water and in accordance with CTDOT M.11.04. Mixing water shall be potable.

B. Field-mixed mortar shall be used where required for filling and patching concrete surface imperfections, bug holes, and honeycombing; filling holes from form ties and lifting inserts; to modify, plug, or repair existing utility structures; to raise castings to finished grade; where indicated on the Contract Drawings, as required, or as directed by the Engineer.

2.13 BONDING AGENT

A. Specialized products and systems designed to bond steel and hardened concrete to fresh concrete and provide protection from corrosion.

B. Products shall be solvent-free, cementitious, epoxy resin, and fine aggregate (3-component) coating, formulated with corrosion inhibitor additives, designed for bonding structural concrete and concrete repairs exposed to a marine environment.

C. The color and chemical composition of the product must be compatible with the concrete and other products used for this project. The Contractor shall provide manufacturer’s literature, test data, or other information to confirm that the bonding agent is suitable for each proposed application.

D. Bonding agent shall be used only in accordance with the product manufacturer’s instructions and requirements, for the specific applications identified herein, or as specifically approved by the Owner and Engineer.

2.14 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Curing Compound: Clear, Waterborne, Membrane-forming ASTM C309, Type 1, Class B, dissipating products such as:

1. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB
2. Dayton Superior Corporation; D.S.S.C.C. Clear Resin Cure.
3. Euclid Chemical Company (The); Kurez DR.
4. Kaufman Products, Inc.; Thinfilm 420.
5. Kambert Corporation Chemicals, Inc.; Aqua Kure-Clear.
6. L&M Construction Chemicals, Inc.; L&M Cure R-2.
7. Meadows, W.R., Inc.; 1100 Clear.
8. Tamms Industries, Inc.; Horncure 30-D.
9. Vexcon Chemicals, Inc.; Certi-Vex-RC.

2.15 PENETRATING SEALANT

A. Penetrating sealant shall be a solvent-free, penetrating, surface treatment that forms a water and chloride repellent impregnation. Sealant shall not act as a vapor barrier and shall not degrade under UV exposure. Minimum solids content shall be 40%.

PART 3. EXECUTION

3.1 GENERAL

A. All work shall be shielded during concrete placement for the protection of ongoing and related work activities.

B. Provide the full-scale architectural finish mock-up in advance of permanent flood wall concrete installation. Coordinate the on-site location of the mock-up with the Owner.

C. All cast-in-place concrete elements of the flood wall shall be installed monolithically (in one continuous operation) between consecutive expansion joints and to the limits and dimensions, except where construction joints are specifically indicated on the Contract Drawings. All cast-in-place concrete elements shall be placed and consolidated as required and in a manner that minimizes presence and visibility of lift lines, surface imperfections and defects, and other unsatisfactory conditions.

D. Aluminum shall not be used in any equipment where it would be in permanent or abrasive contact with fresh concrete.

1. Aluminum stop-logs for the deployable flood gate systems will be isolated from direct contact with concrete when in service by embedded, hot-dipped galvanized steel, rubber gaskets, and similar devices. Refer to Section 11287 Deployable Flood Barrier Systems and related sections for additional deployable flood gate system requirements.

E. Whenever possible, place concrete during normal working hours. Notify the Engineer at minimum 48 hours prior to commencement of any concrete placement operations. Include within this notification, the quantity of concrete, method and placement location, frequency of trucks, ordered slump, time of initial delivery, and other special conditions.

F. Provide a delivery batch ticket to the Engineer, written in ink or computer printed, with each batch delivered to the discharge location, and as specified in ASTM C94 and in addition, indicate the following information. Failure to provide this information at delivery will be considered cause for rejection of the load.

1. Load number, truck number, and driver's name.
2. Volume of concrete (cubic yards).
3. Mix designation number.
4. Actual batch weights of cement, fine and coarse aggregate, admixtures, and water.
5. Time batched.
6. Signature of ready-mix representative.

G. Additional information which may be required at the discretion of the Engineer is as follows:

1. Compressive strength of concrete.
2. Reading of revolution counter at first addition of water.
3. Type, brand and amount of cement.
4. Type, brand and amount of admixture(s).
5. Information necessary to calculate total mixing water.
6. Maximum size of aggregate.

3.2 BATCHING, MIXING, AND DELIVERING READY-MIXED CONCRETE

A. Measure, batch mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.

1. Begin mixing concrete within 30 minutes after cement has been added to aggregates.
2. Place concrete within a maximum of 90 minutes after the addition of cement to aggregates.
3. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

3.3 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

1. Formed surfaces that will not be exposed (i.e., buried foundation elements) shall meet ACI 301 standards for as-cast, rough-form finish or Surface Finish-1.0 (SF-1.0), as specified herein, and as indicated on the Contract Drawings.

2. Formed surfaces that will be exposed (i.e., stemwalls, gate posts, surfaces of foundation elements exposed at or above-grade) shall meet ACI 301 standards for as-cast, smooth-form (SF-3.0) and smooth-rubbed or architectural finish (where required), as specified herein, and as indicated on the Contract Drawings.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

1. Exposed surface tolerances shall be in accordance with ACI 117, Class A Surface.

C. Follow all manufacturers' recommendations and instructions for installation and removal of architectural formliners.

1. Where architectural formliners are used, the Contractor shall ensure that the minimum required concrete cover is provided as indicated on the Contract Drawings and specified herein. The minimum concrete cover shall be the clear distance between the reinforcement and the concrete surface at the deepest point of the relief (i.e., in the valley).

2. The cross-sectional thickness dimension of the stem wall indicated on the Contract Drawings shall be considered the minimum where accommodation for the relief of the formliner pattern must be made to maintain the required cover of reinforcement. Where architectural finish is provided on:
   a. Both faces of a stem wall segment, the contractor shall increase the thickness dimension of the stem wall by the minimum amount necessary to accommodate the selected formliner pattern relief equally about the centerline of the stem wall, as indicated on the Contract Drawings.

   b. One face of a stem wall segment, the contractor shall increase the thickness dimension of the stem wall by the minimum amount necessary to accommodate the selected formliner pattern relief to the side of the centerline with the architectural finish only, as indicated on the Contract Drawings.

3. The additional volume of concrete installed beyond the minimum section geometry to accommodate the architectural finish will not be measured for payment. This additional volume of concrete will be considered incidental to and included in the corresponding contract items for architectural concrete finish measured in units of square feet. Refer to Part 4 of this section for additional information.

D. Construct forms tight enough to prevent loss of concrete mortar or cement grout.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrenching plates where stripping may damage cast concrete surfaces.

1. Install keyways, recesses, and the like, for easy removal.

2. Do not use rust-stained steel form-facing material.

F. Provide ports for pumping concrete and temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings and joints with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

G. Chamfer all exterior corners and edges of permanently exposed concrete. Provide ¾" chamfers unless indicated otherwise on the Contract Drawings, or as directed by the Engineer.

H. Form openings, offsets, keyways, blocking, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.4 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

B. Install anchors, inserts, dowels, and other post-installed embedded items in accordance with the Contract Drawings and approved shop drawings.

1. Drill or core, clean, and otherwise prepare holes in concrete (or rock) to receive embedded items to the required depth and dimensions in accordance with the Contract Drawings and manufacturer's instructions.

2. Place approved epoxy adhesive product, set the embedded item, finish and cure the adhesive as required and in accordance with the adhesive manufacturer's instructions.

C. PVC waterstops shall be cast-in-place at expansion joints as indicated on the Contract Drawings, in accordance with the manufacturer's instructions, and as required herein.

1. Installation of PVC waterstops may require the use of split-forms, bulkheads, or similar devices to maintain the waterstop in the correct position during concrete placement.

2. PVC Waterstops used for expansion joints shall be continuous with factory-made intersections and direction changes, where required.

3. Straight segments of PVC waterstop may be joined in the field. All splices shall be heat-welded in accordance with the manufacturer's recommendations.

4. "Lap-splicing" PVC waterstops will not be accepted.

5. Close or plug the ends of PVC waterstops in accordance with the manufacturer's recommendations.

3.5 REMOVING AND REUSING FORMS

A. Formwork for parts of the Work that do not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 72 hours after placing concrete, if concrete is hard enough to not be damaged by form removal operations and curing protection operations are maintained.

1. Leave formwork for structural elements that support weight of concrete in place until concrete has achieved at least 80 percent of its 28-day design compressive strength, or greater where required by the Contractor's shop drawing submittals.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
3. In no event shall forms be removed from concrete within 24 hours of placement.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

1. Clean, repair, and reuse architectural form liners in accordance with the manufacturer's instructions. Parts of the work found caused by architectural form liners in unsuitable condition, in the opinion of the engineer.
2. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces.

3.6 SHORES AND RESHORES

A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.

B. Plan sequence of removal of shores and reshores to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.7 STEEL REINFORCEMENT

A. Steel Reinforcement shall be installed or placed as shown on the Drawings and the approved Shop Drawings. Placement and details of reinforcement not shown on the plans shall be in accordance with ACI 315 or ACI 318 and CRSI MSP-1. At time of concrete placement, all reinforcement shall be free from loose rust, scale, mud, oil, grease or any other contaminant that could affect bond with the concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with ties and bar supports to maintain minimum concrete cover as indicated on the Contract Drawings and specified herein. Do not tack-weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Welding: Subject to approval in advance by the Owner and Engineer. Welding of reinforcement shall be performed by qualified personnel using procedures and materials in accordance with AWS D1.4.

F. Mechanical Butt Splice: Where splices are required they should conform to ACI 301 and be capable of developing tension capacity of at least 125% of the specified yield strength of the reinforcing steel.

G. Lap splice continuous reinforcement where required and in accordance with ACI 318 and the approved shop drawings.

H. Comply with manufacturer's directions for preparation of reinforcing bars and installation procedures. Field-coat and repair all areas of damaged or missing coating with approved coating repair product in accordance with the product manufacturer's instructions.

3.8 JOINTS

A. Expansion Joints

1. Expansion joints shall be installed and sealed in the locations and to the dimensions shown on the Contract Drawings using the materials specified.

2. Install PVC waterstops, pre-formed expansion joint filler, backer rod, and elastomeric sealant in accordance with the manufacturer's requirements.

3. Edges of concrete elements joined by expansion joints are exposed edges and shall be chamfered as required, as indicated on the Contract Drawings, and as directed by the Engineer.

4. Reinforcing steel shall be discontinuous across expansion joints and maintain the required cover.

B. Construction Joints

1. All cast-in-place concrete shall be installed monolithically (in one continuous operation) between consecutive expansion joints and to the limits and dimensions indicated, except where construction joints are specifically indicated on the Contract Drawings.

2. Additional construction joints, other than those indicated on the Contract Drawings, shall not be incorporated into the work without the prior review and acceptance of the Engineer.

3. Reinforcing steel shall be continuous across construction joints. Construction joints shall be oriented normal to the main reinforcement.

4. Cleanup concrete surfaces at construction joint locations to receive other concrete prior to additional concrete placement to ensure proper bonding.

a. Thoroughly clean the construction joint surface to remove laitance, loose materials, debris, and other harmful or deleterious coatings.

b. When properly prepared, the surface of the concrete will present only clean coarse aggregate surfaces and sound mortar at the time of additional concrete placement.

c. Aggressive roughening, as in a raked finish, or keyways are neither required nor desirable, due to their potential to interfere with proper joint surface cleanup and bonding conditions. The Contractor shall submit details of keyways for review by the Owner and Engineer, if proposed.

d. Surface cleanup methods may include air-water cutting (green-cut), high-pressure water jet, sandblasting, or other methods and combinations of methods to achieve the proper surface cleanup. Green-cutting shall be performed within 12 hours of concrete placement.

e. Protect coated reinforcing and adjacent concrete surfaces from damage throughout the surface cleanup procedure. Repair all damaged coatings and surfaces as required herein and as directed by the Engineer.

f. Use of bonding agents, retarders, sealants, curing compounds, or other surface-applied products on construction joints is prohibited unless specifically authorized and approved by the Owner or Engineer.

3.9 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items are complete and that required inspections have been performed.

B. All concrete, reinforcement, and formwork surfaces shall be cleaned with pressurized potable water to remove deleterious residues and kept free of debris and standing water, to the satisfaction of Engineer, when additional fresh concrete is placed.

C. Do not add water to concrete during delivery, at Project site, or during placement unless accepted by Engineer.

D. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which shall prevent the separation or loss of the ingredients. The maximum drop of fresh concrete shall be no greater than 5 feet.

E. When concrete is conveyed by chuting, the plant shall be of such size and design as to ensure a practically continuous flow in the chute. The slope of the chute shall be such that concrete of the required consistency flows without separation of the ingredients. The chute shall be flushed with water before and after each run; the water used for this purpose is not to be discharged inside the forms. Chutes shall be U-shaped, designed for this function, and in general shall have a slope varying from 25° to 45° as measured from a horizontal plane.

F. Underwater concreting, if required, shall be performed in accordance with ACI 301 and ACI 304R. Tremies, if used, must be watertight and sufficiently large to permit a free flow of concrete. Keep the discharge end continuously submerged in fresh concrete. Keep the shaft full of concrete to a level well above the water surface. Discharge and spread the concrete by raising the tremie to maintain a uniform flow. Place concrete without interruption until the top of the fresh concrete is at the required height.

   1. Underwater concreting for the proposed concrete flood wall pile cap, stem wall, and gate post (column) elements is prohibited.

G. Concrete shall be placed either by pumping through a port near the bottom of the form or by tremie methods, in one continuous placement from the bottom.

H. Deposit concrete continuously in one layer or in horizontal layers of such thickness that new concrete shall not be placed on concrete that has hardened enough to cause seams or planes of weakness. Deposit concrete to avoid segregation.

   1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.

   2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

   3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete mixture but not cause constituent segregation.

   4. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners. Follow the architectural formliner

manufacturer's instructions regarding consolidation of concrete when architectural formliners are used.

5. Maintain reinforcement in position during concrete placement.

6. Slope surfaces uniformly to drain where required.

7. Immediately strike off concrete to obtain proper contour, grade, and elevation before bleedwater appears. Permit concrete to attain a set sufficient for floating and supporting the weight of the finisher and equipment. If bleedwater is present prior to floating the surface, drag excess water off or remove by absorption with porous materials. Do not use dry cement to absorb bleedwater.

8. Begin initial floating of unformed surfaces using bull floats or darbies to form a uniform and open-textured surface plane before excess bleedwater appears on the surface. Do not further disturb unformed surfaces before starting finishing operations.

I. Cold-Weather Concreting: Comply with ACI 306R and as follows.

1. Cold weather is defined as any time during the concrete placement or curing period the ambient temperature at the work site drops below 40°F or when the temperature may reasonable be expected to drop below 35°F within 24 hours.

2. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures. Any concrete placed during cold weather shall be placed at the Contractor's risk and any damage or unsatisfactory concrete shall be removed and replaced at the Contractor's expense.

3. When cold weather is reasonably expected or has occurred within 7 days of anticipated concrete placement, the Contractor shall submit detailed procedures for the production, transporting, placing, protecting, curing, and temperature monitoring of concrete during cold weather.

4. All material and equipment required for cold weather placement and curing protection shall be available at the project site before commencing concrete placement.

5. All snow, ice, and frost shall be removed from the surfaces, including reinforcement and subgrade, against which the concrete is to be placed. The temperature of any surface that will come into contact with fresh concrete shall be at least 35°F and shall be maintained at a temperature of 35°F or above during the placement of concrete.

   The minimum concrete surface temperature requirements indicated in the Table below shall be continuously maintained for a curing period of at least 7 days. The 7-day minimum curing period of time will be extended when necessary to develop satisfactory strength in the concrete. Any day during which the minimum concrete surface temperature requirement is not continuously maintained shall not count as a day contributing to the curing period. The Contractor shall extend the required curing period, at minimum, by the number of days necessary to achieve 7 days during which the minimum concrete surface temperature is maintained or as directed by the Engineer.

Cold Weather Concrete Surface Temperature Requirements				
	Minimum Section Size Dimension			
	Under 1 foot	1-3 feet	Over 3 ft. up to 6 ft	Over 6 feet
Minimum temperature of concrete during curing period	14°C (57°F)	12°C (54°F)	10°C (50°F)	10°C (50°F)
Maximum allowable temperature drop in any 24-hour period after end of curing	28°C (50°F)	22°C (40°F)	16°C (30°F)	11°C (20°F)

6. As much as possible, any enclosure for protection shall be in place before depositing of any concrete and the remainder shall be installed as rapidly as possible in order to reduce heat losses to a minimum. Heating within the enclosure shall be attained by such means of artificial heat as will maintain the temperatures specified continuously and with a reasonable degree of uniformity in all parts of the enclosures. All exposed surfaces of concrete within the enclosure shall be kept sufficiently moist to prevent any drying of the surface concrete with possible resulting damage to the concrete in place. Heating appliances shall not be placed in such a manner as to endanger the enclosure, forms or supports, or expose any area of concrete to drying out or other injury due to excessive temperatures.

7. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

J. Hot Weather Concreting: Comply with ACI 305R and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete.

3. During hot dry weather, and as directed, all new concrete shall be kept shaded from the sun, shielded from the wind and kept wet with water, or protected by other approved methods to retain the moisture in the concrete throughout the curing period. During concrete placement operations in hot weather, appropriate measures shall be taken to reduce the hazards of increased rate of cement hydration, flash set, loss of water due to evaporation, high concrete ingredient temperatures, and the increased difficulty of concrete placing and finishing.

4. Finishing: To prevent shrinkage cracking resulting from moisture loss, the Contractor may be required to furnish windscreens, to use water fogging, or other approved means of supplying moisture. If the use of windscreens is required, the windscreens shall consist of canvas barriers of suitable height erected on the windward side of the concrete placement. Finishing operations shall follow as closely as practicable behind the placing operation so that curing may begin as soon as possible.

3.10 FINISHING FORMED SURFACES

A. Comply with ACI 301 and ACI 117.

B. Commence finishing of formed surfaces not more than 24 hours after form removal.

C. Finish textured architectural finished surfaces in accordance with the formliner manufacturer's instructions, as required herein, or as directed by the Engineer.

D. Formed surfaces not exposed above finished grade: Rough-Formed Finish (ACI 301, SF-1.0).

1. As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections.

E. Formed surfaces exposed above finished grade (without textured architectural finish): Smooth-Form and Smooth-Rubbed Finish (ACI 301, SF-3.0).

1. All irregularities shall be removed to produce a smooth and uniform surface.

2. Cut back form ties from the face of the concrete.

3. Fill all voids and cavities with a stiff patching / finishing mortar mix compatible with the bulk concrete and of the same color.

4. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and smooth-rubbed finish texture. Do not apply cement grout other than that created by the rubbing process.

3.11 FINISHING UNFORMED SURFACES

A. Comply with ACI 301 and ACI 117.

B. Place, consolidate, and immediately strike off concrete to obtain proper contour, grade, and elevation before bleedwater appears.

1. Permit concrete to attain a set sufficient for floating and supporting the weight of the finisher and equipment.

2. If bleedwater is present prior to floating the surface, drag excess water off or remove by absorption with porous material. Do not use dry cement to absorb bleedwater.

C. Unformed surfaces shall be finished as follows:

1. Float Finish: After the concrete has been placed, consolidated, struck off and leveled, do not work the concrete further until ready for floating. Begin floating when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation. During or after the first floating, check planeness of surface with a 10-ft straightedge applied at not less than two different angles. Cut down all high spots and fill all low spots during this procedure to produce a surface within Class B tolerance Per ACI 117 throughout. Immediately refloat the slab to a uniform sandy texture.

a. Provide float finish on all horizontal surfaces to remain below finished grade, unless specifically noted otherwise.

b. Provide float finish on the top surface of pile caps that are not exposed at or above finished grade.

2. Trowel Finish: First float-finish the surface as specified above, then power-trowel, and finally hand-trowel. With the first troweling after power floating, produce a smooth surface which is relatively free of defects but which may still show some trowel marks. Perform the final troweling when a ringing sound is produced as the trowel is moved over the surface. Thoroughly consolidate the surface by the hand troweling operations. Produce a finished surface which is essentially free of trowel marks, uniform in texture and appearance, and plane to a Class A tolerance per ACI 117.

a. Provide trowel finish on all horizontal surfaces exposed above finished grade, unless specifically noted otherwise.

b. Provide trowel finish on the top surface of stem walls and gate posts (columns).

3. Broom Finish: First float-finish the surface as specified above, then draw a broom or burlap belt across the surface to produce a coarse, scored texture. Permit surface to harden sufficiently to retain the scoring or ridges. Broom transverse to traffic, at right angles to the slope of the surface, or as directed by the Engineer.

a. Provide broom finish where required, as indicated on the Construction Drawings, and as directed by the Engineer.

b. Provide broom finish, transverse to the wall alignment, on the top surface of pile caps that are exposed at or above adjacent finished grade.

4. The exposed top surface of the pile caps for the deployable flood barrier systems shall be tooled and finished in accordance with the approved deployable flood barrier system shop drawings and manufacturer's instructions.

3.12 MISCELLANEOUS CONCRETING

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction.

B. Provide other miscellaneous concrete filling and grouting indicated or required to complete the Work.

3.13 CONCRETE PROTECTION AND CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306R for cold-weather protection and ACI 305R for hot-weather protection during curing.

B. Concrete and form temperature are to be maintained above 50 degrees Fahrenheit for a minimum of 7 days after placement.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms are removed during the curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure all unformed surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

a. Water.

b. Continuous water-fog spray.

c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers. Provide a secure, waterproof, windproof barrier over the absorptive cover.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected by heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.14 CONCRETE FINISH TOLERANCES AND REPAIRS

A. All concrete shall be installed and finished true to the lines and grades as indicated on the Contract Drawings, or in accordance with modifications accepted by the Owner and Engineer prior to concrete placement.

1. Conform to the requirements of ACI 301 and ACI 117 and as modified herein.
2. The finished top of wall elevation tolerance shall be plus ½-inch (minus zero) of the top of wall elevation as indicated on the Contract Drawings at any location.
3. The finished top of wall surface shall not deviate more than ⅛-inch in any direction when treated with a 10-foot-long straightedge, or more than ⅛-inch across expansion joints between wall segments of the same required top of wall elevation.

B. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired, patched, or otherwise corrected to conditions acceptable to the Owner and Engineer. The Contractor will repair, correct, or replace defective concrete that does not meet the project requirements at their own expense, using materials and methods acceptable to the Engineer and Owner.

C. Repairing Formed Surfaces: Repair and patch all voids at form ties and all surface defects including color and texture irregularities, cracks, spalls, air bubbles, “bug holes,” honeycombs, rock pockets, fins, offsets, and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, remove snap-tie cones, cut out honeycombs, rock pockets, and voids more than ½ inch in any dimension in solid concrete, but not less than 1 inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat all holes and voids with bonding agent. Fill and compact with patching mortar or non-shrink grout before bonding agent has dried or otherwise in accordance with the manufacturer’s instructions. Tool and finish the surface of patching material to smoothly blend into the surrounding concrete surface.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar or non-shrink grout will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
3. Repair defects on concealed formed surfaces that affect concrete durability and structural performance as determined by Engineer.
4. Repair surface defects in textured architectural finished surfaces in accordance with the formliner manufacturer’s instructions.

D. Perform structural repairs of concrete, subject to approval of Engineer, using epoxy adhesive, epoxy-coated steel reinforcing and dowels, and patching mortar or concrete mix consistent with the surrounding concrete to remain.

3.15 PENETRATING SEALANT

A. Penetrating sealant is to be applied to the exposed concrete surfaces. Do not apply sealant to hardware or construction joints.

B. Apply penetrating sealant to surfaces after concrete has cured to a minimum of 80% of design compressive strength, after the completion of all patching and repair and in accordance with manufacturer's recommendations. Apply penetrating sealant in a manner that will not interfere with the installation of elastomeric sealants.

C. Ensure that sealant application provides complete coverage and overlap application of adjacent phase areas.

D. Initial application is to be made in the presence of the sealant manufacturer's representative.

3.16 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare reports.

B. Contractor shall immediately inform the Engineer of any field test results that do meet the project requirements. The Engineer may reject loads of concrete delivered to the Site or work performed using concrete that does not meet the project requirements. Rejected concrete shall be removed from the site at the Contractor's expense. Retesting may be permitted at the Engineer's discretion if the Contractor submits a corrective action plan. The costs of retesting proposed by the Contractor shall be the responsibility of the Contractor and performed at no additional cost to the Owner.

C. Sampling: ASTM C172. Collect samples of fresh concrete to perform tests specified.

D. Slump: ASTM C143. Take concrete sample during concrete placement. Perform tests at commencement of concrete placement for each concrete mix delivered, when test cylinders are made, every 50 cubic yards of concrete, and whenever fresh concrete consistency or other characteristics change, but not less than one test per mix per day. If concrete does not pass slump test, adjust using a HRWR and test every concrete batch until two consecutive batches meet slump without adjustment.

E. Air Content: ASTM C231 or ASTM C173. Perform tests at commencement of concrete placement for each concrete mix delivered, when test cylinders are made, every 50 cubic yards of concrete, and whenever fresh concrete consistency or other characteristics change, and if slump test varies by more than 1 inch from previous results or concrete does not pass slump test, but not less than one test per mix per day.

F. Concrete Temperature: ASTM C1064. Perform tests when test cylinders and slump tests are made and in hot and cold weather conditions for each batch.

G. Unit Weight: ASTM C138. Perform tests when test cylinders are made.

H. Compressive Strength Tests: Mold and cure six 6x12 inch cylinders for each 50 cubic yards of each concrete mix delivered, but not less than once a day, in accordance with ASTM C172, ASTM C31 and applicable requirements of ACI 305R and ACI 306R. Prevent evaporation and loss of water from the specimen.

1. For each lot, record the date and time sampled, the batch ticket code, cylinder ID code, location of the concrete placement, total volume of concrete represented by the sample, and fresh concrete properties.

2. Compression Strength Tests: ACI 214R. Test one cylinder at 3 days. Test one cylinder at 7 days. If the 7-day test indicates that compressive strength is at least 80 percent of design compressive

strength (f'c), results will be confirmed by testing a second cylinder. If compressive strength is less than 80 percent of f'c, hold the second cylinder and test it at 14 days. Test two at 28 days, and one cylinder will be held in reserve. If the two 28-day test cylinders meet 100% of the design strength, the reserve cylinder will be discarded. Each strength test result will be the average of two cylinders from the same concrete sample tested at 28 days.

3. If the average of any three consecutive strength results is less than f'c or if any strength test results fall below f'c by more than 500 psi, a minimum of three ASTM C 42 core samples from the in-place concrete shall be collected. Locations represented by core test shall be considered structurally inadequate if the average of three core tests is less than 75 percent of f'c. Locations represented by erratic core strengths will be retested. Contractor shall remove concrete not meeting strength criteria and provide new acceptable concrete, at no additional cost to Owner. All core holes shall be repaired with non-shrink grout by Contractor. Match color and finish of adjacent concrete.

4. Non-Destructive Tests: Use of a rebound hammer to obtain data on the strength of the concrete surface shall be in accordance with ASTM C 805. Test results from the rebound hammer and other non-destructive testing may be helpful in selecting areas to extract concrete cores for destructive testing. Non-destructive tests are supplementary and shall not be a basis for acceptance.

I. Chloride Ion Penetrability: ASTM C1202. Prepare additional test specimens (cylinders), as necessary for the required testing, at the same frequency as compressive strength tests. Moist cure test specimens for 56 days. Perform chloride penetrability tests at 56 days. If test results exceed the maximum acceptance criteria (1,000 Coulombs). At the Engineer's discretion, the Contractor may perform additional testing on cored samples, at their own expense, in accordance with an approved corrective action plan. Contractor shall remove concrete not meeting the chloride ion penetrability criteria and provide new acceptable concrete, at no additional cost to Owner. All core holes shall be repaired with non-shrink grout by Contractor. Match color and finish of adjacent concrete.

PART 4. MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

A. Measurement for payment of Contract Item 03300.1 REINFORCED CONCRETE FLOOD WALL shall be based on the neat line dimensions and concrete section geometry as indicated on the Contract Drawings (without the architectural finish), and the calculated volume in cubic yards corresponding to the quantity of satisfactory work completed in accordance with this Specification, accepted, and measured in place.

B. If Add Alternate 1 is awarded, measurement for payment of Contract Item 03300.2 ADD ALTERNATE 1: ARCHITECTURAL CONCRETE FINISH (A1) shall be based on the dimensions of architectural concrete finish installed on the vertical faces of the concrete flood wall stem walls at the proposed locations and to the corresponding extents of (A1) as indicated on the Contract Drawings and the calculated area in units of square feet corresponding to the quantity of satisfactory work completed in accordance with this Specification, accepted, and measured in place.

C. If Add Alternate 2 is awarded, measurement for payment of Contract Item 03300.3 ADD ALTERNATE 2: ARCHITECTURAL CONCRETE FINISH (A2) shall be based on the dimensions of architectural concrete finish installed on the vertical faces of the concrete flood wall stem walls at the proposed locations and to the corresponding extents of (A2) as indicated on the Contract Drawings and the calculated area in units of square feet corresponding to the quantity of satisfactory work completed in accordance with this Specification, accepted, and measured in place.

D. If Add Alternate 3 is awarded, measurement for payment of Contract Item 03300.4 ADD ALTERNATE 3: ARCHITECTURAL CONCRETE FINISH (A3) shall be based on the dimensions of architectural concrete finish installed on the vertical faces of the concrete flood wall stem walls at the proposed locations and to the corresponding extents of (A3) as indicated on the Contract Drawings and the calculated area in units of square feet corresponding to the quantity of satisfactory work completed in accordance with this Specification, accepted, and measured in place.

E. There shall be no separate measurement and payment for the volume of concrete used to accommodate the relief of the selected architectural formliner pattern.

F. There shall be no separate measurement or payment under this section for work or materials incidental to the installation of chain link fences and gates, restoration of existing features, modification or repair of existing utility structures, raising castings to finished grade, pipeline abandonment or other concrete work incidental to the completion of other Contract Items. Include the costs of all incidental concrete work under the Contract Items for which it is required.

G. Concrete batch tickets shall be submitted to the Engineer, as required, and may be used for reference in the Contractor's requests for progress payment. However, batch tickets shall not be relied upon as the sole basis of measurement and payment.

4.2 PAYMENT ITEMS

A. Payment of Contract Item 03300.1 REINFORCED CONCRETE FLOOD WALL shall be made at the contract unit price per cubic yard of new flood wall structure including but not limited to concrete key, pile caps, stem walls, permanent concrete columns and embedded items for the deployable flood gate systems, and incidental work installed and complete to the lines and grades indicated on the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; excavation; subgrade preparation; installation; structural connection of the pile foundations to the pile caps; construction of forms, falsework, and bracing; reinforcing steel; architectural formliners; embedded items; concrete placement, conveying, placement, consolidation, finishing, curing, protection, and repair; preparation and installation of construction joints and expansion joints; post-installed anchorages; near-grade utility crossings; backfilling; dewatering; cleanup; disposal of waste or excess materials; and any other incidental or appurtenant work required to complete the reinforced concrete flood wall, as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work of this Section which is not included in other items.

B. If Add Alternate 1 is awarded, payment of Contract Item 03300.2 ADD ALTERNATE 1: ARCHITECTURAL CONCRETE FINISH (A1) shall be made at the contract unit price per square foot of architectural concrete finish and incidental work installed and completed on the flood-side faces of the stem walls for Wall-1, Wall-2, and Wall-4; and the protected-side faces of Wall-2, Wall-3, and Wall-4; at the locations and to the corresponding extents of (A1) indicated on the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; substrate preparation; installation; construction of forms, falsework, and bracing; chamfers, reveals, and rustication, reinforcing steel; architectural formliners; embedded items; concrete placement, conveying, placement, consolidation, finishing, curing, protection, and repair; preparation and installation of construction joints and expansion joints; post-installed anchorages; cleanup; disposal of waste or excess materials; and any other incidental or appurtenant work required to complete the architectural concrete finish on the flood-side faces of the stem walls for Wall-1, Wall-2, and Wall-4; and the protected-side faces of Wall-2, Wall-3, and Wall-4 (A1), as indicated on the Contract Drawings, in accordance with the

requirements of this Section and related Sections, and as required to complete the Work of this Section which is not included in other items.

C. If Add Alternate 2 is awarded, payment of Contract Item 03300.3 ADD ALTERNATE 2: ARCHITECTURAL CONCRETE FINISH (A2) shall be made at the contract unit price per square foot of architectural concrete finish and incidental work installed and completed on the flood-side faces of the stem walls for Wall-3, at the locations and to the corresponding extents of (A2) indicated on the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; substrate preparation; installation; construction of forms, falsework, and bracing; chamfers, reveals, and rustication, reinforcing steel; architectural formliners; embedded items; concrete placement, conveying, placement, consolidation, finishing, curing, protection, and repair; preparation and installation of construction joints and expansion joints; post-installed anchorages; cleanup; disposal of waste or excess materials; and any other incidental or appurtenant work required to complete the architectural concrete finish on the flood-side faces of Wall-3 (A2), as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work of this Section which is not included in other items.

D. If Add Alternate 3 is awarded, payment of Contract Item 03300.4 ADD ALTERNATE 3: ARCHITECTURAL CONCRETE FINISH (A3) shall be made at the contract unit price per square foot of architectural concrete finish and incidental work installed and completed on the flood-side faces of the stem walls for Wall-5 and Wall-6, at the locations and to the corresponding extents of (A3) indicated on the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; substrate preparation; installation; construction of forms, falsework, and bracing; chamfers, reveals, and rustication, reinforcing steel; architectural formliners; embedded items; concrete placement, conveying, placement, consolidation, finishing, curing, protection, and repair; preparation and installation of construction joints and expansion joints; post-installed anchorages; cleanup; disposal of waste or excess materials; and any other incidental or appurtenant work required to complete the architectural concrete finish on the flood-side faces of Wall-5 and Wall-6 (A3), as indicated on the Contract Drawings, in accordance with the requirements of this Section and related Sections, and as required to complete the Work of this Section which is not included in other items.

ITEM NO.	PAYMENT ITEM	UNIT
03300.1	REINFORCED CONCRETE FLOOD WALL	CUBIC YARD
03300.2 (ADD ALT. 1)	ADD ALTERNATE 1: ARCHITECTURAL CONCRETE FINISH (A1)	SQUARE FOOT
03300.3 (ADD ALT. 2)	ADD ALTERNATE 2: ARCHITECTURAL CONCRETE FINISH (A2)	SQUARE FOOT
03300.4 (ADD ALT. 3)	ADD ALTERNATE 3: ARCHITECTURAL CONCRETE FINISH (A3)	SQUARE FOOT

END OF SECTION

SECTION 05500

MISCELLANEOUS METALS

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, equipment, materials, tools, and accessories to complete the Work of this Section. Work under this section shall consist of ferrous and non-ferrous metal items, field- or shop-fabricated, coated or uncoated, galvanized, or primed and painted, welded or bolted, and all other miscellaneous metal fabrications or related items as required, as specified herein, and as indicated on the Contract Drawings, including but not limited to:

1. Concrete Reinforcement – bars, dowels, welded wire fabric, and related accessories.
2. Concrete Embedment – anchors, inserts, channels, bearing plates, and related accessories.
3. Deployable Flood Gate and Storage Systems.
4. Chain Link Fence and Gates.
5. Gabion Baskets.
6. Drilled Micropile foundations and connections.
7. Auger Cast Pile foundations and connections.
8. Utility Structures and Pipe.
9. Vehicle Guide Rails.

1.2 RELATED SECTIONS

01010	SUMMARY OF WORK
01300	SUBMITTALS
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02300	EARTHWORK
02375	GABIONS
02465	AUGER CAST PILES
02475	DRILLED MICROPILES
02633	INLINE CHECK VALVES
02660	DUCTILE IRON PIPE AND FITTINGS
02665	VALVES AND APPURTENANCES
02760	PIPELINE ABANDONMENT
02820	CHAIN LINK FENCE AND GATES
02840	VEHICLE GUIDE RAILS
03300	CAST-IN-PLACE CONCRETE
11287	DEPLOYABLE FLOOD BARRIER SYSTEMS

1.3 REFERENCES

A. References herein to any technical society, organization, group or body 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:

1. Aluminum Association (AA)
   - AA-M10 Unspecified As Fabricated Finish
   - AA-M12 Nonspecular As Fabricated Finish

2. American Institute of Steel Construction (AISC)

3. American Society for Testing and Materials (ASTM)
   - ASTM A6 Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
   - ASTM A36 Standard Specification for Carbon Structural Steel
   - ASTM A108 Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
   - ASTM A123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
   - ASTM A143 Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
   - ASTM A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
   - ASTM A276 Standard Specification for Stainless Steel Bars and Shapes
   - ASTM A307 Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength
   - ASTM A384 Standard Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies
   - ASTM A385 Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)
   - ASTM A563 Standard Specification for Carbon and Alloy Steel Nuts
   - ASTM A572 Standard Specification High-Strength Low-Alloy Columbium-Vanadium Structural Steel
   - ASTM A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
   - ASTM A775 Standard Specification for Epoxy-Coated Steel Reinforcing Bars
   - ASTM A780 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
   - ASTM A934 Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
   - ASTM A975 Standard Specification for Double-Twisted Hexagonal Mesh Gabions and Revet Mattresses (Metallic-Coated Steel Wire or Metallic-Coated Steel Wire With Polymer Coating)
   - ASTM A992 Standard Specification for Structural Steel Shapes
   - ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
   - ATSM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
   - ASTM B241 Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube
   - ASTM B316 Standard Specification for Aluminum and Aluminum-Alloy Rivet and Cold-Heading Wire and Rods
   - ASTM B429 Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube
   - ASTM D3963 Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars
   - ASTM F436 Standard Specification for Hardened Steel Washers Inch and Metric Dimensions
   - ASTM F593 Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

ASTM F594 Standard Specification for Stainless Steel Nuts
ASTM F626 Standard Specification for Fence Fittings
ASTM F668 Standard Specification for Polyvinyl Chloride (PVC), Polyolefin and Other Polymer-Coated Steel Chain Link Fence Fabric
ASTM F844 Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use
ASTM F1043 Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework
ASTM F1083 Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
ASTM F1554 Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
ASTM F1664 Standard Specification for Poly(Vinyl Chloride) (PVC) and Other Conforming Organic Polymer-Coated Steel Tension Wire Used with Chain-Link Fence
ASTM F2329 Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners
ASTM F3125 Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength

4. American Welding Society (AWS)
   AWS B2.1 Specification for Welding Procedure and Performance Qualification
   AWS D1.1 Structural Welding Code – Steel
   AWS D1.2 Structural Welding Code – Aluminum
   AWS D1.4 Structural Welding Code – Reinforcing Steel
   AWS D1.5 Structural Welding Code – Bridges
   AWS D1.6 Structural Welding Code – Stainless Steel
5. State of Connecticut Department of Transportation - Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction - Form 819 (2024)
6. Steel Structures Painting Council (SSPC)
7. The Connecticut State Building Code (CSBC)

1.4 SUBMITTALS

A. Submit shop drawings and calculations, as required, for metal items and fabrications specified under related Sections. Shop drawings and calculations shall be prepared and stamped by licensed professional engineer (P.E.) registered in the State of Connecticut for the following items:

1. Deployable Flood Gate and Storage Systems including but not limited to deployable stop logs and bracing components, modular stage units, and permanent metal components installed in the reinforced concrete flood wall – refer to Sections 03300 and 11287.
2. Drilled Micropiles and Auger Cast Piles – refer to Sections 02300, 03300, 02465, and 02475.
3. Gabion Retaining Walls – refer to Sections 02300 and 02375.
4. Temporary structures or equipment such as bracing and support-of-excavation systems.
5. Lifting plans.
6. Any design modification or substitution proposed by the Contractor which deviates from the Project Requirements or the Contract Drawings, at the discretion of the Engineer.

B. Submit product information, manufacturer's literature, and instructions for all products used to complete the Work of this Section and shop drawings for any metal fabrication.

1. Indicate all pertinent information including but not limited to profiles, shapes, grades, finishes, dimensions, sizes, connections, attachments, welding, size and type of fasteners, size and locations of holes, coatings, and accessories.

2. Indicate locations, quantities, storage and handling requirements, methods of assembly, anchorage and connections to other members, and installation and maintenance requirements.

3. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

4. Indicate details, dimensions, and templates for embedded anchor bolts.

C. Submit welder certifications and testing agency qualifications.

D. Submit supplier information, material and mill test reports, and manufacturer's test reports and data demonstrating materials and fabrications supplied for use in the Work conform to the Project Requirements, as required herein and under related Specification Sections, and as indicated on the Contract Drawings.

PART 2. PRODUCTS

2.1 GENERAL

A. All products shall be as specified herein, unless noted otherwise, and as indicated on the Contract Drawings.

2.2 AMERICAN IRON AND STEEL

A. Iron and steel products used in the project shall be produced in the United States in accordance with the Contract Documents, project funding requirements, and governing federal law Section 436 of Public Law (P.L.) 113-76, Consolidated Appropriations Act, 2014.

2.3 STEEL

A. General

1. Structural Sections, shapes, channels, angles, plates, and bar: ASTM A36/A992; hot-dip galvanized ASTM A123.

2. Bolts: ASTM A307 or ASTM F3125, Grade A325 (as specified or indicated on the Contract Drawings); hot-dip galvanized ASTM A153/F2329.

3. Heavy Hex Nuts: ASTM A563, Gr. DH; hot-dip galvanized ASTM A153/F2329.

4. Flat, Bevel, or Thick Washers: ASTM F436, Type 1; hot-dip galvanized ASTM A153/F2329.

5. Anchor Bolts and All-Thread Rod: ASTM F1554, Gr. 36; hot-dip galvanized ASTM A153/F2329.

6. Shear Connectors (Studs): ASTM A108, headed stud type; hot-dip galvanized ASTM A123; conforming to AWS D1.1, Type B studs.

7. Welding Electrodes: E70xx, complying with AWS requirements.

8. Galvanized coating repair and touchup: ASTM D3963.

B. Gabion baskets in accordance with Section 02375 – Gabions.

C. Auger cast pile reinforcement in accordance with Section 02465 – Auger Cast Piles.

D. Drilled micropile casing and reinforcement in accordance with Section 02475 – Drilled Micropiles.

E. Steel fencing materials in accordance with Section 02820 – Chain Link Fence and Gates.

F. Vehicle guide rails in accordance with Section 02840 – Vehicle Guide Rails.

G. Concrete reinforcement in accordance with Section 03300 – Cast-in-Place Concrete.

H. Steel components for the deployable flood gates and storage in accordance with Section 11287 – Deployable Flood Barrier Systems.

2.4 STAINLESS STEEL

A. Stainless steel shall be type 316.

1. Bars and Shapes: ASTM 276
2. Bolts and Screws: ASTM F593
3. Nuts: ASTM F594

B. Stainless steel welding materials shall be in accordance with AWS D1.6.

2.5 ALUMINUM

A. Aluminum components for the deployable flood gates and storage in accordance with Section 11287 – Deployable Flood Barrier Systems.

B. Aluminum welding materials shall be in accordance with AWS D1.2.

PART 3. EXECUTION

3.1 GENERAL

A. Deliver, store, handle, and install all items in accordance with the manufacturer's instructions and industry best management practices to prevent damage to items and coatings.

B. Make provisions for erection loads with temporary bracing. Keep all work in correct alignment per AISC 303.

C. Install items plumb and level, accurately fitted, free from distortion or defects.

D. Perform all welding in accordance with the applicable AWS code.

E. Touch up field welds, scratched, or otherwise damaged surfaces in accordance with the product manufacturer's instructions and to the satisfaction of the Owner and Engineer.

F. Field-treat and coat damaged galvanized finish and exposed threaded surfaces with two coats of zinc rich paint conforming to ASTM A780 and in accordance with the product manufacturer's instructions.

G. Locate all items as indicated on the Contract Drawings and approved shop drawings.

H. Dissimilar metals shall be fully isolated from contact using appropriate coatings, plastic, nylon, PVC, or rubber materials suitable for the application based. Aluminum elements shall not be designed or installed in permanent contact with concrete.

3.2 FABRICATION

A. Verify dimensions in the field and of related products and materials prior to submission of shop drawings.

B. Fabricate items with joints tightly fitted and secured.

C. Fit and shop-assemble in largest practical sections, for delivery to the site.

D. Grind exposed welds flush and smooth with adjacent finished surface.

E. Ease exposed edges to small uniform radius.

F. Make exposed joints butt tight, flush, hairline, or as indicated.

G. Supply and install components required for anchorage of metal fabrications. The Contractor shall fabricate anchorage and related components of same material and finish as metal fabrication, except where specifically noted otherwise. Refer to related sections for additional requirements.

H. Supply and install all specially fabricated plates, washers, and other items as required.

3.3 TESTS

A. Perform non-destructive testing for all welds in accordance with the applicable AWS code.

3.4 DEFECTIVE WORK

A. Any item installed in an unsafe manner or condition, not meeting industry standards, not in accordance with the Contract Documents, that does not function or fit as intended, or is not complete and finished to the satisfaction of the Owner and Engineer.

B. Defective work and component items shall be repaired or replaced to meet the Project Requirements to the satisfaction of the Owner and Engineer, at no additional cost to the Owner.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. No separate measurement or payment will be made for associated work under this Section. Include all cost for work and materials covered by the section under the Contract Items for which miscellaneous metals are required.

END OF SECTION

SECTION 11287

DEPLOYABLE FLOOD BARRIER SYSTEMS

PART 1. GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all labor, equipment, materials, tools, and accessories to complete the Work of this Section. Work under this section shall consist of design, fabrication, installation, and any other incidental work required to complete the deployable flood barrier systems (deployable flood gates) and corresponding modular storage containers as specified herein, and as indicated on the Contract Drawings, including but not limited to:

1. Engineering design; calculations; shop drawings; erection and layout drawings; diagrams and instructions for system installation, deployment, storage, and maintenance; delegated design submittals and other technical submittals.
2. Coordination with concrete flood wall, pile cap, and gate column (end post) construction and related field measurement and verification of all pertinent dimensions, locations, conditions, and other items affecting the installation and function of the deployable flood barrier systems.
3. Shop fabrication, delivery, and installation of the deployable flood barrier system components, related and design-dependent items to be embedded in concrete (i.e., anchors, base plates, channels, etc.), and the corresponding modular storage containers. Modular storage containers shall be portable, custom-designed, and prefabricated by the deployable flood barrier manufacturer.
4. Final design and construction of at-grade storage pads to support the modular storage containers.
5. Full-scale field-assembly, test-fitting, leak testing, and demonstration of each deployable flood barrier system in its final location; disassembly; and return of the deployable system components to their corresponding modular storage container.
6. Performance of any field-modification, provision and installation of supplemental materials, or other effort, if and as necessary to ensure the as-constructed deployable flood barrier systems function as intended and the completed systems each meets the specified requirements and design performance criteria.
7. Final placement of the modular storage containers on their storage pads.
8. Disposal of all excess or unsuitable materials provided for or generated by the work.
9. Coordination and sequencing the construction of the deployable flood barrier systems with other work of the Contract and with the Owner and Engineer.
10. Conducting all work in accordance with OSHA requirements and other applicable laws and regulations, and with the requirements of all federal, state, and local agencies and authorities having jurisdiction over the work.

B. The perimeter flood protection system improvements cross existing roadways and driveways that provide access to the WPCF and nearby properties. To accommodate and maintain these existing access routes, only minor alterations in corresponding geometry and grade are included in the project. The resulting “gate” openings (refer to Contract Drawings Gate-A, Gate-B, and Gate-C) will permit levels of access similar to the existing conditions while enabling increased levels of flood protection during flood events. The deployable flood barrier systems are intended to provide adequate closure and continuity

of the perimeter flood protection system up to the design flood elevation when fully deployed at each gate location. The deployable components are to be stored on-site in an organized fashion to enable rapid deployment by WPCF or other emergency response personnel when flood conditions are anticipated using limited manual effort and common tools or equipment.

C. The locations and details shown on the Contract Drawings represent the available area, geometry, and required minimum dimensions and clearances. Any layout outside of these specified parameters shall only be used with written permission from Owner and no permission for additional space is guaranteed, if requested.

1.2 RELATED SECTIONS

01010	SUMMARY OF WORK
01050	FIELD ENGINEERING
01060	REGULATORY REQUIREMENTS
01100	SPECIAL PROVISIONS
01200	PROJECT COORDINATION AND MEETINGS
01300	SUBMITTALS
01740	SITE RESTORATION
02065	DEMOLITION, REMOVAL, AND DISPOSAL
02300	EARTHWORK
02465	AUGER CAST PILES
02475	DRILLED MICROPILES
02510	BITUMINOUS CONCRETE PAVEMENT
03300	CAST-IN-PLACE CONCRETE
05500	MISCELLANEOUS METALS

1.3 REFERENCES

A. References herein to any technical society, organization, group or body 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:

1. Aluminum Association (AA)
2. American Concrete Institute (ACI)
3. American Institute of Steel Construction (AISC)
4. American Society of Civil Engineers (ASCE)
5. American Society for Testing and Materials (ASTM)
6. American Welding Society (AWS)
7. Connecticut State Building Code (CSBC)
8. State of Connecticut Department of Transportation - Standard Specifications for Roads, Bridges, Facilities, and Incidental Construction - Form 819 (2024)
9. Steel Structures Painting Council (SSPC)
10. United States Army Corps of Engineers (USACE)

1.4 SUBMITTALS AND SAMPLES

A. The Contractor shall be responsible for the timely submittal of all required information for review prior to ordering products and fabrication. The Contractor shall coordinate the timing of submittals with construction progress and with fabrication lead times to avoid delaying the Work.

B. Preliminary Coordination Plan: Not less than four (4) weeks prior to the scheduled installation of the concrete pile caps located at each proposed deployable flood gate system location, the Contractor shall submit a preliminary coordination plan including drawings or diagrams and written descriptions of the proposed layout, methods and sequence of installation, temporary traffic control measures (including traffic control plans per Section 01100), field engineering and measurement, and other preliminary coordination necessary to support the Contractor's delegated design of the deployable flood barrier systems. Identify any additional coordination with the Owner, Engineer, WPCF personnel, utility companies, public safety agencies, and others, as applicable or necessary to maintain the Contractor's schedule. Include information to levels of detail and accuracy necessary for the Contractor's personnel to properly locate, prepare, and construct the permanent reinforced concrete flood wall elements (i.e., pile caps, gate columns, and stem walls) that are affected by or in the immediate vicinity of the deployable flood barrier systems.

C. Product Data: For each type of product, material, or component included in the deployable flood barrier systems, corresponding modular storage containers, and all other items incidental to the work of this Section.

1. Submit manufacturer's product literature, data, installation instructions, and any other pertinent information for all items used to fabricate, handle, and erect each of the proposed deployable flood barrier systems and corresponding modular storage containers.

2. Submit required data for the geotextile and crushed stone fill materials to be used for the construction of the storage pads in accordance with Section 02300 – Earthwork, and as specified herein.

D. Design Submittals: For each deployable flood barrier system and corresponding modular storage container, prepared and stamped by a qualified, registered Professional Engineer (P.E.) licensed in the State of Connecticut, including:

1. Calculations and data analysis for the structural forces and other parameters for the deployable flood barrier designs.

2. Checks of the capacity of each element to adequately resist the design parameters and environmental loading requirements at the appropriate factors of safety in accordance with industry and referenced standards.

3. Specification of all required products and methods for the fabrication and construction of the deployable flood barrier systems including but not limited to:

a. Aluminum stop logs with extruded interlocking profiles and integrated rubber gaskets.

b. Deployable hot-dipped galvanized components and assemblies required to support the aluminum stop logs including intermediate supports, braces, cover plates, and corresponding fasteners.

c. Hot-dipped galvanized steel components permanently embedded in the reinforced concrete flood wall, such as channels, plates, angles, brackets, anchors, threaded inserts, fasteners and other similar or related items.

d. Deployable clamping (compression) mechanisms and hardware to secure the stop logs to the intermediate supports and permanent concrete columns (end posts).

e. Modular storage containers with customized devices for organized storage of the deployable system components.

f. Gaskets to seal the bottom of the stop logs and intermediate braces to the pile cap when deployed.

g. Concrete finishing and tolerance requirements.

h. Fabrication and system erection tolerances.

i. Welds.

j. Adhesives.

4. Drawings showing the proposed layout within available areas for deployable flood barrier systems and modular storage containers in plan views; typical and representative section and elevation views.

   a. Include details of fabrication, welding, bolts, holes, threaded inserts, anchors, base plates or mounting plates; and any other pertinent information required to fabricate and install the required systems.

   b. Include all dimensions, locations, elevations, shapes, grade, type, and other characteristic information of the elements as required.

   c. Include specifications and diagrams of the modular storage containers with internal and external dimensions and layout.

   d. Typical dimensions, locations, and construction of the modular storage container pads are indicated on the Contract Drawings. The final modular storage pad design requirements shall be determined by the Manufacturer included on the submitted shop drawings for review.

5. Specification of the required construction and fabrication tolerances. Demonstrate that the assembled system meets or exceeds the required performance criteria with consideration for those tolerances. Coordination with the various sub-contractors and field-verification of all dimensions, locations, and conditions is included herein as a requirement of this Section.

6. Lifting plans for the modular storage containers and other items requiring the use of lifting equipment.

E. Samples: Submit one of each to both the Owner and Engineer.

1. Concrete Anchors (Threaded Inserts): Complete units including the coil loop anchor or similar device, threaded anchor bolt (heavy hex), and “headless” threaded bolt.

2. Aluminum Stop Logs (planks): Complete sections, minimum 12-inch-long with rubber gasket installed.

3. Other Vertical and Horizontal Gaskets: As applicable, proposed profiles, strip, or sheet stock; minimum 12 inches long.

F. Submit descriptions of on-site delivery procedures, unloading requirements, and locations. Coordinate all transportation and deliveries with the appropriate suppliers, vendors, fabricators, and manufacturers. On-site delivery, unloading procedures, and locations will be coordinated by the Contractor and Manufacturer, with and subject to the approval of the Owner.

G. Submit shop drawings, calculations, product information, certifications, and qualifications as required, for metal items and fabrications specified under Section 03300 – Cast-in-Place Concrete, Section 05500 – Miscellaneous Metals, related Sections.

H. Submit manufacturer and vendor qualification information, material and mill test reports, and manufacturer's test reports and data demonstrating materials and fabrications supplied for use in the Work conform to the Project Requirements, as required herein and under related Specification Sections, and as indicated on the Contract Drawings.

I. Submit an operations and maintenance manual for each deployable flood gate with written instructions and recommended procedures for deployable flood barrier system deployment, assembly, operation, and disassembly including any special handling or equipment requirements; itemized inventories of all components (organized by gate location), component storage recommendations and diagrams, maintenance schedules, and information regarding replacement components. This information shall be submitted for review initially at the time of design and fabrication. The Contractor shall revise, update, and compile this information accordingly and for consistency with the as-built systems and re-submit the finalized information (Owner's Manual) to the Owner prior to project completion. Provide the Owner with an electronic copy (PDF) and one bound, hard copy of the finalized Owner's Manual.

J. Extra Parts:

1. Provide the Owner with full-size rubber gasket units of each type in a quantity equal to 10-percent of the amount furnished with the completed systems. Provide specialized installation tools and materials.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: The Manufacturer shall be a firm experienced in manufacturing and installing products and systems similar to those indicated for this Section with a record of successful in-service performance. The Manufacturer shall have sufficient technical service and production capacity to produce the required systems. Procure products from manufacturers able to comply with qualification requirements, warranty requirements, and technical service requirements.

1.6 WARRANTY

A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace defective components of flood wall barrier system with defects in materials or workmanship within specified warranty period.

1. Defects include metal kinks, sharp bends, and other conditions detrimental to the installed deployable flood barrier systems and corresponding modular storage containers.

2. Warranty Period: 10 years from date of Substantial Completion.

1.7 DESIGN CRITERIA

A. GENERAL

1. Minimum preliminary dimensional requirements and design information are indicated on the Contract Drawings.

2. The Contractor shall select a qualified manufacturer, experienced in the successful design, fabrication, and delivery of similar deployable flood barrier systems and modular storage containers to supply systems meeting the project requirements.

3. Field Measurements: The Contractor shall be responsible for field measurement and verification of all dimensions and conditions of other construction wherever the deployable flood barrier system must fit and be integrated into the perimeter flood protection improvements prior to fabrication. These measurements shall include but are not limited to dimensions, heights, relative location, and other geometry of the concrete flood wall foundation piles, pile caps, stem walls, and gate columns; roadways; driveways; and other site features that potentially influence the Work of this Section.

B. PERFORMANCE REQUIREMENTS

1. Structural Performance: Provide deployable flood barrier systems capable of withstanding the effects of hydrostatic, hydrodynamic, wave, wind, and impact loads in accordance with ASCE 7, ASCE 24, and USACE Design Manuals applicable to flood control structures. Refer to Sheet S-401 for Design Load Case #1 and #2.

2. Seepage/Leakage: The maximum allowable leakage through the deployable flood barrier system at the design hydrostatic and hydrodynamic loading conditions shall be in accordance with the requirements of ANSI/FM Global 2510 standard equating to 0.05 gallons per linear foot of barrier per minute (0.05 GPM/LF).

3. Flood and Wind Loads: The deployable flood barrier system shall remain in place, without permanent deformation or separation of any system components when subjected to the loads and stresses within the limits of and under the conditions indicated in accordance with ASCE 7, ASCE 24, USACE, and the design parameters indicated herein and on the Contract Drawings; and the system will be fully operational after the flood event.

4. Additional required design parameters are indicated on the Contract Drawings.

PART 2. PRODUCTS

2.1 GENERAL

A. All products shall be as specified herein, unless noted otherwise, and as indicated on the Contract Drawings.

B. Provide components and materials specified and required under this Section from a single manufacturer.

C. Basis-of-Design Product: Subject to compliance with the project requirements, suitable systems such as the following, or approved equal.

1. Flood Control America – Denver, CO; 970-946-6679; http://floodcontrolam.com.

2. Flood Control International – New York, NY; 212-903-4554; https://floodcontrolinternational.com/.

2.2 AMERICAN IRON AND STEEL

A. Iron and steel products used in the project shall be produced in the United States in accordance with the Contract Documents, project funding requirements, and governing federal law Section 436 of Public Law (P.L.) 113-76, Consolidated Appropriations Act, 2014.

2.3 STEEL

A. Concrete Embeds, Anchors, Base Plates, Deployable Intermediate Supports and Braces, Fasteners, Clamps, Brackets, Angles, and Accessories as required herein and in accordance with the approved shop drawings.

1. Structural Sections, shapes, channels, angles, plates, and bar: ASTM A36/A992; hot-dip galvanized ASTM A123.
2. Bolts: ASTM F3125, Grade A325; hot-dip galvanized ASTM A153/F2329.
3. Heavy Hex Nuts: ASTM A563, Gr. DH; hot-dip galvanized ASTM A153/F2329.
4. Flat, Bevel, or Thick Washers: ASTM F436, Type 1; hot-dip galvanized ASTM A153/F2329.
5. Anchor Bolts and All-Thread Rod: ASTM F1554, Gr. 36; hot-dip galvanized ASTM A153/F2329.
6. Shear Connectors (Studs): ASTM A108, headed stud type; hot-dip galvanized ASTM A123; conforming to AWS D1.1, Type B studs.
7. Welding Electrodes: E70xx, complying with AWS requirements; AWS D1.1
8. Galvanized coating repair and touchup: ASTM D3963.

B. Modular Storage Containers shall be of durable, welded steel construction, weather-tight, portable, and lockable with built-in organization (shelves, racks, storage bays, etc.) designed to store the deployable flood barrier components – such as a modified ISO 668 Intermodal Freight Container, according to the approved design and shop drawings submittal.

1. Minimum of 3 units; custom-designed and prefabricated for efficient storage of each deployable flood barrier system (Gate-A, Gate-B, and Gate-C)
2. Corrosion-resistant exterior coating or paint. Color: gray, as approved by the Owner.
3. Accessible at-grade, with lockable doors of sufficient size and location to allow items to be stored and removed in a safe and efficient manner.

2.4 STAINLESS STEEL

A. Stainless steel shall be type 316.

1. Bars and Shapes: ASTM 276
2. Bolts and Screws: ASTM F593
3. Nuts: ASTM F594

B. Stainless steel welding materials shall be in accordance with AWS D1.6.

2.5 ALUMINUM

A. Stop Logs (planks).

1. Aluminum alloy 6063-T6 or 6061-T6, ASTM B221.
2. Extruded sections with interlocking profiles and integrated rubber gaskets.
3. Individual plank sections minimum height of 12 inches.
4. Mill Finish: AA-M10 or AA-M12

B. Aluminum welding materials shall be in accordance with AWS D1.2.

2.6 GASKETS

A. EPDM bulb seals, durometer of 70 Shore A.

B. Closed-cell, expanded EPDM; ASTM D1056.

PART 3. EXECUTION

3.1 GENERAL

A. Examine all substrates and conditions with Contractor, Manufacturer, and Installer present to confirm compliance with requirements for installation and performance. Concrete finishes and tolerances shall be in accordance with the Manufacturer's requirements and the approved shop drawings.

B. Make provisions for erection loads with temporary bracing. Keep all work in correct alignment.

C. Install items plumb and level, accurately fitted, free from distortion or defects.

D. Embedded base plates, cover plates, and "headless" fasteners shall be flush to the surrounding surface of concrete.

E. Perform all welding in accordance with the applicable AWS code.

F. Touch up field welds, scratched, or otherwise damaged surfaces in accordance with the product manufacturer's instructions and to the satisfaction of the Owner and Engineer.

G. Field-treat and coat damaged galvanized finish and exposed threaded surfaces with two coats of zinc rich paint conforming to ASTM A780 and in accordance with the product manufacturer's instructions.

H. Locate all items as indicated on the Contract Drawings and approved shop drawings.

I. Install the modular storage units in accordance with the approved shop drawings.

J. Perform all concrete construction in accordance with the approved shop drawings and Section 03300 – Cast-in-Place Concrete.

K. Perform all earthwork construction, including but not limited to the modular storage unit pads in accordance with the approved shop drawings and Section 02300 – Earthwork.

3.2 FABRICATION

A. Verify dimensions in the field and of related products and materials prior to submission of shop drawings.

B. Coordinate dimensions and conditions of adjoining elements to produce integrated flood barrier system assemblies with closely fitted joints and aligned edges.

C. Fabricate items with joints tightly fitted and secured. Fabricate complete system to be a watertight barrier.

D. Fit and shop-assemble in largest practical sections, for delivery to the site.

E. Grind exposed welds flush and smooth with adjacent finished surface.

F. Ease exposed edges to small uniform radius.

G. Make exposed joints butt tight, flush, hairline, or as indicated.

H. Supply and install components required for anchorage of metal fabrications. The Contractor shall fabricate anchorage and related components of same material and finish as metal fabrication, except where specifically noted otherwise. Refer to related sections for additional requirements.

I. Supply and install all specially fabricated plates, washers, and other items as required.

3.3 FIT AND LEAK TEST

A. Perform fit and leak testing in the presence of the Engineer and Owner's representatives. Contractor coordinates the timing of the fit and leak testing with the Owner's representative.

B. Fully deploy each deployable flood barrier system in its assigned location to demonstrate the system deployment or erection and confirm the fit of all components.

C. Perform leak testing per the manufacturer's requirements.

D. Resolve any deficiencies or perform any adjustments in accordance with the manufacturer's recommendations.

E. Following the Owner's acceptance of the Fit and Leak Tests, fully disassemble and store all deployable components in their corresponding modular storage units.

3.4 DEFECTIVE WORK

A. Any item installed in an unsafe manner or condition, not meeting industry standards, not in accordance with the Contract Documents, that does not function or fit as intended or is not complete and finished to the satisfaction of the Owner and Engineer.

B. Defective work and component items shall be repaired or replaced to meet the Project Requirements to the satisfaction of the Owner and Engineer, at no additional cost to the Owner.

PART 4. MEASUREMENT AND PAYMENT

4.1 GENERAL

A. Measurement and payment for Contract Item 11287.1 DEPLOYABLE FLOOD GATE STRUCTURE AND STORAGE [GATE-A] shall be made at the lump sum contract unit price for the design and manufacture of Deployable Flood Gate [GATE-A], its corresponding modular storage container and associated storage pad, installed and complete in accordance with the approved shop drawings and to the locations and conditions indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; engineering design, calculations, shop drawings, shop fabrication, coatings, and product selection; excavation, subgrade preparation, and backfill; crushed stone; geotextile; delivery and placement of the modular storage container; aluminum stop logs, gaskets, base plates, anchorage, compression/clamping devices, deployable supports and bracing; installation and erection; concrete

embeds; performance of fit and leak testing; storage; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

B. Measurement and payment for Contract Item 11287.3 DEPLOYABLE FLOOD GATE STRUCTURE AND STORAGE [GATE-B] shall be made at the lump sum contract unit price for the design and manufacture of Deployable Flood Gate [GATE-B], its corresponding modular storage container and associated storage pad, installed and complete in accordance with the approved shop drawings and to the locations and conditions indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; engineering design, calculations, shop drawings, shop fabrication, coatings, and product selection; excavation, subgrade preparation, and backfill; crushed stone; geotextile; delivery and placement of the modular storage container; aluminum stop logs, gaskets, base plates, anchorage, compression/clamping devices, deployable supports and bracing; installation and erection; concrete embeds; performance of fit and leak testing; storage; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

C. Measurement and payment for Contract Item 11287.3 DEPLOYABLE FLOOD GATE STRUCTURE AND STORAGE [GATE-C] shall be made at the lump sum contract unit price for the design and manufacture of Deployable Flood Gate [GATE-C], its corresponding modular storage container and associated storage pad, installed and complete in accordance with the approved shop drawings and to the locations and conditions indicated by the Contract Drawings. This price shall include full compensation for all survey; supervision; equipment; labor; materials; testing; handling; storage; access; field verification and measurement; engineering design, calculations, shop drawings, shop fabrication, coatings, and product selection; excavation, subgrade preparation, and backfill; crushed stone; geotextile; delivery and placement of the modular storage container; aluminum stop logs, gaskets, base plates, anchorage, compression/clamping devices, deployable supports and bracing; installation and erection; concrete embeds; performance of fit and leak testing; storage; cleanup and all other incidental work necessary to complete the work under this item, as shown on the Contract Drawings, and as herein specified.

D. PAYMENT ITEMS

ITEM NO.	PAYMENT ITEM	UNIT
11287.1	DEPLOYABLE FLOOD GATE STRUCTURE AND STORAGE [GATE-A]	LUMP SUM
11287.2	DEPLOYABLE FLOOD GATE STRUCTURE AND STORAGE [GATE-B]	LUMP SUM
11287.3	DEPLOYABLE FLOOD GATE STRUCTURE AND STORAGE [GATE-C]	LUMP SUM

END OF SECTION

TECHNICAL SPECIFICATION ATTACHMENT – A1

Regulatory Authorization Documents Received as of Date of Specification Preparation:

- Town of Stratford: Connecticut Inland Wetlands & Watercourses (IWWC) Permit #2013-13
- Town of Stratford: Coastal Site Plan Review Letter
- Town of Stratford: Erosion and Sediment Control Plan Review Letter
- CT DEEP: Dam Safety Permit No. DS-202409162
- CT DEEP: NDDB Determination Letter – New Determination Number: 202302737
- CT DEEP: Flood Management Certification (License No. 202203630-FM)
- FEMA: REC for Project PDMC-PJ-010CT-2017-006 (0)

TOWN OF STRATFORD
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CONSERVATION

15 August 2025

CERTIFIED MAIL: 9589 0710 5270 1124 5198 88

John Casey, PE
Town Engineer
Town of Stratford
2725 Main Street
Stratford, Connecticut 06615

RE: IWWC Permit #2023-13
Water Pollution Control Facility
105 Beacon Point Road
Stratford, Connecticut 06614
Map 50.7, Block 3, Lot 1

Dear Applicant,

Please be advised that your Stratford Inland Wetlands application for a permit at the above-referenced property – residential condominium development -- was approved at the July 19, 2023 Regular Meeting of the Stratford Inland Wetlands Commission.

The permit document and agency findings for approval are enclosed, so please read the documents carefully to make sure you comply with all conditions. Failure to comply with the described permit conditions could result in the revocation of your permit. Please note, conditions 3 – 5 of Part I of the permit must be completed prior to commencement of work on site.

Also note that the permit will be effective 15 days after publication of the notice of decision in the Connecticut Post, which constitutes the legal appeal period. The legal notice of decision appeared in the Connecticut Post on August 11, 2023.

If you have any questions or comments regarding this matter, please contact the undersigned at the Stratford Conservation Division, 550 Patterson Avenue, Stratford, Connecticut, 06614 or by phone at (203) 385-4006.

Best regards,

Kelly F. Kerrigan
Environmental Conservation Superintendent

Enclosures (3): Permit, Legal Notice of Decision, Agency Findings

TOWN OF STRATFORD

AGENCY FINDINGS AND CONDITIONS FOR APPROVAL
FOR
STRATFORD INLAND WETLANDS APPLICATION NO. 2023-13

DATE:	**15 August 2025**
APPLICANT:	Town of Stratford 2725 Main Street Stratford, Connecticut 06615
APPLICANT'S AGENT:	GZA GeoEnvironmental, Inc. 35 Nutmeg Drive Trumbull, Connecticut 06611
PROPERTY LOCATION:	105 Beacon Point Road Stratford, Connecticut 06615
REGULATED ACTIVITY:	Flood Improvements at Water Pollution Control Facility

PLANS AND SUPPORTING DOCUMENTS:

- Full Application, Including Project Narrative
- Wetlands and Watercourse Assessment Letter Report, Prepared by GZA GeoEnvironmental, Inc., Dated June 2, 2023
- Site plans: "Water Pollution Control Facility Flood Protection System Improvements", prepared by GZA GeoEnvironmental, Inc., Dated May 2023

I. REGULATED AREA & REGULATED ACTIVITY

This 15.7-acre property is the Town of Stratford Water Pollution Control Facility along Beacon Point Road. The majority of this property includes various infrastructure in support of WPCF operations. To the west of the are two inland wetlands – one primarily a maintained lawn, while the other is dominated by common reed grass. While no direct impacts to wetlands are proposed at this time, there will be impacts within the 100' upland review area, to include: elevating the flood protection level of the existing flood levees and dikes, improvements to the existing dike section, new dike sections, new concrete L-walls which connect the dike sections, new toe drains on the landward edge of levees and dikes, deployable flood gates, and deployable flood gate material storage. Silt fencing is proposed between the wetland edge and the construction area.

TOWN OF STRATFORD

II. ANTICIPATED IMPACT

Concerns for this activity include adequate erosion and sediment controls during construction activities.

Erosion and Sediment Controls

Silt fencing will be required to be installed prior to the beginning of any on-site work.

The erosion and sediment controls will be monitored by a professional engineer or other certified party to oversee the erosion and sedimentation control program as detailed in the site plans. The erosion and sediment controls will be required to be inspected after every 1" inch rainfall or higher.

STANDARDS AND CRITERIA FOR DECISION ACCORDING TO SECTION 10.2 OF THE REGULATIONS:

a. The environmental impact of the proposed regulated activity on wetlands or watercourses:

There is no anticipated negative environmental impact of the proposed regulated activity on wetlands or watercourses. Erosion and sedimentation controls will be installed prior to construction and remain in place until the site is stabilized.

b. The applicant's purpose for, and any feasible and prudent alternatives to, the proposed regulated activity which alternatives could cause less or no environmental impact to the wetlands or watercourses.

The applicant is proposing critical infrastructure to ensure the WPCF remains operable during extreme weather conditions. No direct impacts to wetlands and watercourses are included in this project.

c. The relationship between the short-term and long-term impacts of the proposed regulated activity on wetlands or watercourses and the maintenance and enhancement of long-term productivity of such wetlands or watercourses.

Short-term impacts include the concern for soil erosion and sediment control from activity during the construction period. Injurious, long-term impacts to the wetlands are not anticipated based on the proposed application.

d. Irreversible and irretrievable loss of wetland or watercourse resources, which would be caused by the regulated activity.

There will be no net loss of wetlands or watercourses as a result of the proposed project.

e. The character and degree of injury to, or interference with safety, health, or the reasonable use of property, including abutting or downstream property, which is caused or threatened by the proposed, regulated activity, or the creation of conditions that may do so.

No interference with safety, health, or the reasonable use of the property is expected.

f. Impacts of the proposed regulated activity on wetlands or watercourses outside the area for which the activity is proposed, and future activities associated with, or reasonably related to, the proposed regulated activity, which are made inevitable by the proposed regulated activity and which may have an impact on wetlands or watercourses;

Wetlands and watercourses will not be negatively impacted.

g. Measures which would mitigate the impact of any aspect of the proposed regulated activity.

Erosion and sediment controls installed during the construction phase of the project will mitigate potential impacts to the wetlands.

AGENCY FINDINGS OF FACT

A. The IWWA Permit Application #2023-13 is for the construction of flood improvement infrastructure.

B. The applicant is the Town of Stratford.

C. The site currently is utilized as the Water Pollution Control Facility.

D. The application and supporting documents demonstrate that regulated activities will be conducted in the regulated areas (upland review area and inland wetland) as defined by the Stratford Inland Wetlands and Watercourses Regulations. The proposed residential condominium development is defined as a regulated activity under Section 2.26 of the regulations.

E. The Town of Stratford Inland Wetlands Commission held a regular meeting on July 19, 2023 and rendered a conditional approval of IWWA #2023-13.

INLAND WETLAND AGENCY DECISION

The proposed application is approved with the standard and specific conditions of approval. No significant adverse and unnecessary effects are anticipated on the regulated area as a consequence of this proposal. This decision and the appended conditions are consistent with the purposes of the Town of Stratford Inland Wetlands and Watercourses Regulations which are designed to protect the citizens of the Town of Stratford by providing a balance between the need for growth, development, and enjoyment of the natural resources of Stratford, with the need to protect its environment and ecological stability.

Best regards,

Kelly F. Kerrigan
Environmental Conservation Superintendent
Town of Stratford

TOWN OF STRATFORD
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Phone: 203-385-4006 • Fax: 203-385-4082
www.townofstratford.com
CONSERVATION

DATE: 15 August 2025

INLAND WETLANDS PERMIT 2023-13

APPLICANTS NAME: Town of Stratford

APPLICANT'S ADDRESS: 2725 Main Street, Stratford, Connecticut 06615

Dear Applicant:

This authorization refers to your application to conduct regulated activities in the Town of Stratford.

The Town of Stratford Inland Wetlands Commission has considered your application with due regard for the matters enumerated in Section 5.0 of the Regulations of the Stratford Inland Wetlands Commission and has found that the proposed work, as specified and conditioned below, conforms to the purposes and provisions of said section.

The authorized activity consists of:

Flood Improvements at Water Pollution Control Facility

Site Address: 105 Beacon Point Road, Stratford, Connecticut

Assessor's Reference: Map 50.7, Block 3, Lot 1

The permittee is responsible for completing the following conditions listed in this document. Please note that Part I conditions 2 through 7 shall be satisfied prior to any clearing or grading being completed at the site. This permit is issued subject to the following conditions and/or modifications:

Part I: Site Specific Conditions

- **Scope of Approval**: This permit is for the Site plan approved as per the regular meeting of the Stratford Inland Wetlands Commission on July 19, 2023; and includes the configuration and layout structures as indicated on the approved plans and documents as well as all permitted and regulated activities. The site plans and project documents based on this approval are entitled, S "Water Pollution Control Facility Flood Protection System Improvements", Prepared by GZA GeoEnvironmental, Inc., Dated May 31, 2023.

1. The Stratford Inland Wetland Agency's decision is detailed in the attached document entitled, *"Agency Findings and Conditions for Approval for Stratford Inland Wetland Application No. #2023-13"*

   Applicant is required to provide the agency with the full construction site plans prior to starting any land clearing or grading operations at the site.

   No Changes or modifications may be made to the scope of work as outlined in the above referenced site plans without prior consent and authorization from the Stratford Inland Wetlands Commission. Failure to receive the proper approvals for changes and/or modifications to the approved scope of work depicted on the development plans will lead to enforcement actions as described in Section 14 and Section 15 of the Stratford Inland Wetland and Watercourses Regulations.

2. **Performance Bond:** The permittee required performance bond is waived, as site activities are backed by the Town of Stratford. Regardless, the following requirements remain in effect:

   a. All areas shall be stabilized from erosion and sedimentation for one full vegetation growth season. All proposed vegetation must survive for one full vegetation growth season.

   b. All activities must be completed, including the stormwater drainage structures, utilities, and pavement.

   c. The permittee must submit an "As-built" site plan following the completion of construction. This "As-built" plan shall include topographic contours, wetland and watercourse delineations, limits of disturbance, and any other improvements to the property which has a direct or associated impact on the regulated areas, or as otherwise required by the Commission.

3. **Pre-Construction Meeting**: A pre-construction meeting shall be held with Conservation Staff, the project engineer and general contractor to discuss the installation of the erosion and sediment controls and the construction phasing prior to construction and any land clearing or grading at the Site.

4. **Construction Phasing Plan:** The project engineer in consultation with the contractor shall submit a construction-phasing plan prior to commencing construction activities at the Site. The Conservation Staff will reserve the right to change the construction schedule and the project phasing in order to protect impacts to the wetlands and watercourse.

5. **Erosion and Sediment Control Plan**: The project engineer or his designee as indicated on the approved site plans shall be responsible for implementing and overseeing the erosion and sediment control plan for the approved scope of work. The Erosion and Sediment Control Plan employed at the Site shall comply with the Best Management Practices (BMPs) as detailed in the *"2002 Connecticut Guidelines for Soil Erosion and Sediment Controls*" as may be amended.

6. **Environmental Project Monitor:** The Professional Engineer or his designated representative who is a professional in the field of erosion control (including the Professional Wetland Scientist)

shall also inspect and correct the erosion controls at least once a week during the major construction phase, and once a month thereafter, until major site work has been completed. Written compliance reports after every inspection shall be provided to the Conservation Office for the duration of the project or as requested.

Part II: Standard Conditions

1. This permit shall be in effect on **August 15, 2023** for the term of 5 years and is non-transferable without the written permission of the Stratford Inland Wetland and Watercourses Commission. Once work has commenced, the permit is valid for 5 year. Permit term expiration dates may be extended only if requested by the Permittee and approved by the IWW Commission.

2. If the authorized is not completed on or before **August 15, 2028** said activity shall cease and, if not previously revoked or specifically renewed or extended, this permit shall be null and void. Any request to renew or extend the expiration date of a permit should be filed in accordance with Section 7.11 of the Inland Wetlands & Watercourses Regulations of the Town of Stratford. Expired permits may not be renewed and the wetlands agency may require a new application for regulated activities.

3. All work and all regulated activities conducted pursuant to this authorization shall be consistent with the terms and conditions of this permit. Any structures, excavation, fill, obstructions, encroachments, or regulated activities not specifically identified and authorized herein shall constitute a violation of this permit and may result in its modification, suspension, or revocation.

4. In evaluating this application, the wetlands agency has relied on information provided by the applicant. If such information is subsequently proved to be false, incomplete or misleading, this permit may be modified, suspended or revoked and the permittee may be subject to any other remedies or penalties provided by law.

5. The permittee shall employ the best management practices, consistent with the terms and conditions of this permit, to control storm water discharge and to prevent erosion and sedimentation and to otherwise prevent pollution of wetlands and watercourses. For information and technical assistance, contact Kelly Kerrigan, Environmental Conservation Superintendent. The permittee shall immediately inform the agency of any problems involving wetland or watercourses that have developed in the course of, or that are caused by, the authorized work.

6. No equipment or material including without limitation, fill construction materials, or debris, shall be deposited, placed or stored in any regulated area on or off site unless specifically authorized by this permit.

7. This permit is subject to and does not derogate any rights or powers of the Town of Stratford, conveys no property rights or exclusive privileges and is subject to all public and private rights and to all applicable federal, state, and local laws. In conducting and maintaining any activities

authorized herein, the permittee may not cause pollution, impairment or destruction of the inland wetlands and watercourses of the Town of Stratford.

8. If the activity authorized by the inland wetlands permit also involves activity or a project that requires zoning or subdivision approval, special permit, variance or special exception, no work pursuant to the wetlands permit may begin until such approval is obtained.

9. The permittee shall maintain sediment and erosion controls at the site in such an operable condition as to prevent the pollution of wetlands and watercourses. Said controls are to be inspected by the permittee for deficiencies at least once per week and immediately after rains. The permittee shall correct any such deficiencies within 24 hours of said deficiencies being found. The permittee shall maintain such control measures until all areas of disturbed soils at the site are stabilized.

10. Additional terms of this permit are as represented by the applicant on all drawings, reports and oral statement made by or for the applicant to Stratford Inland Wetlands Commission and shall also include the following:

    a. All stumps, tree roots, matter roots, construction and demolition debris and all other solid or special waste material if encountered shall be removed from site and disposed of in a manner acceptable by State and Local laws.

    b. No debris is to be buried on site.

    c. No wetlands will be impacted, altered, modified, or engaged during the construction phase.

    d. Construction equipment shall enter and exit the site at one location only. Traffic shall be kept to a minimum.

    e. No equipment or machinery shall be stored, cleaned or repaired within 75 feet of a wetland or watercourse.

    f. No blasting shall be permitted on the property.

    g. Exposed soils shall be mulched with hay and seed.

    h. The permittee shall keep an adequate stockpile of erosion and sediment control supplies onsite during the course of the construction.

This authorization constitutes the permit required by Section 22a-42 of the Connecticut General Statutes, as amended.

Failure to comply with the conditions of this permit will subject the permittee to enforcement action, as provided for, in Section 14 (Stratford IWW Regulations).

Stratford Inland Wetlands Commission

TOWN OF STRATFORD

Signed: Kelly F. Kerrigan, Environmental Conservation Superintendent
Dated: 15 August 2025

TOWN OF STRATFORD

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CONSERVATION

TOWN OF STRATFORD
STRATFORD INLAND WETLANDS COMMISSION
LEGAL NOTICE OF DECISION

The Town of Stratford Inland Wetlands Commission held a Regular Meeting on July 19, 2023 in the Town Hall Council Chambers located at 2725 Main Street, Stratford, and rendered conditional approvals of the following applications:

2023-12: Residential Condominium Development. 600 Silver Lane. Assessor's Reference: Map 20.15, Block 1, Lot 18. Applicant: L. Edwards & Associates, LLC

2023-13: Flood Improvements at the Stratford Water Pollution Control Facility. 105 Beacon Point Road. Assessor's Reference: Map 50.17, Block 3, Lot 1. Applicant: Town of Stratford

A full record of this decisions including complete Agency Findings of Fact, is on file in the Conservation Office at 550 Patterson Avenue, Stratford, Connecticut. Any party aggrieved by this decision may file an appeal within 15 days of publication of this notice. Dated at Stratford, Connecticut this 11th day of August 2023.

Thomas J. Fahy, Chairman, Stratford Inland Wetlands Commission

This Legal Notice is to be posted in the Connecticut Post on August 11, 2023.

TOWN OF STRATFORD

Stratford Town Hall, 2725 Main Street, Stratford, CT 06615
Phone: 203-385-4017 • Fax: 203-381-6928
www.townofstratford.com

OFFICE OF PLANNING & ZONING

July 27, 2023

John Casey, Town Engineer
2725 Main St
Stratford, CT 06615

RE: 105 Beacon Point Rd – WPCF Perimeter Flood Wall Protection Project

At a public hearing held July 26, 2023, the Zoning Commission voted to approve your petition seeking a Coastal Site Plan Review to elevate the existing levees & dikes, installing flood gates & site improvements incidental to the water pollution control facility in a MC Zone

DECISION: *Approved*

REASONS:

1. As determined by the Zoning Commission, the proposed project is consistent with the environmental and sustainability goals and objectives identified in the Plan of Conservation and Development.
2. The proposed work provides better protection of the Town's critical infrastructure from flooding events.

Please contact the Office of Planning and Zoning should you have any further questions regarding this matter.

Regards,

Jay Habansky, AICP
Planning & Zoning Administrator

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OFFICE OF PLANNING & ZONING

July 27, 2023

John Casey, Town Engineer
2725 Main St
Stratford, CT 06615

RE: 105 Beacon Point Rd – WPCF Perimeter Flood Wall Protection Project

At a public hearing held July 26, 2023, the Zoning Commission voted to approve, with conditions, your petition seeking an Erosion & Sediment Controls Review to elevate the existing levees & dikes, installing flood gates & site improvements incidental to the water pollution control facility in a MC Zone

DECISION: *Approved w/ Conditions*

CONDITIONS:

1. The applicant shall obtain a letter from a licensed engineer ensuring this project's compliance with the Town of Stratford's MS4 Stormwater Permit. This letter shall be delivered/emailed to the Office of Planning and Zoning and kept in the applicant's Erosion & Sediment Controls file.
2. All necessary siltation and erosion controls shall be in place and the Zoning Enforcement Officer notified for an inspection prior to any site/construction work being performed.
3. Immediate on-site modifications shall be employed when an erosion problem develops.
4. In evaluating this application, the Commission has relied on information provided by the applicant and, if such information subsequently proves to be inaccurate or incomplete, this approval may be modified, suspended or rescinded.

Please contact the Office of Planning and Zoning should you have any further questions regarding this matter.

Regards,

Jay Habansky, AICP
Planning & Zoning Administrator

Town of Stratford
2727 Main Street
Stratford, CT 06615

Attn: John Casey – Town Engineer, jcasey@townofstratford.com

Application No.:	DS-202409162
Town:	Stratford
Waters:	Housatonic River
Permit type:	Dam Safety
Project:	Town of Stratford Water Pollution Control Facility (DEEP ID #TDB; Hazard Class: TBD)

Dear Mr. Casey:

The Commissioner of the Department of Energy and Environmental Protection has approved your application to conduct certain regulated activities. Your attention is directed to the conditions of the enclosed permit. You should read your permit carefully. Construction and other work must conform to that which is authorized. Please pay particular attention to item 16 which states conditions specific to the project site.

If you have not already done so, you should contact your local Planning and Zoning Office and the U. S. Army Corps of Engineers to determine local and federal permit requirements on your project, if any. Please mail your requests the Corps' New England District, Regulatory Branch, 696 Virginia Road, Concord, MA 01742-2751; http://www.nae.usace.army.mil/ or call 1-800-343-4789.

Please do not file the permit on the municipality's Land Records.

If you have any questions concerning your permit, please contact me at 860-874-8476 or lariab.afzaal@ct.gov.

Date: May 22, 2025

Lariab Afzaal
Lariab Afzaal, Civil Engineer II
Water Planning & Management Division

COPIES FURNISHED TO:
GZA GeoEnvironmental, Inc., 35 Nutmeg Drive, Suite 325, Trumbull, CT 06611,
Attn: David Barstow, P.E., david.barstow@gza.com
Town of Stratford Mayor's Office, Mayor Laura R. Hoydick, mayor@townofstratford.com

PERMIT

Permittee:	Town of Stratford 2725 Main Street Stratford, CT 06615 Attn: John Casey - Town Engineer, jcasey@townofstratford.com
Permit No:	DS-202409162
Town:	Stratford
Project:	Town of Stratford Water Pollution Control Facility Dike Construction & Modification (DEEP ID #TBD; Hazard Class: TBD)
Waters:	Housatonic River

Pursuant to Connecticut General Statutes Section 22a-403, the Commissioner of Energy and Environmental Protection ("Commissioner") hereby grants a permit to the Town of Stratford ("the Permittee") to conduct regulated activities associated with the Town of Stratford Water Pollution Control Facility Dike Construction and Modification. The purpose of said activities is to build a new dike.

AUTHORIZED ACTIVITY

Specifically, the permittee is authorized to do the following: increase the height of the existing dikes with additional sloped earthen embankment, construct pile-supported reinforced concrete flood walls, and install underdrains.

All activities shall be conducted in accordance with plans entitled: "Stratford WPCF Flood Protection Improvement – 100% Drawings", dated July 2024 and revised January 29, 2025; prepared by David M. Barstow, P.E., under GZA GeoEnvironmental, Inc. signed and sealed on January 29, 2025, and submitted as a part of the application.

This authorization constitutes the licenses and approvals required by Section 22a-403 of the Connecticut General Statutes. This authorization is subject to and does not derogate any present or future property rights or other rights or powers of the State of Connecticut, conveys no property rights in real estate or material nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state, or local laws or regulations pertinent to the property or activity affected thereby.

The permittee's failure to comply with the terms and conditions of this permit shall subject the permittee, including the permittee's agents or contractor(s) to enforcement actions and penalties as provided by law.

This authorization is subject to the following conditions:

CONDITIONS:

1. **Expiration.** This permit shall expire three years following the date of issue unless this permit is specifically renewed.

2. **Construction Commencement and Completion.** If construction of any structures or facilities authorized herein is not completed within three years of issuance of this permit or within such other time as may be provided by this permit, or if any activity authorized herein is not commenced within three years of issuance of this permit or within such other time as may be provided by this permit, this permit shall expire three years after issuance or at the end of such time as may be authorized by the Commissioner.

3. **Notification of Project Initiation.**
The permittee shall notify the Commissioner in writing no less than seven (7) days prior to commencement of permitted activities and no less than seven (7) days following completion of permitted activities.

4. **De minimis Alteration**. The permittee may not make any alterations, except de minimis alterations, to any structure, facility, or activity authorized by this permit. A de minimis alteration means a change in the design, construction or operation authorized under this permit that does not increase environmental impacts or substantively alter the construction of the project as authorized. If during the process of construction, unforeseen conditions are found on the site and the permittee and their engineer determine that it would be appropriate to modify the design, then the permittee shall notify DEEP within 24 hours of any potential design changes. DEEP shall determine if the design modifications will be an activity that can be categorized as a de minimis activity when compared to the permitted design. No work shall take place which was not included as part of the permitted design until DEEP responds to this determination request.

5. **Maintenance of Structures.** All structures, facilities, or activities constructed, maintained, or conducted pursuant hereto shall be consistent with the terms and conditions of this permit, and any structure, facility or activity not specifically authorized by this permit, or exempted pursuant to Section 22a-377 of the Connecticut General Statutes or Section 22a-377(b)-1 of the Regulations of Connecticut State Agencies, or otherwise exempt pursuant to other Connecticut General Statutes, shall constitute a

violation hereof which may result in modification, revocation or suspension of this permit or in the institution of other legal proceedings to enforce its terms and conditions.

6. **Accuracy of Documentation.** In issuing this permit, the Commissioner has relied on information provided by the permittee. If such information was false, incomplete, or misleading, this permit may be modified, suspended or revoked and the permittee may be subject to any other remedies or penalties provided by law.

7. **Best Management Practices & Notification of Adverse Impact**. The permittee shall utilize engineered erosion and sediment controls to prevent pollution of wetlands and watercourses in accordance with Best Management Practices. Best Management Practices include, but are not limited to, the *Connecticut Guidelines for Soil Erosion and Sediment Control*[1] as revised, the *Connecticut Stormwater Quality Manual* as revised, the Department of Transportation's *ConnDOT Drainage Manual*[2] as revised, and the Department of Transportation Standard Specifications as revised.

   The permittee shall deploy controls prior to the commencement of construction, and regularly inspect and maintain controls as needed for effectiveness. Said controls shall be inspected by the permittee for deficiencies at least once per week and immediately after each rainfall and at least daily during prolonged rainfall. The permittee shall correct any such deficiencies within forty eight (48) hours of said deficiencies being found.

   The permittee shall immediately inform the Commissioner of any adverse impact or hazard to the environment which occurs or is likely to occur as the direct result of the construction, maintenance, or conduct of structures, facilities, or activities authorized herein.

8. **Reporting of Potential Violations.**

   a. The permittee shall, no later than 48 hours after the permittee learns of a violation of this permit, report in writing to the Commissioner. Such written report shall contain the following information, and be submitted to DEEP.DamSafety@ct.gov:

      a. The provision(s) of this permit that has been violated;
      b. The date and time the violation(s) was first observed and by whom;
      c. The cause of the violation(s), if known
      d. If the violation(s) has ceased, the duration of the violation(s) and the exact date(s) and times(s) it was corrected;

[1] For guidance on the use of erosion and sediment controls, refer to the *2024 Connecticut Guidelines For Soil Erosion and Sediment Control* document. URL: sescg_cleanfinal.pdf
[2] For guidance on Stormwater Quality, refer to the *2024 Connecticut Stormwater Quality Manual. URL: Connecticut Stormwater Quality Manual*

e. If the violation(s) has not ceased, the anticipated date when it will be corrected;
f. Steps taken and steps planned to prevent a reoccurrence of the violation(s) and the date(s) such steps were implemented or will be implemented; and
g. The best telephone number where DEEP can reach the engineering consultant in a timely manner.

9. **Material Storage in the Floodplain.** The storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which could in the event of a flood be injurious to human, animal or plant life, below the elevation of the five-hundred (500) year flood is prohibited. Any other material or equipment stored at the site below said elevation by the permittee or the permittee's contractor must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel stored below such elevation for equipment used at the site shall not exceed the quantity of fuel that is expected to be used by such equipment in one day.

10. **Permit Transfer.** This permit is not transferable without the prior written consent of the Commissioner.

11. **Contractor Notification**. The permittee shall give a copy of this permit to the contractor(s) who will be carrying out the activities authorized herein prior to the start of construction and shall receive a written receipt for such copy, signed and dated by such contractor(s). The permittee's contractor(s) shall conduct all operations at the site in full compliance with this permit and, to the extent provided by law, may be held liable for any violation of the terms and conditions of this permit.

12. **Certification of Documents**. Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under this permit shall be signed by the permittee or a responsible corporate officer of the permittee, a general partner of the permittee, and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows:

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement in the submitted information may be punishable as a criminal offense in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53a-157b and in accordance with any other applicable statute."

13. **Submission of Documents**. Any document or notice required to be submitted to the Commissioner under this permit shall, unless otherwise specified in writing by the Commissioner, be directed to:

DEEP.DamSafety@ct.gov

The date of submission to the Commissioner of any document required by this permit shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under this permit, including but not limited to notice of approval or disapproval on any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the Commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means any calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

14. **Rights.** This permit is subject to and does not derogate any rights or powers of the State of Connecticut, conveys no property rights or exclusive privileges, and is subject to all public and private rights and to all applicable federal, state, and local law. In constructing or maintaining any structure or facility or conducting any activity authorized herein, the permittee may not cause pollution, impairment, or destruction of the air, water, or other natural resources of this State. The issuance of this permit shall not create any presumption that this permit should be renewed.

15. **Dam Safety Conditions**
    a. This permit and a copy of the approved plans and specifications shall be kept at the project site and made available to the Commissioner at any time during the construction of permitted activities.
    b. Permitted activities shall be performed under the supervision of an engineer who is licensed to practice in the State of Connecticut and who has expertise in dam construction. Said engineer shall, upon completion of the permitted activities, certify to the Commissioner in writing that the permitted activities have been completed according to the approved plans and specifications.
    c. Within thirty (30) days of completion of the permitted activities, permittee shall submit to the Commissioner record drawings depicting the dam construction as completed, including any deviations from the approved plans and specifications. Said drawings shall be prepared and sealed by the engineer who oversaw the construction. In addition, the permittee shall arrange for submission of an electronic copy of the final record drawings in Adobe Acrobat “pdf” format.
    d. Nothing in this chapter and no order, approval or advice of the Commissioner, shall relieve any owner or operator of this dam from his legal duties, obligations and liabilities resulting from such ownership or operation. No action for damages sustained through the partial or total failure of any structure or its maintenance

shall be brought or maintained against the state, the Commissioner of Energy and Environmental Protection, or his employees or agents.

e. The Sequence of Construction and Water Handling Plan provided in the application shall be reviewed by the contractor repairing the dam. If the plan is revised or updated, a copy of the revised plan must be submitted to the Dam Safety Program at its email address: DEEP.DamSafety@ct.gov before beginning repair or within 48 hours of its revision after the work has started.
f. The flood contingency plan submitted with the application shall be reviewed by the contractor and if any revisions are made to the plan, a copy of the revised plans must be submitted to the Dam Safety Program at DEEP.DamSafety@ct.gov within 48 hours.

16. **Protection of Eastern Box Turtle, Terrapene c. carolina.** The Permittee shall conduct the following protection strategies for the Eastern box turtle if conducting work between April 1st and November 1st:

a. A qualified herpetologist/biologist shall be hired to oversee the implementation of Eastern box turtle protection measures and procedures for the duration of the project construction. The name and contact information for the herpetologist/biologist shall be provided to the DEEP at DEEP.DamSafety@ct.gov and DEEP.Nddbrequest@ct.gov no less than 7 days prior to the start of construction,
b. Prior to the start of construction, exclusion fencing shall be installed around the limits of the work area to prevent turtle access to the work area. The exclusion fencing must be at least 20 inches tall and must be secured to and remain in contact with the ground. Silt fencing installed for erosion control may serve this like purpose. The work area includes all areas used for site access, equipment parking, material staging, material storage, and construction purposes,
c. The exclusion fencing shall be inspected each day prior to the start of work activities. Any gap or breach in the exclusionary fencing shall be fixed or repaired immediately,
d. All construction personnel and work crews shall be apprised of the species descriptions and possible presence,
e. The contractor shall search for turtles within the work area each workday prior to the start of any work activities,
f. Any turtles that are encountered within the limits of the work area shall be carefully moved, unharmed, to an area immediately outside of the fenced work area and shall be released oriented to head in the same direction as it was found,
g. All exclusion fencing shall be removed immediately after completion of the project. All soil erosion control fencing shall be removed as soon as soil stabilization is completed

Issued by the Commissioner of Energy and Environmental Protection on:

May 21, 2025
Date

Graham J. Stevens
Bureau Chief
Water Protection and Land Reuse

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

Generated by eNDDB on:
3/28/2023

Cora Ottaviani
STRATFORD
2725 MAIN ST
STRATFORD, CT 06615
cora.ottaviani@gza.com

Subject: Stratford WPCF Flood Wall Improvements
Filing # 96807
NDDB – New Determination Number: 202302737
105 Beacon Point Road
Stratford

Expiration Date: 3/28/2025

Current data maintained by the Natural Diversity Database (NDDB) and housed in the DEEP ezFile portal indicates that populations of the following State Endangered, Threatened, or Special Concern species (RCA Sec. 26-306) have been documented within the project area or in close proximity to the proposed Dams/Repair/modification of Dam Without Drawdown, Stratford WPCF Flood Wall Improvements.

Eastern box turtle (*Terrapene carolina carolina*)

In accordance with the project information provided in your request submittal, implementation of the following Best Management Practices will avoid negative impacts to listed species:

Common Name	Eastern box turtle
Scientific Name	*Terrapene carolina carolina*
Taxa	reptile
Status[1]	SC
General Ecology	In Connecticut, these turtles are found in well-drained forest bottomlands and a matrix of open deciduous forests, early successional habitat, fields, gravel pits, and or powerlines. Turtles are dormant between November 1 and April 1 and hibernate in only a few inches from the surface in forested habitat. The greatest threat to this species is habitat loss, fragmentation, and degradation due to development. This species is very sensitive to adult mortality because of late maturity (10 years old) and long life span (50-100years). Vehicular traffic, heavy equipment used for farming, and ATV use in natural areas are implicated specifically in adult mortality through collisions. Illegal collection by the pet trade and unknowing public for home pets exacerbates mortality rates and removes important individuals from the population. Predation rates are also unnaturally high because of increased predator populations (e.g. skunks, foxes, raccoons, and crows) that surround developed areas.
Best Management Practice	**Land disturbance activities need to consider local habitat features and apply fencing and/or time of year restrictions as appropriate. We recommend you consult with a**

	herpetologist familiar with preferred habitats to assist you with proper techniques to ensure the best protection strategies are employed for your site and the scope of your project. **To prevent turtle access and entry into your work zone between April 1- November 1:** **• Exclusionary practices will be used to prevent any turtle access into disturbance areas. These measures will need to be installed at the limits of disturbance as shown on the plans, or specifically designated by a herpetologist who can assess the conditions at your site.** **• Exclusionary fencing be at least 20 in tall and must be secured to and remain in contact with the ground and be regularly maintained (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let animal pass through.** **• All staging and storage areas, outside of previously paved locations, regardless of the duration of time they will be utilized, must be reviewed to remove individuals and exclude them from re-entry.** **• All construction personnel working within the turtle habitat must be apprised of the species description and the possible presence of a listed species.** **• The Contractor search the work area each morning prior to any work being done.** **• Any turtles encountered within the immediate work area shall be carefully moved to an adjacent area outside of the excluded area and fencing should be inspected to identify and remove access point. This animal is protected by law and should not be relocated off-site.** **• In areas where silt fence is used for exclusion, it shall be removed as soon as the area is stable and disturbance is finished to allow for reptile and amphibian passage to resume.** **If land disturbance will occur in suitable overwintering forested habitat you will need to take precautions to avoid mortality of hibernating adults. If practicable, small projects, under the supervision of a qualified herpetologist, may be able to utilize a combination of exclusionary fencing installed before October 15, combined with and surveys to ensure that no turtles are within the enclosed fencing. Work can then be conducted within the fenced area at any time of year as long as the fencing is maintained. Projects that will impact large blocks of forest or significant overwintering habitat may need to restrict your land disturbance activities in forested habitat to the turtle active season. These projects would need to restrict land disturbance activities to occur only between April 1- October 31.**

[1]E = State Endangered, T = State Threatened, SC = State Special Concern, FE = Federally Endangered, FT = Federally Threatened, NA = Not applicable.

Your submission information indicates that your project requires a state permit, license, registration, or authorization, or utilizes state funding or involves state agency action. This NDDB – New determination may be utilized to fulfill the Endangered and Threatened Species requirements for state-issued permit applications, licenses, registration submissions, and authorizations.

Please be aware of the following limitations and conditions:

Natural Diversity Database information includes all information regarding listed species available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units

of DEEP, land owners, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as enhance existing data. Such new information is incorporated into the Database and accessed through the ezFile portal as it becomes available. New information may result in additional review, and new or modified restrictions or conditions may be necessary to remain in compliance with certain state permits.

- During your work listed species may be encountered on site. A report must be submitted by the observer to the Natural Diversity Database promptly and additional review and restrictions or conditions may be necessary to remain in compliance with certain state permits. Please fill out the appropriate survey form and follow the instructions for submittal.
- Your project involves the state permit application process or other state involvement, including state funding or state agency actions; please note that consultations with your permit analyst or the agency may result in modifications or additional requirements. In this situation, additional evaluation of the proposal by the DEEP Wildlife Division may be necessary and additional information, including but not limited to species-specific site surveys, may be required.
- If your project involves preparing an Environmental Impact Assessment, this NDDB consultation and determination should not be substituted for conducting biological field surveys assessing on-site habitat and species presence.
- This determination applies only to the project as described in the submission and summarized at the end of this letter. Please re-submit an updated Request for Review if the project's scope of work and/or timeframe changes, including if work has not begun by 3/28/2025.
- If biological surveys have been conducted in accordance with Best Management Practices provided, please forward a copy of the results to the address listed at the end of this letter. Include the Project Name and Determination Number on all correspondence.

The NDDB – New determination for the Stratford WPCF Flood Wall Improvements at 105 Beacon Point Road, Stratford, as described in the submitted information and summarized at the end of this document is valid until 3/28/2025. This determination applies only to the project as described in the submission and summarized at the end of this letter. Please re-submit an updated Request for Review if the project's scope of work and/or timeframe changes, including if work has not begun by 3/28/2025.

This letter is computer generated and carries no signature. If however, any clarification is needed, or, if you have further questions, please contact the following:

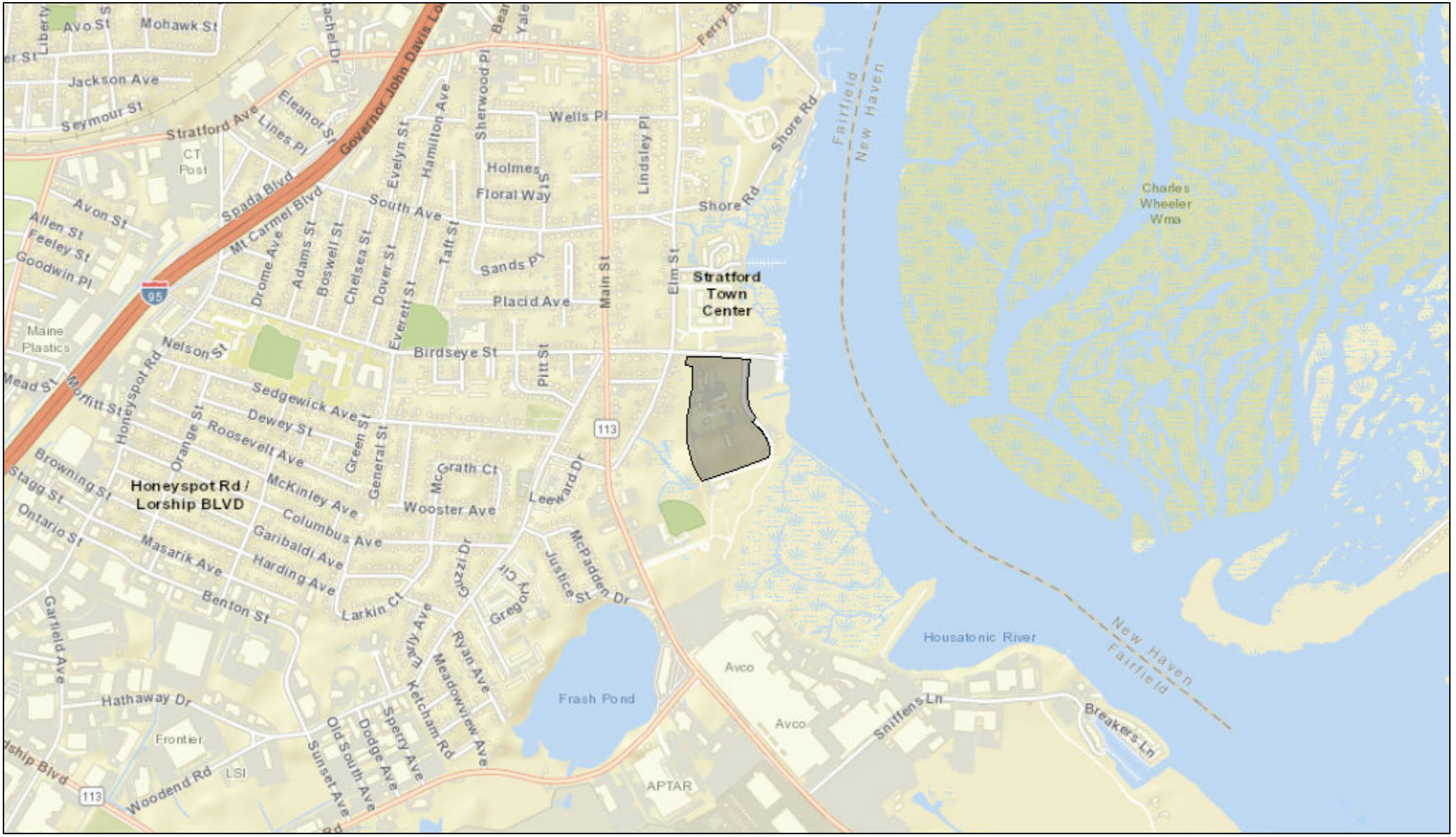
CT DEEP Bureau of Natural Resources
Wildlife Division
Natural Diversity Database, 6th floor
79 Elm Street,
Hartford, CT 06106-5127
(860) 424-3011
deep.nddbrequest@ct.gov

Please reference the Determination Number provided in this letter when you e-mail or write. Thank you for submitting your project through DEEP's ezFile portal for Natural Diversity Database reviews.

Application Details:

Project involves federal funds or federal permit:	Yes
Project involves state funds, state agency action, or relates to CEPA request:	No
Project requires state permit, license, registration, or authorization:	Yes
DEEP enforcement action related to project:	
Project Type:	Dams
Project Sub-type:	Repair/modification of Dam Without Drawdown
Project Name:	Stratford WPCF Flood Wall Improvements
Project Description:	

Stratford WPCF Flood Wall Improvements Map



March 28, 2023

1:19,195

0 0.15 0.3 0.6 mi

0 0.25 0.5 1 km

Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Connecticut Department of Energy and Environmental Protection License*

Flood Management Certification Approval

Licensee(s):	CT Division of Emergency Management & Homeland Security
Licensee Address(s):	1111 Country Club Road Middletown, CT 06457
License Number(s):	202203630-FM
Municipality:	Statewide
Project Description:	Eligible mitigation projects under the FEMA Hazard Mitigation Assistance Grant Programs within regulated floodplain areas.
Project Address/Location:	Statewide
Waters:	Statewide
Authorizing CT Statute(s) and/or Federal Law:	CGS Section 25-68b to h
Applicable Regulations of CT State Agencies:	25-68h-1 to 3
Agency Contact:	Land & Water Resources Division, Bureau of Water Protection & Land Reuse, 860-424-3019
License Expiration:	Ten (10) years from the date of issuance of this license.
Project Site Plan Set:	N/A
License Enclosures:	LWRD General Conditions; Compliance Form A; Compliance Form B; Application Attachment A: Executive Summary

Authorized Activities:

The Licensee is hereby authorized to conduct the following work as described in Attachment A of Application # 202203630. There are ten types of activities which may occur throughout the state:

1. Property Acquisition and Structure Demolition;

*Connecticut's Uniform Administrative Procedure Act defines License to include, "*the whole or part of any agency permit, certificate, approval, registration, charter or similar form of permission required by law . . .*"

2. Property Acquisition and Structure Relocation;
3. Structure Elevation;
4. Mitigation Reconstruction;
5. Generator Use;
6. Localized Flood Risk Reduction Projects;
7. Nonlocalized Flood Risk Reduction Projects;
8. Infrastructure Retrofit;
9. Soil Stabilization; and,
10. Miscellaneous/Other.

Failure to comply with the terms and conditions of this license shall subject the Licensee and / or the Licensee's contractor(s) to enforcement actions and penalties as provided by law.

This license is subject to the following Terms and Conditions:

1. **License Enclosure(s) and Conditions.** The Licensee shall comply with all applicable terms and conditions as may be stipulated within the License Enclosure(s) listed above.
2. **Eligible Projects/Activities & Design Requirements.** Eligible projects/activities are described in more detail in Application Attachment A, attached hereto. Projects/activities must be designed in accordance with requirements stipulated therein.
3. **Additional Activity Restrictions.** Activity/activities that involve the construction of any new structure within the 100-year or 500-year floodplain are prohibited under this general certification. Activity/activities carried out under this certification shall not promote or encourage future development within a floodplain and shall not change the use of the property from an activity to a critical activity.
4. **Document Submittal Requirements.** DESPP/DEMHS and any sub-applicant(s) as applicable shall submit documentation in accordance with the process outlined in Application Attachment A, attached hereto.

Issued under the authority of the Commissioner of Energy and Environmental Protection on:

May 24, 2022
Date

Brian P. Thompson
Division Director
Land & Water Resources Division

LWRD General Conditions

1. **Land Record Filing (for *Structures Dredging & Fill*, *Tidal Wetlands*, *Certificate of Permission*, and *Long Island Sound General Permit* Licenses only).** The Licensee shall file the Land Record Filing on the land records of the municipality in which the subject property is located not later than thirty (30) days after license issuance pursuant to Connecticut General Statutes (CGS) Section 22a-363g. A copy of the Notice with a stamp or other such proof of filing with the municipality shall be submitted to DEEP.LWRDRegulatory@ct.gov no later than sixty (60) days after license issuance. If a Land Record Filing form is not enclosed and the work site is not associated with an upland property, no filing is required.

2. **Contractor Notification.** The Licensee shall give a copy of the license and its attachments to the contractor(s) who will be carrying out the authorized activities prior to the start of construction and shall receive a written receipt for such copy, signed and dated by such contractor(s). The Licensee's contractor(s) shall conduct all operations at the site in full compliance with the license and, to the extent provided by law, may be held liable for any violation of the terms and conditions of the license. At the work site, the contractor(s) shall, whenever work is being performed, have on site and make available for inspection a copy of the license and the authorized plans.

3. **Work Commencement[1].** Not later than two (2) weeks prior to the commencement of any work authorized herein, the Licensee shall submit to DEEP.LWRDRegulatory@ct.gov, on the Work Commencement Form attached hereto, the name(s) and address(es) of all contractor(s) employed to conduct such work and the expected date for commencement and completion of such work, if any.
    - For water diversion activities authorized pursuant to 22a-377(c)-1 of the Regulations of Connecticut State Agencies, the Licensee shall also notify the Commissioner in writing two weeks prior to initiating the authorized diversion.
    - For emergency activities authorized pursuant Connecticut General Statutes Section 22a-6k, the Licensee shall notify the Commissioner, in writing, of activity commencement at least one (1) day prior to construction and of activity completion no later than five (5) days after conclusion.

4. **For Coastal Licenses Only - License Notice.** The Licensee shall post the first page of the License in a conspicuous place at the work area while the work authorized therein is undertaken.

5. **Unauthorized Activities.** Except as specifically authorized, no equipment or material, including but not limited to, fill, construction materials, excavated material or debris, shall be

[1] The Work Commencement condition and the need for a Work Commencement Form is not applicable to Flood Management Certification approvals.

deposited, placed or stored in any wetland or watercourse on or off-site. The Licensee may not conduct work within wetlands or watercourses other than as specifically authorized, unless otherwise authorized in writing by the Commissioner. Tidal wetlands means "wetland" as defined by section 22a-29 and "freshwater wetlands and watercourses" means "wetlands" and "watercourses" as defined by section 22a-38.

6. **Management of Materials.** Any materials removed from the site shall be managed in accordance with all federal, state, and local requirements, including Chapter 446K Water Pollution Control, Chapter 445 Hazardous Waste, and Chapter 446d Solid Waste of the Connecticut General Statutes.

7. **Unconfined Instream Work.** Unless otherwise noted in a condition of the license, the following conditions apply to projects in non-coastal waters:

   - Unconfined instream work is limited to the period June 1 through September 30.
   - Confinement of a work area by cofferdam techniques using sand bag placement, sheet pile installation (vibratory method only), portadam, or similar confinement devices is allowed any time of the year. The removal of such confinement devices is allowed any time of the year.
   - Once a work area has been confined, in-water work within the confined area is allowed any time of the year.
   - The confinement technique used shall completely isolate and protect the confined area from all flowing water. The use of silt boom/curtain or similar technique as a means for confinement is prohibited.

8. **For State Actions Only - Material or Equipment Storage in the Floodplain.** Unless approved by a Flood Management Exemption, the storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which could in the event of a flood be injurious to human, animal or plant life, below the elevation of the five-hundred (500) year flood is prohibited. Any other material or equipment stored at the site below said elevation by the Licensee or the Licensee's contractor must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel stored below such elevation for equipment used at the site shall not exceed the quantity of fuel that is expected to be used by such equipment in one day. In accordance with the licensee's Flood Contingency Plan, the Licensee shall remove equipment and materials from the floodplain during periods when flood warnings have been issued or are anticipated by a responsible federal, state or local agency. It shall be the Licensee's responsibility to obtain such warnings when flooding is anticipated.

9. **Temporary Hydraulic Facilities for Water Handling.** If not reviewed and approved as a part of the license application, temporary hydraulic facilities shall be designed by a qualified professional and in accordance with the *Connecticut Guidelines for Soil Erosion and Sediment Control*, the *2004 Connecticut Stormwater Quality Manual*, or the *Department of Transportation's ConnDOT Drainage Manual,* as applicable. Temporary hydraulic facilities may include channels, culverts or bridges which are required for haul roads, channel relocations, culvert installations, bridge construction, temporary roads, or detours.

10. **Excavated Materials.** Unless otherwise authorized, all excavated material shall be staged and managed in a manner which prevents additional impacts to wetlands and watercourses.

11. **Best Management Practices.** The Licensee shall not cause or allow pollution of any wetlands or watercourses, including pollution resulting from sedimentation and erosion. In constructing or maintaining any authorized structure or facility or conducting any authorized activity, or in removing any such structure or facility, the Licensee shall employ best management practices to control storm water discharges, to prevent erosion and sedimentation, and to otherwise prevent pollution of wetlands and other waters of the State. For purposes of the license, "pollution" means "pollution" as that term is defined by CGS section 22a-423. Best Management Practices include, but are not limited, to practices identified in the *Connecticut Guidelines for Soil Erosion and Sediment Control* as revised, *2004 Connecticut Stormwater Quality Manual*, Department of Transportation's *ConnDOT Drainage Manual* as revised, and the Department of Transportation Standard Specifications as revised.

12. **In-Water Work Vessel Staging and Storage. (for Structures Dredging & Fill, Tidal *Wetlands*, *Certificate of Permission*, and *Long Island Sound General Permit* Licenses only).** For any barge, vessel, skiff or floating work platform ("work vessels") utilized in the execution of the work authorized herein, the Licensee shall ensure that such work vessels:
    - do not rest on, or come in contact with, the substrate at any time, unless specifically authorized in the license.
    - are not stored over intertidal flats, submerged aquatic vegetation or tidal wetland vegetation or in a location that interferes with navigation. In the event any work vessel is grounded, no dragging or prop dredging shall occur to free it.

13. **Work Site Restoration.** Upon completion of any authorized work, the Licensee shall restore all areas impacted by construction, or used as a staging area or accessway in connection with such work, to their condition prior to the commencement of such work.

14. **Inspection.** The Licensee shall allow any representative of the Commissioner to inspect the project location at reasonable times to ensure that work is being or has been conducted in accordance with the terms and conditions of this license.

15. **Change of Use. (Applies only if a use is specified within the License "*Project Description*")**
    a. The work specified in the license is authorized solely for the purpose set forth in the license. No change in purpose or use of the authorized work or facilities as set forth in the license may occur without the prior written approval of the Commissioner. The Licensee shall, prior to undertaking or allowing any change in use or purpose from that which is authorized by this license, request permission from the Commissioner for such change. Said request shall be in writing and shall describe the proposed change and the reason for the change.

    b. A change in the form of ownership of any structure authorized herein from a rental/lease commercial marina to a wholly-owned common interest community or dockominium may constitute a change in purpose as specified in paragraph (a) above.

16. **De Minimis Alteration.** The Licensee shall not deviate from the authorized activity without

prior written approval from the Commissioner. The Licensee may request a de minimis change to any authorized structure, facility, or activity. A de minimis alteration means a change in the authorized design, construction or operation that individually and cumulatively has minimal additional environmental impact and does not substantively alter the project as authorized.

- For diversion activities authorized pursuant to 22a-377(c)-2 of the Regulations of Connecticut State Agencies, a de minimis alteration means an alteration which does not significantly increase the quantity of water diverted or significantly change the capacity to divert water.

17. **Extension Request.** The Licensee may request an extension of the license expiration date. Such request shall be in writing and shall be submitted to DEEP.LWRDRegulatory@ct.gov at least thirty (30) days prior to the license expiration. Such request shall describe the work done to date, what work still needs to be completed, and the reason for such extension. The Commissioner may extend the expiration date of this license for a period of up to one year, in order for the Licensee to complete the authorized activities. It shall be at the Commissioner's sole discretion to grant or deny such request. No more than three (3) one-year extensions will be granted under this license.

18. **Compliance Certification.** Not later than 90 days after completion of the authorized work, the Licensee shall prepare and submit to DEEP.LWRDRegulatory@ct.gov, the attached Compliance Certification Form. Such Compliance Certification shall be completed, signed, and sealed by the Licensee and a Connecticut Licensed Design Professional. If non-compliance is indicated on the form, or the Commissioner has reason to believe the activities and/or structures were conducted in non-compliance with the license, the Commissioner may require the Licensee to submit as-built plans as a condition of this license.

19. **Maintenance.** The Licensee shall maintain all authorized structures or work in optimal condition or shall remove such structures or facility and restore the affected waters to their pre-work condition. Any such maintenance or removal activity shall be conducted in accordance with applicable law and any additional approvals required by law.

20. **No Work After License Expiration.** Work conducted after the license expiration date is a violation of the license and may subject the licensee to enforcement action, including penalties, as provided by law.

21. **License Transfer.** The license is not transferable without prior written authorization of the Commissioner. A request to transfer a license shall be submitted in writing and shall describe the proposed transfer and the reason for such transfer. The Licensee's obligations under the license shall not be affected by the passage of title to the license site to any other person or municipality until such time as a transfer is approved by the Commissioner.

22. **Document Submission.** Any document required to be submitted to the Commissioner under the license or any contact required to be made with the Commissioner shall, unless otherwise specified in writing by the Commissioner, be directed to:

    DEEP.LWRDRegulatory@ct.gov or

Regulatory Section
Land & Water Resources Division
Department of Energy and Environmental Protection
79 Elm Street
Hartford, Connecticut 06106-5127
860-424-3019

23. **Date of Document Submission.** The date of submission to the Commissioner of any document required by the license shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under the license, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three (3) days after it is mailed by the Commissioner, whichever is earlier. Except as otherwise specified in the license, the word "day" as used in the license means calendar day. Any document or action which is required by the license to be submitted or performed by a date which falls on a Saturday, Sunday or a Connecticut or federal holiday shall be submitted or performed on or before the next day which is not a Saturday, Sunday, or a Connecticut or federal holiday.

24. **Certification of Documents.** Any document, including but not limited to any notice, which is required to be submitted to the Commissioner under the license shall be signed by the Licensee and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments and certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief, and I understand that any false statement made in this document or its attachments may be punishable as a criminal offense."

25. **Accuracy of Documentation.** In evaluating the application for the license, the Commissioner has relied on information and data provided by the Licensee and on the Licensee's representations concerning site conditions, design specifications and the proposed work, including but not limited to representations concerning the commercial, public or private nature of the work or structures, the water-dependency of said work or structures, its availability for access by the general public, and the ownership of regulated structures or filled areas. If such information proves to be false, deceptive, incomplete or inaccurate, the license may be modified, suspended or revoked, and any unauthorized activities may be subject to enforcement action.

26. **Limits of Liability.** In granting the license, the Commissioner has relied on all representations of the Licensee, including information and data provided in support of the Licensee's application. Neither the Licensee's representations nor the issuance of the license shall constitute an assurance by the Commissioner as to the structural integrity, the engineering feasibility or the efficacy of such design.

27. **Reporting of Violations.** In the event that the Licensee becomes aware that they did not or may not comply, or did not or may not comply on time, with any provision of this license or of any document incorporated into the license, the Licensee shall immediately notify the

agency contact specified within the license and shall take all reasonable steps to ensure that any noncompliance or delay is avoided or, if unavoidable, is minimized to the greatest extent possible. In so notifying the agency contact, the Licensee shall provide, for the agency's review and written approval, a report including the following information:

a. the provision(s) of the license that has been violated;

b. the date and time the violation(s) was first observed and by whom;

c. the cause of the violation(s), if known;

d. if the violation(s) has ceased, the duration of the violation(s) and the exact date(s) and times(s) it was corrected;

e. if the violation(s) has not ceased, the anticipated date when it will be corrected;

f. steps taken and steps planned to prevent a reoccurrence of the violation(s) and the date(s) such steps were implemented or will be implemented; and

g. the signatures of the Licensee and of the individual(s) responsible for actually preparing such report.

If the violation occurs outside of normal business hours, the Licensee shall contact the Department of Energy and Environmental Protection Emergency Dispatch at 860-424-3333. The Licensee shall comply with any dates which may be approved in writing by the Commissioner.

28. **Revocation/Suspension/Modification.** The license may be revoked, suspended, or modified in accordance with applicable law.

29. **Other Required Approvals.** License issuance does not relieve the Licensee of their obligations to obtain any other approvals required by applicable federal, state and local law.

30. **Rights.** The license is subject to and does not derogate any present or future property rights or powers of the State of Connecticut, and conveys no property rights in real estate or material nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the property or activity affected hereby.

31. **Condition Conflicts.** In the case where a project specific special condition listed on the license differs from, or conflicts with, one of the general conditions listed herein, the project specific special condition language shall prevail. It is the licensee's responsibility to contact the agency contact person listed on the license for clarification if needed prior to conducting any further regulated activities.

State of Connecticut
Department of Emergency Services and Public Protection
Division of Emergency Management and Homeland Security
July 2021

Flood Management General Certification for Certain Program Activities Under the FEMA Hazard Mitigation Assistance Grant Programs

Attachment A – Executive Summary

The Department of Emergency Services and Public Protection/Division of Emergency Management and Homeland Security (DESPP/DEMHS) is seeking approval for certain activities that are eligible mitigation projects under the FEMA Hazard Mitigation Assistance Grant Programs within regulated floodplain areas. The regulated floodplain areas are zones: A, AE, V, VE, B and X as defined by the National Flood Insurance Program (NFIP). "Critical activities" (as defined below) located in a Zone B or Zone X (shaded) are regulated under Connecticut General Statutes (CGS) Chapter 476a, Section 25-68.

Proposed activities identified under this Flood Management General Certification are to be designed in compliance with the flood management requirements of CGS Section 25-68d(b) and Sections 25-68h-1 and 25-68h-3 of the Regulations of Connecticut State Agencies (RCSA).

This Flood Management General Certification is for certain program activities in regulated floodplains across the State and is for a ten-year period from the date of signature approval from the State of Connecticut's Department of Energy and Environmental Protection (DEEP). This General Certification may be amended within the five-year period to reflect changes in the federal program and shall not prevent DESPP/DEMHS for applying for an exemption from the provisions of subsection (b) of the CGS Section 25-68d and RCSA Section 25-68h-1 through 25-68h-3, inclusive, in accordance with the procedures described under subsection (d) of CGS Section 25-68d, if appropriate.

General Statutes of Connecticut, Chapter 476a Flood Management, Section 25-68b. Definitions.

(1) ***Activity*** means any proposed state action in a floodplain or any proposed state action that impacts natural or man-made storm drainage facilities that are located on property that the commissioner [DEEP] determines to be controlled by the state;

(2) ***Base flood*** means that flood which has a one per cent chance of being equaled or exceeded in any year, as defined in regulations of the National Flood Insurance Program (44 CFR 59 et seq.) or that flood designated by the commissioner [DEEP] pursuant to section 25-68c. Any flood so designated by the commissioner shall have at least a one per cent chance of being equaled or exceeded in any year. Such flood may be designated as the A/AE or V/VE zones on maps published by the National Flood Insurance Program. The ***"base flood for a critical activity"*** means the flood that has at least a .2 per cent chance of being equaled or exceeded in any year. Such flood may be designated as the B zone on maps published for the National Flood Insurance Program;

(3) ***Commissioner*** means the Commissioner of Energy and Environmental Protection [DEEP];

(4) ***Critical Activity*** means any activity, including, but not limited to, the treatment, storage and disposal of hazardous waste and the siting of hospitals, housing for the elderly, schools or residences, in the .2 percent floodplain in which the commissioner [DEEP] determines that a slight chance of flooding is too great;

(5) ***Floodplain*** means that area located with real or theoretical limits of the base flood or base flood for a critical activity;

(6) ***Flood-proofing*** means any combination of structural or nonstructural additions, changes or adjustments which reduce or eliminate flood damage to real estate or improved real property, to water and sanitary facilities, and to structures and their contents, including, but not limited to, for properties within the coastal boundary, as established pursuant to subsection (b) of section 22a-94, not less than an additional two feet of freeboard above base flood and any additional freeboard necessary to account for the most recent sea level change scenario updated pursuant to subsection (b) of section 25-68o;[1]

(7) ***Freeboard*** means a safety factor, expressed in feet above a calculated flood level, that compensates for unknown factors contributing to flood heights greater than calculated height, including but not limited to, ice jams, debris accumulations, wave actions, obstructions of bridge openings and floodways, the effects of urbanization on the hydrology of a watershed, loss of flood storage due to development and sedimentation of a watercourse beds;

(8) ***Proposed state action*** means an individual activity or a sequence of planned activities proposed to be undertaken by a state department, institution or agency, any state or federal grant or loan proposed to be used to fund a project that affect land use, or proposed transfer of real property belonging to the state.

Calculation of the 500-year Flood Elevation in a FEMA Designated Coastal Flood Hazard Area

As defined by Connecticut General Statute Section 25-65b (4), *critical activities* are regulated to the 500-year Base Flood Event when applying under this General Certification. Since data on the Coastal 500-year BFE is not available, the State of Connecticut's Department of Energy and Environmental Protection has indicated that the Coastal 500-year BFE can be approximated by multiplying the 100-year BFE by 1.25.

Roles and Responsibilities in administering the HMA Programs

DESPP/DEMHS is the State point of contact for FEMA's Hazard Mitigation Assistance Grant Programs and is designated to administer the HMA programs. DESPP/DEMHS is the eligible Applicant for HMA programs.

FEMA's Hazard Mitigation Assistance Guidance: Hazard Mitigation Grant program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program, dated February 27, 2015, defines the Roles and Responsibilities associated with the administration of the HMA Grants. In summary, DESPP/DEMHS solicits sub-applications from eligible entities, usually municipalities, and assists in the preparation, review and submission of these applications to FEMA. If the application involves an individual's home, the municipality/sub-applicant is responsible for managing the sub-award and complying with program requirements and other applicable federal, State, territorial, tribal, and local laws and regulations.

[1] Connecticut General Statutes, Chapter 476a, "Flood Management". Sec. 25-68b. *Definitions*. https://www.cga.ct.gov/current/pub/chap_476a.htm#sec_25-68b

Types of Hazard Mitigation Activities eligible under this General Certification

The HMA Programs include the following: Hazard Mitigation Grant Program (HMGP); Flood Mitigation Assistance Program (FMA); Pre-Disaster Mitigation Program (PDM), and Building Resilient Infrastructure in Communities (BRIC). Each of these programs was authorized by separate federal legislative action; each program differs slightly in scope and intent. These programs provide significant opportunities to reduce or eliminate potential losses through hazard mitigation planning and project grant funding.

- HMGP is authorized by Section 404 of the Stafford Act, 42 U.S.C. 5170c. The purpose of this Program is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster.

- FMA is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 4104c, with the goal of reducing or eliminating claims under the National Flood Insurance Program. FMA funding is available through the National Flood Insurance Fund (NFIF) for flood hazard mitigation projects, as well as plan development.

- PDM is authorized by the Stafford Act, 42 U.S.C. 5133. PDM is designed to assist states, federally recognized tribes and local communities to implement a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on federal funding in future disasters.

- BRIC is authorized by Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended (Pub. L. No. 93-288) (42 U.S.C. § 5133) as implemented by Hazard Mitigation Assistance: Building Resilient Infrastructure and Communities (FP: 104-008-05). The Building Resilient Infrastructure and Communities (BRIC) program makes federal funds available to states, U.S territories, Indian tribal governments, and local communities for pre-disaster mitigation activities.

FEMA's Hazard Mitigation Assistance Guidance: Hazard Mitigation Grant program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program, dated February 27, 2015, as updated and revised, identifies eligible activities per program. The following narrative describes the types of activities/projects that are eligible under the FEMA grant programs and which are covered under this *Flood Management General Certification*:

1. **Property Acquisition and Structure Demolition:** The voluntary acquisition of an existing flood-prone structure and, typically, the underlying land, and conversion of the land to open space through the demolition of the structure. The property must be deed-restricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions.
2. **Property Acquisition and Structure Relocation:** The voluntary physical relocation of an existing structure to an area outside of a hazard-prone area, such as the Special Flood Hazard Area (SFHA) or a regulatory erosion zone and, typically, the acquisition of the underlying land. Relocation must conform to all applicable State and local regulations. The property must be deed-restricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions.
3. **Structure Elevation:** Physically raising and/or retrofitting an existing structure in accordance with ASCE 24-14 (Base Flood Elevation [BFE] plus freeboard) or higher when required by FEMA or local ordinance. Elevation may be achieved through a variety of methods, including elevating on continuous foundation

walls; elevating on open foundations, such as piles, piers, posts, or columns; and elevating on fill. Foundations must be designed to properly address all loads and be appropriately connected to the floor structure above, and utilities must be properly elevated as well. FEMA requires Recipients and sub-recipients of grants to design all structure elevation projects in accordance with ASCE 24-14. For the purposes of this general certification the Base Flood Elevation for raising a structure is the 500-year storm event.

4. **Mitigation Reconstruction:** The construction of an improved, elevated building on the same site where an existing building and/or foundation has been partially or completely demolished or destroyed. Mitigation reconstruction is only permitted for structures outside of the regulatory floodway or Coastal High Hazard Area (Zone VE) and Coastal AE zones within the Limit of Moderate Wave Action (LiMWA) Line as identified by the existing best available flood hazard data. Activities that result in the construction of new living space at or above the BFE will only be considered when consistent with mitigation reconstruction requirements. FEMA requires Recipients and sub-recipients of grants to design all mitigation reconstruction projects in accordance with ASCE 24-14. For the purposes of this general certification the Base Flood Elevation for raising a structure is the 500-year storm event.
5. **Generators:** Generators are emergency equipment that provides a secondary source of power. Generators and related equipment (e.g., hook-ups) are eligible provided that they are cost effective, contribute to a long-term solution to the problem they are intended to address, and meet other program eligibility criteria.
6. **Localized Flood Risk Reduction Projects:** Projects to lessen the frequency or severity of flooding, and decrease predicted flood damage, within an isolated and confined drainage or catchment area that is not hydraulically linked or connected to a larger basin. These projects include but are not limited to installation or modification of culverts and other stormwater management facilities; construction or modification of retention and detention basins; and construction or modification of floodwalls, dams, and weirs. Modifications must be for the purpose of increasing risk reduction capabilities of the existing structures and cannot constitute only repairs. Localized flood risk reduction projects must not duplicate the flood prevention activities of other Federal agencies and may not constitute a section of a larger flood control system.
7. **Non-localized Flood Risk Reduction Projects:** Projects that lessen the frequency or severity of flooding, and decrease predicted flood damage, within an area that is hydraulically linked or connected to a drainage basin that is regional in scale. These projects reduce flood hazards in areas larger than that of localized flood reduction projects and may include the: construction or modification of, seawalls, groins, jetties, breakwaters, and stabilized sand dunes. Modifications must be for the purpose of increasing risk reduction capabilities of the existing structures and cannot constitute only repairs. These projects cannot constitute a section of a larger flood control system or duplicate the flood prevention activities of other Federal agencies on the same site.
8. **Infrastructure Retrofit:** Measures to reduce risk to existing utility systems, roads, and bridges.
9. **Soil Stabilization:** Projects to reduce risk to structures or infrastructure from erosion and landslides, including installing geotextiles, stabilizing sod, installing vegetative buffer strips, preserving mature vegetation, decreasing slope angles, and stabilizing with rip rap and other means of slope anchoring. These projects must not duplicate the activities of other Federal agencies.
10. **Community/Capacity Building Activities**: "C&CB [capability- and capacity-building] activities must result in a resource, strategy, or tangible mitigation product that will reduce or eliminate risk and damage from future natural hazards, increase resiliency, and promote a culture of preparedness."
11. **Miscellaneous/Other:** FEMA encourages Applicants and sub-applicants to pursue activities that best address mitigation planning and priorities in their community; however, these eligible activities are not limited to those that are described under Part III, E of the *HMA Guidance*. FEMA encourages mitigation

projects that fall into the Miscellaneous/Other category to address climate change adaptation and resiliency. Mitigation projects must adapt to new challenges posed by more powerful storms, frequent heavy precipitation, heat waves, prolonged droughts, extreme flooding, higher sea levels, and other weather events. Miscellaneous/Other projects can also address projects that could benefit from sustainable development practices focusing on ecosystem-based and hybrid approaches to disaster risk reduction. It is important for Applicants and sub-applicants to provide thorough descriptions of project activities because of the unique nature of this eligibility category.

Flood Management General Certification Requirements per Hazard Mitigation Activity/Project

The table below presents the types of hazard mitigation activities/mitigation projects that are covered under this Flood Management General Certification with their associated design requirements.

Activity/Mitigation Project	Design Requirements
1. Property Acquisition and Structure Demolition	• The demolition of structures shall be comprised of removing the structure to existing grade. • Proper erosion and sedimentation controls will be utilized in conjunction with Best Management Practices as outlined in the Connecticut Guidelines for Soil Erosion and Sediment Control, as may be amended. • All temporary and permanent fill shall be clean and free of stumps, rubbish, hazardous and toxic material. • Equipment or material may be stored below the elevation of the base flood for a critical activity provided that such material or equipment is not subject to major damage by floods, and provided that such material or equipment is firmly anchored, restrained or enclosed to prevent it from floating away.
2. Property Acquisition and Structure Relocation	• Proper erosion and sedimentation controls will be utilized in conjunction with Best Management Practices as outlined in the Connecticut Guidelines for Soil Erosion and Sediment Control, as may be amended. • All temporary and permanent fill shall be clean and free of stumps, rubbish, hazardous and toxic material. • Equipment or material may be stored below the elevation of the base flood for a critical activity provided that such material or equipment is not subject to major damage by floods, and provided that such material or equipment is firmly anchored, restrained or enclosed to prevent it from floating away.
3. Structure Elevation	• Structures shall not be designed for human habitation unless elevated with the lowest floor one foot above the level of the base flood (base flood for a critical activity is the 500-year flood event – see definitions for "flood proofing" and "critical activity"). • Structures located within a "coastal high hazard area" as defined in 44 CFR Part 59, including structures in the Coastal AE zones but within the Limit of Moderate Wave Action (LiMWA) Line as identified by the existing best available flood hazard data shall be elevated on adequately anchored pilings or columns and securely anchored to such piles or columns such that the lowest portion of the structural members of the lowest floor (excluding the pilings or columns) is elevated to two (2) feet above the base flood and certified by a

	registered professional engineer or architect that the structure is securely anchored to piling or columns in order to withstand velocity waters and hurricane wave wash. • Proper erosion and sedimentation controls will be utilized in conjunction with Best Management Practices as outlined in the Connecticut Guidelines for Soil Erosion and Sediment Control, as may be amended.
4. Mitigation Reconstruction	• Structures shall not be designed for human habitation unless elevated with the lowest floor one foot above the level of the base flood (base flood for a critical activity is the 500-year flood event – see definitions for "critical activity"). • Structures located within a "coastal high hazard area" as defined in 44 CFR Part 59, including structures in the Coastal AE zones but within the Limit of Moderate Wave Action (LiMWA) Line as identified by the existing best available flood hazard data shall be elevated on adequately anchored pilings or columns and securely anchored to such piles or columns such that the lowest portion of the structural members of the lowest floor (excluding the pilings or columns) is elevated to two (2) feet above the base flood and certified by a registered professional engineer or architect that the structure is securely anchored to piling or columns in order to withstand velocity waters and hurricane wave wash. • Proper erosion and sedimentation controls will be utilized in conjunction with Best Management Practices as outlined in the Connecticut Guidelines for Soil Erosion and Sediment Control, as may be amended.
5. Generators	• Equipment which provides back up power generation, in the event of a power loss, to a critical facility. Note that per federal Hazard Mitigation Assistance regulations, as the installation of a generator is only eligible if it providing back up power to a critical facility, this excludes residential structures. • All generators must be elevated to the 500 year BFE.
6. Localized Flood Risk Reduction Projects	• No activity will have an increase in flood heights from existing to proposed conditions. • Proper erosion and sedimentation controls will be utilized in conjunction with Best Management Practices as outlined in the Connecticut Guidelines for Soil Erosion and Sediment Control, as may be amended. • All temporary structures, cofferdams, and fill shall not impede the movement of flood flows and shall be removed at the completion of their use. The design of such temporary structure, cofferdams and fill shall be based on the DOT Drainage Manual, as may be amended, where applicable. • All temporary and permanent fill shall be clean and free of stumps, rubbish, hazardous and toxic material. • Equipment or material may be stored below the elevation of the base flood for a critical activity provided that such material or equipment is not subject to major damage by floods, and provided that such material or equipment is firmly anchored, restrained or enclosed to prevent it from floating away. • No activity will have an increase in peak flow leaving the project site.

7. Non-localized Flood Risk Reduction Projects	• No activity will have an increase in flood heights from existing to proposed conditions • Proper erosion and sedimentation controls will be utilized in conjunction with Best Management Practices as outlined in the Connecticut Guidelines for Soil Erosion and Sediment Control, as may be amended. • All temporary structures, cofferdams, and fill shall not impede the movement of flood flows and shall be removed at the completion of their use. The design of such temporary structure, cofferdams and fill shall be based on the DOT Drainage Manual, as may be amended, where applicable. • All temporary and permanent fill shall be clean and free of stumps, rubbish, hazardous and toxic material. • Equipment or material may be stored below the elevation of the base flood for a critical activity provided that such material or equipment is not subject to major damage by floods, and provided that such material or equipment is firmly anchored, restrained or enclosed to prevent it from floating away. • No activity will have an increase in peak flow leaving the project site.
8. Infrastructure Retrofit	• No activity will have an increase in flood heights from existing to proposed conditions • Proper erosion and sedimentation controls will be utilized in conjunction with Best Management Practices as outlined in the Connecticut Guidelines for Soil Erosion and Sediment Control, as may be amended. • All temporary structures, cofferdams, and fill shall not impede the movement of flood flows and shall be removed at the completion of their use. The design of such temporary structure, cofferdams and fill shall be based on the DOT Drainage Manual, as may be amended, where applicable. • All temporary and permanent fill shall be clean and free of stumps, rubbish, hazardous and toxic material. • Equipment or material may be stored below the elevation of the base flood for a critical activity provided that such material or equipment is not subject to major damage by floods, and provided that such material or equipment is firmly anchored, restrained or enclosed to prevent it from floating away. • No activity will have an increase in peak flow leaving the project site.
9. Soil Stabilization	• No activity will have an increase in flood heights from existing to proposed conditions. • Proper erosion and sedimentation controls will be utilized in conjunction with Best Management Practices as outlined in the Connecticut Guidelines for Soil Erosion and Sediment Control, as may be amended. • All temporary structures, cofferdams, and fill shall not impede the movement of flood flows and shall be removed at the completion of their use. The design of such temporary structure, cofferdams and fill shall be based on the DOT Drainage Manual, as may be amended, where applicable. • All temporary and permanent fill shall be clean and free of stumps, rubbish, hazardous and toxic material. • Equipment or material may be stored below the elevation of the base flood for a critical activity provided that such material or equipment is not subject to major

	damage by floods, and provided that such material or equipment is firmly anchored, restrained or enclosed to prevent it from floating away. • No activity will have an increase in peak flow leaving the project site.
10. Community and Capacity Building Activities	• C&CB activities must result in a resource, strategy, or tangible mitigation product that will reduce or eliminate risk and damage from future natural hazards, increase resiliency, and promote a culture of preparedness.
11. Miscellaneous/Other	• To be determined based on proposed project.

Additional Flood Management General Certification Requirements

In addition, the sub-applicant/sub-grantee shall evaluate their proposed activity should it fall within those areas as identified below and obtain the appropriate permit(s) and/or documentation for the proposed activity. The sub-applicant/sub-grantee shall retain copies of the permit(s) and/or documentation and shall make them available to the State (DESPP/DEMHS) upon sub-grant close-out and/or upon request by the State (DESPP/DEMHS and/or DEEP).

- Coastal Boundary: If the proposed activity is located within the coastal boundary as delineated on DEEP approved coastal boundary maps, then the proposed activity must be consistent with the State's Coastal Area Management regulations. Any activity located at or below the Coastal Jurisdiction Line (CJL) or **within** tidal wetlands requires prior approval from DEEP Land & Water Resourced Division.

- Endangered or Threatened Species: If the proposed activity is located within an area identified as a habitat for endangered, threatened or special concern species on the "State and Federal Listed Species and Natural Communities Map", then the sub-applicant/sub-grantee must complete and submit to DEEP a Connecticut Natural Diversity Data Base (CT NDDB) Review Request Form (DEP-APP-007) to the address specified on the Form. The proposed activity must be consistent with the State and Federal Regulations regarding habitat for endangered, threatened, or special concern species. For more information visit the DEEP website at: www.ct.gov/dep/endangeredspecies (Review/Data Requests or call the NDDB at 860-424-3011).

- Aquifer Protection Areas: If the proposed activity is located within a town required to establish Aquifer Protection Areas, as defined in Section 22a-354a through 354bb of the Connecticut General Statutes (CGS) and the site is within an area identified as a Level A or Level B map, then the proposed activity must be consistent with the CGS Statutes and Regulations governing Aquifer Protection Areas.

- Conservation or Preservation Restriction: If the property is subject to a conservation or a preservation restriction, then the sub-applicant/sub-grantee must be in compliance with the terms of the restriction.

Some Projects may require an Individual Permit

While it is anticipated that most of the activities will be covered by this Flood Management General Certification, there are some activities that will require an Individual Permit. DEEP has determined that Individual Permits will be required for the following types of activities that are eligible under the category of "Non-localized Flood Risk Reduction Projects": construction, demolition, or rehabilitation of dams; construction or modification of dikes, levees, or floodways; and large scale channelization of a waterway.

Proposed activities/projects under the categories – "Localized Flood Risk Reduction Projects"; "Non-Localized Flood Risk Projects"; "Infrastructure Retrofit"; and "Miscellaneous/other" - can be designed in a manner whereby

the activity could still be covered under this Flood Management General Certification. To be in compliance with this Flood Management General Certification, the proposed activity/project would have to be designed in such a manner so as to demonstrate the following (where applicable):

- Balance cuts and fills within the 100-year floodplain.
- Must not increase peak flows from current to proposed conditions.
- Does not alter the hydraulic section of the floodplain such that there is an increase in water surface elevations from existing to proposed conditions.

If the design of the proposed activity/project cannot meet these requirements, then an Individual Permit would be required. DEEP will use reasonable efforts to review these Individual Permit applications within ten business days in order to maximize funding opportunities under the HMA grant program, with the understanding that other statutory notice requirements may also apply. Because of the time sensitive nature of the HMA programs, DEEP may provide an initial screening rather than a full review. To the extent possible, DEEP, DEMHS and potential applicants will work together in advance of any grant application to discuss potential projects in order to pre-identify relevant issues.

If there is a question as to whether a proposed activity/project falls under this Flood Management General Certification or under an Individual Permit, the sub-applicant must contact the DEEP's Land & Water Resources Division for guidance.

- If DEEP indicates that an Individual Permit will be required, the sub-applicant shall prepare all necessary documents as required and complete the DEEP LWRD Permit Application Form P (DEEP-LWRD-APP-00I). In addition, DESPP/DEMHS shall require the applicant to complete Compliance Forms A (Chief Executive Office Compliance Certification) and B (Professional Certification).
  - ***PROCESS NOTE:*** DESPP/DEMHS is responsible for completing Part VI (Application Certification) of the DEEP Transmittal Form and Part XII (Certification Statement) of application Form P.
- The sub- applicant shall submit the Permit Application Form and Compliance Forms A and B to DESPP/DEMHS. DESPP/DEMHS will complete Part VI of the DEEP Transmittal Form and Part XII of the Application Form and will submit the Permit Application to DEEP for their consideration and action. Should DEEP grant the License, the originator of the DEEP Form (e.g., the Chief Executive Officer of the municipality; the Chief Executive Officer of a qualified private non-profit organization; or the Chief Executive Officer of a federally recognized Native American Tribe) is responsible for the contents and accuracy of the Individual Certification.

DEEP's Permit Application website: https://portal.ct.gov/DEEP/Permits-and-Licenses/Land-and-Water-Resource-Division-LWRD-Applications#floodmgmt

Required Application Documents

The following process is in effect for this Flood Management General Certification:

1. A copy of the General Certification will be made available on the DESPP/DEMHS website and applicants will be made aware of the requirements.

2. As part of the Hazard Mitigation Assistance submittal application, the Chief Executive Officer of a municipality, qualified private non-profit organization, or of a federally recognized Native American Tribe, in which the proposed activity is taking place, shall certify that the proposed activity has been designed in accordance with the design requirements of this general certification. The Chief Executive Officer shall prepare and sign Compliance Form A which is entitled "Chief Executive Officer Compliance Certification" form. (See attached form)
3. If the proposed activity requires an engineering design, then the Professional Engineer preparing the plans on behalf of the Chief Executive Officer or the homeowner shall prepare and sign Compliance Form B which is entitled "Professional Certification." Those preparing the design plans shall affix their Professional Engineer Connecticut license number and stamp to the form. (See attached form)
4. Upon filing of the application to FEMA, DESPP/DEMHS shall provide copies of Compliance Forms A and B to the DEEP Director of the Land & Water Resources Division, located at 79 Elm Street, Hartford, CT.

State of Connecticut
Department of Emergency Services and Public Protection
Division of Emergency Management and Homeland Security

Flood Management General Certification for Certain Program Activities
Under the FEMA Hazard Mitigation Assistance Grant Programs

Compliance Form A: Chief Executive Officer Compliance Certification. The term Chief Executive Officer includes the following: a municipality; a qualified private non-profit organization; or a federally recognized Native American Tribe.

Name of Applicant:
Town of Stratford

Proposed flood protection system improvements for the Town of Stratford's Water Pollution Control Facility consisting of additional earthen embankment, new flood wall segments, and flood gates at roadway crossings.

The recipient of federal funding will be:

Name: Town of Stratford

Mailing Address: 2725 Main Street

City/Town: Stratford State: CT Zip Code: 06615

Phone: 203-385-4013 ext. Fax:

Based on my review and reasonable investigation, including my inquiry of those individuals responsible for preparing the information, the proposed activity described in this application is consistent with all applicable standards and criteria established or referred to in this Flood Management General Certification. Proposed activities identified under this Flood Management General Certification are to be designed in compliance with the flood management requirements of CGS Section 25-68d(b) and Sections 25-68h-1 and 25-68h-3 of the Regulations of Connecticut State Agencies (RCSA).

I understand that a false statement made in the submitted information may, pursuant to Section 22a-6 of the General Statutes, be punishable as a criminal offense under Section 53a-157b of the General Statutes, and may also be punishable under Section 22a-438 of the General Statutes.

Laura R. Hoydick — 9/3/2024

Chief Executive Officer Signature — Date

Laura R. Hoydick

Chief Executive Officer
(Print or Type)

State of Connecticut
Department of Emergency Services and Public Protection
Division of Emergency Management and Homeland Security

Flood Management General Certification for Certain Program Activities
Under the FEMA Hazard Mitigation Assistance Grant Programs

Compliance Form B: Professional Certification

Name of Applicant:

Town of Stratford

Description of Proposed Project:

Proposed flood protection improvements for Town of Stratford's Water Pollution Control Facility

The recipient of federal funding will be:

Name: Town of Stratford

Mailing Address: 275 Main Street

City/Town: Stratford State: CT Zip Code: 06615

Phone: 203-385-4013 ext. Fax:

Plan Dated and Revised Through: August 2024

I hereby certify that the prepared information and the proposed activity described in this application is consistent with all applicable standards and criteria established or referred to in this Flood Management General Certification. Proposed activities identified under this Flood Management General Certification are to be designed in compliance with the flood management requirements of CGS Section 25-68d(b) and Sections 25-68h-1 and 25-68h-3 of the Regulations of Connecticut State Agencies (RCSA).

I understand that a false statement made in the submitted information may, pursuant to Section 22a-6 of the General Statutes, be punishable as a criminal offense under Section 53a-157b of the General Statutes, and may also be punishable under Section 22a-438 of the General Statutes.

Signature of Professional Engineer

Date

August 23, 2024

Name of Professional Engineer (Print or Type)

David M. Barstow, P.E.

P.E. Number

23183

Affix P.E. Stamp Here

FEDERAL EMERGENCY MANAGEMENT AGENCY

RECORD OF ENVIRONMENTAL CONSIDERATION (REC)

Project PDMC-PJ-01-CT-2017-006 (0)

Title: in Stratford-PDM2017

NEPA DETERMINATION

Non Compliant Flag: No
EA Draft Date:
EA Final Date:
EA Public Notice Date:
EA Fonsi
Level: CATEX
EIS Notice of Intent
EIS ROD Date:

Comment Project Description: The Town of Stratford, Connecticut, applied for flood risk reduction measures to protect the town Water Pollution Control Facility (WPCF). The site is partially protected from coastal flooding by existing flood protection dikes and levees (crest elevations +/- 10 to 12 feet North American Vertical Datum of 1988 [NAVD 88]) that surround about 90% of the perimeter of the facility.

The proposed project primarily includes the installation of a flood wall around the perimeter of the plant on top of the existing levees and dikes to elevate the level of protection to 16 feet NAVD 88. This includes the installation of five flood gates that would be manually installed during flood events and stored on site. The subrecipient also plans on modifying the plant stormwater inlets and outfalls to prevent backflow during flood events.

NEPA: This project has been determined to be Categorically Excluded from the need to prepare either an Environmental Impact Statement or Environmental Assessment in accordance with FEMA Instruction 108-1-1 and DHS Instruction 023-01-001-01. Particular attention should be given to the project conditions before and during project implementation. Failure to comply with these conditions may jeopardize federal assistance including funding. - lbarlow1 - 03/20/2020 16:30:21 GMT

CATEX CATEGORIES

Catex Category Code	Description	Selected
*n9	(*n9) Federal Assistance for Flood Hazard Reduction Actions. Federal assistance for drainage, berm, water crossing, and detention, retention, or sediment pond projects which have the primary purpose of addressing flood hazards and: (a) Do not affect more than 25 acres, (b) Do not result in adverse flood risk effects to downstream communities, (c) Do not result in any increase of flood levels within the community during the occurrence of the base flood discharge if the action takes place within the regulatory floodway, and (d) Where the effect of the proposed project when combined with other existing or reasonably foreseeable development will not increase water surface elevation of the base flood more than one foot at any point within the community if the action takes place in a floodplain with no regulatory floodway. This CATEX covers minor flood control actions as identified in Sections 1366 and 1361 of the National Flood Insurance Act (NFIA). Actions that are not covered in Sections 1366 and 1361 of the NFIA, such as dikes, levees, seawalls, groins, and jetties, are excluded from this CATEX.	Yes

EXTRAORDINARY

Extraordinary Circumstance Code	Description	Selected ?
	No Extraordinary Circumstances were selected	

ENVIRONMENTAL LAW / EXECUTIVE ORDER

FEDERAL EMERGENCY MANAGEMENT AGENCY

RECORD OF ENVIRONMENTAL CONSIDERATION (REC)

Project PDMC-PJ-01-CT-2017-006 (0)

Title: in Stratford-PDM2017

Environmental Law/ Executive Order	Status	Description	Comment
Clean Air Act (CAA)	Completed	Project will not result in permanent air emissions - Review concluded	
Coastal Barrier Resources Act (CBRA)	Completed	Project is not on or connected to CBRA Unit or otherwise protected area - Review concluded	
Clean Water Act (CWA)	Completed	Project would affect waters, including wetlands, of the U.S.	CWA: This project as described may require permitting or coordination from the U.S. Army Corps of Engineers (USACE) or the CT DEEP. See condition. - lbarlow1 - 03/20/2020 16:52:24 GMT
	Completed	Project may require Section 404/401 or Section 9/10 (Rivers and Harbors Act) permit, including qualification under Nationwide Permits - Review concluded	
Coastal Zone Management Act (CZMA)	Completed	Project is located in a coastal zone area and/or affects the coastal zone	CZMA: See Condition. - lbarlow1 - 03/20/2020 16:52:51 GMT
	Completed	State administering agency requires consistency review - Review concluded	
Executive Order 11988 - Floodplains	Completed	Located in floodplain or effects on floodplain/flood levels	EO11988:The proposed action is a critical action as defined by 44 CFR Part 9: Critical Action means an action for which even a slight chance of flooding is too great. The minimum floodplain of concern for critical actions is the 500-year floodplain. Per Flood Insurance Rate Map (FIRM) community and panel number 09001C0442G dated 07/08/2013; the project is located within the Special Flood Hazard Areas (SFHA) (100-year floodplain). See Condition(s). - lbarlow1 - 03/20/2020 16:59:25 GMT
	Completed	Possible adverse effects associated with investment in floodplain, occupancy or modification of floodplain environment	
	Completed	8 Step Process Complete - documentation attached - Review concluded	
Executive Order 11990 - Wetlands	Completed	Located in wetlands or effects on wetlands	EO11990: Determination based on review of U.S. Fish and Wildlife National Wetlands Inventory, Wetlands Mapper at http://www.fws.gov/wetlands/Data/Mapper.html accessed on 10/01/2019. See attached 8-step in floodplain section. - lbarlow1 - 03/20/2020 17:01:19 GMT

FEDERAL EMERGENCY MANAGEMENT AGENCY

RECORD OF ENVIRONMENTAL CONSIDERATION (REC)

Project PDMC-PJ-01-CT-2017-006 (0)

Title: in Stratford-PDM2017

Environmental Law/ Executive Order	Status	Description	Comment
	Completed	Possible adverse effect associated with constructing in or near wetland	
	Completed	Review completed as part of floodplain review - Review concluded	
Executive Order 12898 - Environmental Justice for Low Income and Minority Populations	Completed	Low income or minority population in or near project area	
	Completed	No disproportionately high and adverse impact on low income or minority population - Review concluded	
Endangered Species Act (ESA)	Completed	Listed species and/or designated critical habitat present in areas affected directly or indirectly by the federal action	ESA: Determination based on 10/01/2019 review of USFWS site at: https://ecos.fws.gov/ipac/; this project as described will not affect ESA-listed Northern Long-eared Bat (Myotis septentrionalisor), Red Knot (Calidris canutus rufa), and Roseate Tern (Sterna dougallii dougallii) or critical habitat. - lbarlow1 - 03/20/2020 16:51:36 GMT
	Completed	No effect to species or designated critical habitat (See comments for justification) - Review concluded	
Farmland Protection Policy Act (FPPA)	Completed	Project does not affect designated prime or unique farmland - Review concluded	
Fish and Wildlife Coordination Act (FWCA)	Completed	Project does not affect, control, or modify a waterway/body of water - Review concluded	
Migratory Bird Treaty Act (MBTA)	Completed	Project located within a flyway zone	
	Completed	Project does not have potential to take migratory birds - Review concluded	
Magnuson-Stevens Fishery Conservation and Management Act (MSA)	Completed	Project not located in or near Essential Fish Habitat - Review concluded	
National Historic Preservation Act (NHPA)	Completed	Standard Section 106 review	NHPA: Under the terms of the Programmatic Agreement, a FEMA HP Specialist made a determination of "no historic properties affected" and sent this determination, along with supporting Section 106 documentation, to the State Historic Preservation Officer (SHPO) on

RECORD OF ENVIRONMENTAL CONSIDERATION (REC)

Project PDMC-PJ-01-CT-2017-006 (0)

Title: in Stratford-PDM2017

Environmental Law/ Executive Order	Status	Description	Comment
			01/29/2020. The SHPO concurred with FEMA's determination of effect on 02.04.2020. See attached consultation documentation. No further consultation is required at this time. - lbarlow1 - 03/20/2020 16:46:41 GMT
	Completed	Building or structure 50 years or older or listed on the National Register in the project area and activity not exempt from review	
	Completed	Determination of No Historic Properties Affected (FEMA finding/SHPO/THPO concurrence attached) - Review concluded	
	Completed	Project affects only previously disturbed ground - Review concluded	
Wild and Scenic Rivers Act (WSR)	Completed	Project is not along and does not affect Wild and Scenic River - Review concluded	

CONDITIONS

Special Conditions required on implementation of Projects:

EO 11988: The Applicant must coordinate with the local permitting official responsible for floodplain development to ensure the facility is protected to local floodplain standards for critical actions (minimum Federal Standard to be flood proofed to the 500-year flood elevation) and must obtain all required permission prior to initiating work. All coordination pertaining to these activities and applicant compliance with all project grant conditions shall be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files.

Source of condition: Executive Order 11988 - Floodplains Monitoring Required: No

EO11990: The Applicant is responsible for following this and all other requirements set forth in the General Section of the US Army Corps of Engineers' Programmatic General Permit. Adequate sedimentation and erosion control management measures, practices, and devices; such as phased construction, vegetated filter strips, geotextile silt fences, or other devices, shall be installed and properly maintained to reduce erosion and retain sediment on-site during and after construction.

Source of condition: Executive Order 11990 - Wetlands Monitoring Required: No

CWA: The Applicant is responsible for obtaining all required federal, state and local permits. Before, and no later than, submission of a project closeout package, the applicant shall provide FEMA with a copy of the required permit from the USACE and the CT DEEP, or documentation from those agencies that a permit is not required.

Source of condition: Clean Water Act (CWA) Monitoring Required: No

CZMA: The applicant is responsible for coordinating with and obtaining any required permit(s) and/or consistency determination from the CT DEEP prior to initiating work. Before, and no later than, submission of a project closeout package, all coordination pertaining to these activities, and applicant compliance with any conditions, shall be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files. Non-compliance with this condition may jeopardize federal funding.

RECORD OF ENVIRONMENTAL CONSIDERATION (REC)

Project PDMC-PJ-01-CT-2017-006 (0)

Title: in Stratford-PDM2017

CZMA: The applicant is responsible for coordinating with and obtaining any required permit(s) and/or consistency determination from the CT DEEP prior to initiating work. Before, and no later than, submission of a project closeout package, all coordination pertaining to these activities, and applicant compliance with any conditions, shall be documented and copies forwarded to the state and FEMA for inclusion in the permanent project files. Non-compliance with this condition may jeopardize federal funding.

Source of condition: Coastal Zone Management Act (CZMA) Monitoring Required: No

NHPA CONDITION #1 (artifacts): In the event of the discovery of archaeological deposits (e.g. Indian pottery, stone tools, shell, old house foundations, old bottles) the Subrecipient and their contractor shall immediately stop all work in the vicinity of the discovery and take reasonable measures to avoid or minimize harm to the finds. The Subrecipient and their contractor shall secure all archaeological discoveries and restrict access to discovery sites. The Subrecipient shall immediately report the archaeological discovery to the Recipient (Ken Dumais, State Hazard Mitigation Officer, CT DESPP, 860-685-8151) and the FEMA Deputy Regional Environmental Officer Mary Shanks, 617-901-2204; FEMA will determine the next steps.

Source of condition: National Historic Preservation Act (NHPA) Monitoring Required: No

CT NHPA CONDITION #2 (human remains): In the event of the discovery of human remains, the Subrecipient and their contractor shall immediately stop all work in the vicinity of the discovery and take reasonable measures to avoid or minimize harm to the finds. The Subrecipient and their contractor shall secure all human remains discoveries and restrict access to discovery sites. The Subrecipient and their contractor shall follow the provisions of applicable state laws, including Connecticut General Statute, Section 10-388 et seq. (Human burials), or any amendments or supplanting laws and regulations. Violation of state law will jeopardize FEMA funding for this project. The Subrecipient will inform the Office of the Chief Medical Examiner Dr. Gill James, 860-679-3980, the State Archaeologist Brian Jones, 860-486-5248, the Recipient [Ken Dumais, State Hazard Mitigation Officer, CT DESPP, 860-685-8151] and the FEMA Deputy Regional Environmental Officer Mary Shanks, 617-901-2204. FEMA will consult with the SHPO and Tribes, if remains are of tribal origin. Work in sensitive areas may not resume until consultation is completed and appropriate measures have been taken to ensure that the project is compliant with the National Historic Preservation Act.

Source of condition: National Historic Preservation Act (NHPA) Monitoring Required: No

NHPA (borrow sources): All borrow or fill material must come from pre-existing stockpiles, material reclaimed from maintained roadside ditches (provided the designed width or depth of the ditch is not increased), or commercially procured material from a source existing prior to the event. For any FEMA-funded project requiring the use of a non-commercial source or a commercial source that was not permitted to operate prior to the event (e.g. a new pit, agricultural fields, road ROWs, etc.) in whole or in part, regardless of cost, the Applicant must notify FEMA and the Recipient prior to extracting material. FEMA must review the source for compliance with all applicable federal environmental planning and historic preservation laws and executive orders prior to a subrecipient or their contractor commencing borrow extraction. Consultation and regulatory permitting may be required. Non-compliance with this requirement may jeopardize receipt of federal funding. Documentation of borrow sources utilized is required at closeout.

Source of condition: National Historic Preservation Act (NHPA) Monitoring Required: No

Standard Conditions:

Any change to the approved scope of work will require re-evaluation for compliance with NEPA and other Laws and Executive Orders.

This review does not address all federal, state and local requirements. Acceptance of federal funding requires recipient to comply with all federal, state and local laws. Failure to obtain all appropriate federal, state and local environmental permits and clearances may jeopardize federal funding.

If ground disturbing activities occur during construction, applicant will monitor ground disturbance and if any potential archeological resources are discovered, will immediately cease construction in that area and notify the State and FEMA.

TECHNICAL SPECIFICATION ATTACHMENT – A2

- "Geotechnical Engineering and Environmental Data Report, Stratford Water Pollution Control Facility, 105 Beacon Point Road, Stratford, Connecticut", dated February 20, 2023, prepared by GZA GeoEnvironmental, Inc.
- "Supplemental Analytical Data Report, Stratford Water Pollution Control Facility (WPCF) Perimeter Flood Wall Improvements, Stratford, Connecticut 06115", dated January 29, 2026, prepared by GZA GeoEnvironmental, Inc.

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Geotechnical Engineering and Environmental Data Report

STRATFORD WATER POLLUTION CONTROL FACILTY PERIMETER FLOOD WALL IMPROVEMENTS

105 Beacon Point Road
STRATFORD, CONNECTICUT

February 20, 2023
File No. 18.0172256.70

PREPARED FOR:
Town of Stratford
2725 Main Street
Stratford, Connecticut

GZA GeoEnvironmental, Inc.
95 Glastonbury Boulevard, Third Floor | Glastonbury, CT 06033
860-286-8900

32 Offices Nationwide
www.gza.com

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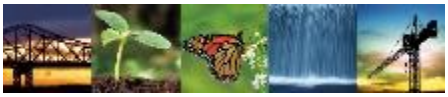

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February 20, 2023
File No. 18.0172256.70

John Casey, P.E.
Engineering Department
Town of Stratford
Stratford, Connecticut 06615

Re: Geotechnical Engineering and Environmental Data Report
Stratford Water Pollution Control Facility
Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

Dear Mr. Casey:

This geotechnical engineering and environmental data report was prepared by GZA GeoEnvironmental, Inc. (GZA) in accordance with our December 6, 2021 agreement with the Town of Stratford (Client). This report presents the results and data from our geotechnical exploration and laboratory program for the Stratford Water Pollution Control Facility (WPCF). The Stratford WPCF (Site) is located at 105 Beacon Point Road in Stratford, Connecticut. The report is subject to the Limitations attached in **Appendix A**.

We appreciate the opportunity to work with you on this project. Please contact Chris Eggers, P.E. (203-910-9170) or David Barstow, P.E. (860-250-2131) if you have any questions or require additional information.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Christopher G. Eggers, P.E.
Sr. Project Manager

Samuel Bell
Sr. Project Manager

Daniel C. Stapleton, P.E.
Senior Principal

David M. Barstow, P.E.
Engineer of Record

An Equal Opportunity Employer M/F/V/H

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1.0 PROJECT BACKGROUND

This geotechnical engineering and environmental data report presents the results of GZA GeoEnvironmental, Inc.'s (GZA's) subsurface explorations and laboratory testing for the proposed Stratford Water Pollution Control Facility (WPCF) Perimeter Flood Wall Improvements project. The WPCF is located at 105 Beacon Point Road in Stratford, Connecticut on the west side of the Housatonic River. **Figure 1** presents the site location. The report is subject to the Limitations presented in **Appendix A**. Elevations in this report reference the North American Vertical Datum of 1988 (NAVD88) unless stated otherwise. Previous borings by others reference Mean Sea Level, National Geodetic Vertical Datum of 1929 (NGVD29), and the Stratford local datum of 100-feet + Mean Sea Level. The elevations on the previous test borings by others can be converted to NAVD88 using the following conversions:

Mean Sea level (1970s) to NAVD88 = -0.40 feet
National Geodetic Vertical Datum of 1929 (NGVD29) to NAVD88 = -1.1 foot
Stratford local datum of 100-feet + Mean Sea Level to NAVD88 = -100.4 feet

GZA prepared the 2016 Stratford Coastal Community Resilience Plan (CCRP) for the Town of Stratford and identified the WPCF as a flood-vulnerable, critical Lifeline Facility. The WPCF and six of the sanitary pump stations were identified to be vulnerable to coastal flooding. As such, the Town was successful in applying for and receiving a FEMA PDMC grant award resulting in Project No. PDMC-PJ-01-CT-2017-006. We understand the Town intends to implement the flood protection project. As such, GZA prepared a 30% design drawing set entitled “Water Pollution Control Facility Flood Protection System Enhancements, Stratford, Connecticut, Conceptual Design", May 2020, which provides the existing conditions discussed below. The proposed improvements shown in the 30% design submittal are in design evolution. The general layout of the protection system is the same at current design progress point. However, the system design development includes some updates to the specifics of the layout and construction type of walls partly in response to the information gained during this geotechnical investigation.

1.1 EXISTING SITE CONDITIONS

The Site is located on the west shore of the Housatonic River and is shown on **Figure 1 – Site Locus**. The Project area is the perimeter of the WPCF as shown on **Figure 2-Exploration Location Plan**.

The Site is developed with service roads, sidewalks, lawns, and the WPCF plant structures including: Anoxic tanks, Aeration Tanks, Blower Building and Return Pumping Station, Secondary Settling Tanks/Clarifiers and Associated Distribution Box, Pumping Station and Wet Well, UV Disinfection Channel, Control Building, Primary Tanks, Soda Ash Feed System, Biofilter and Sludge Holding Tanks, Sludge Thickening Tank and Building, Diversion Chambers A, B and C, Two Electrical Substations, Emergency Generator and Load Bank, Vehicle Storage Building, Sludge Dewatering and Incinerator Building and Maintenance Building, Raw Sewage Pumping Station and Inlet Works Building (Headworks), Bypass Valve Chamber, and Methanol Activities.

The existing site grades are at about El. 7 to 10 feet NAVD88 within the WPCF. The WPCF is currently protected by existing flood protection dikes and levees with crest elevations of approximately El. 10 to 13 feet NAVD88. This flood protection system includes the Birdseye Street Extension.

1.2 PROPOSED CONSTRUCTION

The proposed improvements include raising the existing flood protection to El. +16 feet surrounding the WPCF as shown on **Figure 2**. These perimeter improvements are subdivided into four segments, generally correlating to each side of the WPCF perimeter, and are the:

- Beacon Point Road Dike: Located north of Beacon Point Road (south side of WPCF) and will be about 864-feet long per 30% design plans and 846-feet long in current progress design development;
- North Road Dike: Located on the west side of the WPCF and will be about 1,084-feet long 30% design plans and 1,143-feet long in current progress design development;
- Birdseye Street Flood Dike: Located north side of the WPCF along Birdseye Street and will be about 454-feet long at 30% design plans and 570-feet long in current progress design development; and
- Beacon Point Road Levee: Located along the west side of the WPCF and will be about 646-feet at long 30% design plans and 586-feet long in current progress design development.

Beacon Point Road Dike – The Beacon Point Road Dike currently consists of an existing dike composed of an earthen berm with stone armor on the exterior side of the WPCF. The toe of the dike is at about EL. +10 feet NAVD88 on both sides of the dike. The top of the existing dike varies from about El. +12 feet NAVD88 to El. +15 feet NAVD88. The proposed work includes improved and raised earthen dike to top of dike at El. +17 feet NAVD88. The proposed top of dike will be up to about 5-feet above the top of existing dike crest.

North Road Dike – The North Road Dike currently consists of an existing dike composed of an earthen berm with armor stone on the exterior side of the WPCF. The toe of the dike is at about EL. +2 feet NAVD88 on the water side (exterior of the WPCF) and about El. +10 feet NAVD88 on the interior of the WPCF. The top of dike is at about EL. +11 feet NAVD88. The proposed work is similar to the Beacon Point Road Dike and includes approximately 453-feet of earthen dike on the south of the segment that will transition to approximately 690-feet of pile supported wall. The top of protection for the earthen dike and wall will be at El. +17 feet NAVD88.

Birdseye Street Flood Dike – The Birdseye Street Flood Dike currently consists of an earthen berm dike. The dike embankment includes Birdseye Street along the crest, which is about 32-feet wide. Stone armor is present along the waterside of the dike (exterior to the WPCF). The top of dike elevations vary from about EL. +5 feet NAVD88 near the northeast entrance gate to the WPCF to about El. +10 feet NAVD88. The toe of the embankment outside of the WPCF is at about El. +5 to +7 feet NAVD88. The landside, interior to the WPCF, toe of the embankment varies from about EL. +7 to +10 feet NAVD88. The proposed work includes a new dike and wall to El. +17 feet NAVD 88. This proposed dike will be located south of the existing dike, within the WPCF. A flood gate will connect the new North Road Dike and the existing Birdseye Street Dike. The earthen dike is proposed in the interior third of the segment with pile supported walls along the adjoining ends of the segment. A flood gate will be constructed to accommodate the northeast entrance gate access to the WPCF. The proposed dike will require about 6 to 10 feet of fill to raise existing site grades.

Beacon Point Road Levee – The existing Beacon Point Road Levee is similar to the Birdseye Street Flood Dike. The levee consists of an earthen berm embankment with stone armor on the waterside. Beacon Point Road is constructed along the crest of the embankment. An outfall from the WPCF to the Housatonic River penetrates the levee. The top of levee is at about EL. +10 to +11 feet NAVD88. The proposed work includes wall installation along the top of the existing revetment with a top of wall at El. +17 feet NAVD88.

In locations where sheet piles cannot be installed due to site constraints or subsurface obstruction, a concrete T-wall can be used as an alternate to steel sheet pile wall installation.

2.0 GEOTECHNICAL INVESTIGATION

2.1 SUBSURFACE EXPLORATION PROGRAM

Six test borings (GZ-1(OW), GZ-2, GZ-2A, GZ-3, GZ-4(OW), and GZ-5) and one test probe (TP-3 Probe) were drilled by SoilTesting, Inc. of Oxford, Connecticut between April 4 and April 14, 2022. The test borings were drilled to depths between 32- and 63.5-feet below grade with a truck-mounted Diedrich D120 drill rig using hollow-stem augers or cased-wash drilling techniques as noted on the boring logs. Borings with 'OW' indicate that a temporary observation well was installed. GZ-2A was drilled to evaluate the presence of former underground tank debris between GZ-2 and GZ-3 which are identified on **Figure 3**. TP-3 PROBE was drilled to evaluate the depth to bedrock near GZ-5.

Soil samples were collected continuously through existing Fill in GZ-1(OW), GZ-2, GZ-2A, GZ-3, GZ-4(OW), and GZ-5 and at 5-foot intervals, thereafter, in general accordance with ASTM D1586, the Standard Penetration Test (SPT). GZ-4 (OW) was drilled as a probe without sampling from 42 to 63.5 feet below grade to evaluate the depth to bedrock.

The SPT soil samples were collected with a 1-3/8-inch I.D. split-spoon sampler driven (normally) 24 inches with a 140-lb safety hammer lifted by cathead and rope falling 30 inches. The SPT values, referred to as the "N" value, is the number of blows required to drive the sampler from 6 to 18 inches of penetration. In addition to split-spoon samples, 2 undisturbed tube samples of organics were collected from GZ-1 (OW). A 5-foot-long bedrock core was collected at test boring GZ-5 to confirm the presence of bedrock and to assess the type and quality of bedrock at the site. See **Appendix D** for photographs of the rock core.

Groundwater measurements were recorded at the times indicated on the test boring logs and are summarized in **Table 1.** Two temporary observation wells were installed at GZ-1(OW) and GZ-4 (OW). The observation wells were removed and backfilled on April 14, 2022.

Six test pits, (TP-1 to TP-6) were made by Conte Company, LLC of Norwalk, CT with a Caterpillar 304 excavator. The test pits were excavated up to six feet below grade in the existing levee and dike materials. TP-3 PROBE was drilled after TP-3 was excavated and a single split spoon sample was conducted after roller bit refusal. Test pit logs and photographs are provided in **Appendix C.**

The test pits and test borings were logged by GZA field personnel. The soils were classified according to the modified Burmister classification system. Field torvane (TV) and pocket penetrometer (PP) measurements were performed on organic soil samples in the field and are provided on the test boring logs. GZA personnel screened the soil samples for organic vapors using a photoionization detector (PID) and the results are provided on the test boring logs. The test boring logs are attached as **Appendix B**. The exploration locations were approximated by GZA personnel using line of site and tape measurements from existing site features. Ground surface elevations were interpolated by GZA from plans "Water Pollution Control Facility Flood Protection System Enhancements, Stratford, Connecticut, Conceptual Design", prepared by GZA, May 2020. The approximate exploration locations are presented on the attached **Figure 2**.

A composite soil sample was collected from GZ-2 for analytical testing. Laboratory test results and recommendations are included in **Section 3** below.

2.2 PREVIOUS EXPLORATIONS BY OTHERS

GZA was provided previous subsurface explorations performed at the Site, which were completed by CDM, General Borings, Inc., American Drilling & Boring Company, Inc., and CE Maguire, Inc. (or C.E. Maguire & Associates[1]). The boring logs were included in the report titled "Town of Stratford, Water Pollution Control Facility Upgrade, Stratford, Connecticut, Geotechnical Design Report" dated August 12, 2005, and prepared by CDM. The previous borings were performed in 1967, 1969, 1972, 1980, and 2004. Forty-nine (49) of the previous borings were located along the area of interest for the current project. Additional borings are available within the WPCF but are beyond the area of interests and limits of the proposed work. The relevant previous exploration locations are presented on **Figure 2** and the boring logs are included in **Appendix E**.

3.0 LABORATORY ANALYSIS

Laboratory analysis was performed on collected samples for assignment of geotechnical and environmental parameters.

3.1 GEOTECHNICAL

Select soil samples collected from the test borings were submitted to GeoTesting Express of Acton, Massachusetts for the following laboratory tests:

- 7 Moisture Content
- 6 Atterberg Limits
- 7 Gradation Analyses (sieves or sieves and hydrometers)
- 2 Unconsolidated Undrained Compressive Strength Tests
- 2 One Dimensional Consolidation Tests

The purpose of the testing was to confirm engineering classifications of the site soils and to aid designers and contractors in evaluating the suitability of on-site soils for potential reuse. Laboratory test results are presented in **Appendix F** and summarized in the table below.

[1] Some boring logs also refer to C.A. Maguire & Associates

Boring ID	Sample ID	Depth	Moisture Content (%)	Atterberg Limits Liquid Limit (%)	Atterberg Limits Plastic Limit (%)	% Passing No. 200	Laboratory Sample Description
GZ-1 (OW)	SS-7	15-17	74.1	NP	NP	---	Dark greyish brown Silt
	ST-1	17-19	182.3	134.0	78.0	---	Dark grey Silt
	ST-2	21-23	429.5	366.0	231.0	---	Dark brown Silt
	SS-9	23-25	361.8	486.0	310.0	---	Black Silt
	SS-10	25-27	432.5	---	---	---	Fibrous Peat
GZ-2	SS-2	2-4	---	---	---	27.5	Fine to medium sand, some silt, trace gravel
	SS-5	8-10	---	---	---	22.8	Fine to medium sand, some silt, trace gravel
GZ-3	SS-5	10-11.6	134.5	163.0	70.0	---	Black Silt
GZ-4	SS-7	14-16	47.0	NP	NP	---	Black Silt
GZ-5	SS-5	10-12	---	---	---	3.1	Fine to coarse sand and gravel, trace silt
GZ-14	SS-5	10-12	---	---	---	5.7	Fine to coarse sand and gravel, little silt
	SS-9	25-27	---	---	---	37.6	Fine to medium sand and silt
TP-3	S-2	2-4.5	---	---	---	14.8	Fine to medium sand, some gravel, little silt
TP-6	S-2	2	---	---	---	8.2	fine to medium sand, trace silt

NP = non-plastic
--- = test not performed

Six grain size (sieve) analyses were also performed in 2004 by CDM and are attached in **Appendix E**.

3.2 ENVIRONMENTAL

Soils collected from the borings were evaluated for visual and olfactory evidence of contamination and screened using a photo-ionization detector (PID) with a 10.6 eV lamp. A PID is a screening instrument that is capable of detecting certain organic vapors which are constituents of petroleum fuels and oils. A PID is used as a screening instrument only and does not provide absolute values for concentrations in soil samples. The PID was calibrated to 100 parts per million (ppm) isobutylene standard prior to sample screening. A background reading of 0.0 ppm on the PID was noted during the sampling.

No petroleum odors or staining were noted from the soil samples. No elevated PID readings (>0.6 ppm) were measured from soils throughout the GZA borings. GZA collected a composite soil sample from the split spoons in the 0- to 8-foot depth interval for laboratory analysis at boring GZ-2.

3.2.1 ANALYTICAL RESULTS

Soil sample GZ-2 (0-8) was submitted to Complete Environmental Testing, Inc. of Stratford, Connecticut, a CT-certified laboratory for the following analyses:

- Total RCRA 8 Metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver);
- CT Extractable Total Petroleum Hydrocarbons (CT ETPH), by CT DPH method;
- Volatile Organic Compounds (VOCs), by EPA Method 8260/5035;
- Polyaromatic Hydrocarbons (PAHs) by EPA Method 8270C;
- Polychlorinated Biphenyls (PCBs), by EPA Method 8082A; and
- Pesticides by EPA Method 8081.

Analytical results were compared to the following criteria in the Connecticut Remediation Standard Regulations (CT RSRs):

- Residential Direct Exposure Criteria (R-DEC)
- Industrial/Commercial Direct Exposure Criteria (I/C-DEC)
- Class GA Pollutant Mobility Criteria (GA-PMC)
- Class GB Pollutant Mobility Criteria (GB-PMC)

The analytical results are summarized and tabulated in **Appendix G.** The results indicate that ETPH, VOCs and PAHs were not detected above laboratory minimum reporting limits (MRLs). Several metals were detected in the soil sample but at concentrations generally consistent with a naturally occurring source, except for lead which was slightly elevated but below RSR criteria.

PCBs were detected at a concentration exceeding the R-DEC.

3.2.2 ANALYTICAL CONCLUSIONS

Based on our field observations and the analytical results, soils from the 0- to 8-foot depth interval from boring GZ-2 contain a concentration of PCBs above the R-DEC. GZA recommends developing a Soil Management Plan (SMP) to provide a program for handling, segregating, stockpiling, sampling, and reusing or disposing of soil/material which may be encountered during planned excavation and construction activities.

Evaluation of soil quality was limited to the locations described. Additional investigation would be required to assess the extent and degree of the detected impacts and develop sufficient information to facilitate selection of a suitable offsite soil reuse/disposal facility.

4.0 SUBSURFACE CONDITIONS

Based on the results of our subsurface exploration program (6 test borings, one probe, and 6 test pits) and the previous explorations by others (49 test borings), the subsurface conditions at the site generally consist of the following, in order of increasing depth: Topsoil or Asphalt (included as Fill strata), Fill, Organics, Outwash Deposits, Glacial Till, and Bedrock. The perimeter improvements have been subdivided into four segments (Beacon Point Road Dike, North Road Dike, Birdseye Street Flood Dike, and Beacon Point Road Levee). The subsurface conditions are described for each segment of work below and a summary of subsurface conditions and stations along the segment are provided in **Table 2A** through **Table 2D**.

4.1 BEACON POINT ROAD DIKE

Within the area of the Beacon Point Road Dike, GZA performed two test borings (GZ-5 and TP-3 Probe) and three test pits (TP-2, TP-3 and TP-4). Additionally, thirteen (13) historical test borings were performed by others in the area (CDM-5, CDM-8, B-2, B-3, B-6, B-7, B-8, BH-215, BH-217, BH-227, BH-228, BH-367, and BH-368). Based on the subsurface explorations, subsurface conditions along the Beacon Point Road Dike generally consist of the following, in order of increasing depth:

- FILL – Fill was encountered at each test boring and ranged from 1.6- to 15-feet-thick. Test Pits TP-3 and TP-4 also encountered fill and were primarily within the Embankment Fill of the existing dike. The Fill generally consisted of sand with up to 35% silt and up to 35% gravel and occasional concrete. Large armor stones were observed at the ground surface at TP-3 and TP-4. Based on the SPT N-values, the Fill has a variable relative density which ranges from loose to very dense. However, the majority of SPT N-values indicate a medium dense to dense material.

- ORGANICS –Organic soil was not encountered in any of the test borings or test pits.

- OUTWASH DEPOSITS- Outwash Deposits were encountered in each of the test borings at a depth of 1.6- to 15-feet-deep. The top of the Outwash Deposits ranged from El. 8.0 to -5.5 feet NAVD88. Outwash Sand gradation was variable and generally ranged from brown, fine to medium or fine to coarse sand with up to 30 percent silt and up to 30 percent gravel to a fine sand with up to 50 percent silt. Based on the SPT N-values, the Outwash Deposits have a variable relative density which ranged from loose to very dense. However, the majority of SPT N-values indicate a medium dense to dense material.

- GLACIAL TILL – Glacial Till was encountered below the Outwash Deposit at GZ-5 and CDM-8. Glacial Till generally consisted of grey silt with up to 35 percent fine to medium sand, and up to 20 percent gravel. Based on SPT N-values, the relative density of the Glacial Till ranged from medium dense to very dense. The top of Glacial Till was encountered at El. -16.5 to -19.9 feet NAVD88.

- BEDROCK - Bedrock was inferred with auger and SPT refusal at TP-3 Probe and confirmed at GZ-5 with a five-foot long core sample. The bedrock generally consisted of hard, slightly weathered, slightly to moderately fractured, fine to medium grained, grey GNEISS. The core recovery was 95 percent. The Rock Quality Designation (RQD) was 85 percent. The RQD is defined as the sum of all rock core pieces over 4-inches in length divided by the length of the core run. Rock core photographs are provided in **Appendix D**.

  Depth to bedrock along the Beacon Point Road Levee varies significantly. Boring BH-367 encountered refusal on possible bedrock at 11 feet below grade (El. -0.8 feet NAVD88). Bedrock in the other borings (where encountered) ranged from 25.5- to 37-feet below grade (El. -16.5 to -27 feet NAVD88).

4.2 NORTH ROAD DIKE

Within the area of the North Road Dike, GZA performed one test boring (GZ-1(OW)) and one test pit (TP-5). An additional twelve (12) historical test borings were performed in the area (CDM-1, CDM-2, BH-231, BH-238, BH-369, BH-370, BH-371, BH-372, BH-373, BH-374, BH-375, BH-377). Based on the results of the subsurface explorations, subsurface conditions at the North Road Dike generally consist of the following, in order of increasing depth:

- FILL – Fill was encountered at each test boring and ranged from 1.5- to 15-feet-thick. Test Pit TP-5 encountered 2-feet of Armor Stone Fill over Embankment Fill as part of the existing dike. The Fill generally consisted of sand with up to 35 percent silt and up to 35 percent gravel. Based on the SPT N-values, the Fill has a variable relative density

which ranges from loose to very dense. However, the majority of SPT N-values indicate a medium dense to dense material.

- ORGANICS – Organic deposits were encountered at GZ-1(OW) and were estimated to be 15-feet thick. The Organics consisted of 8-feet of Organic Silt over 7-feet of Fibrous Peat. At GZ-1(OW), SPT N-values ranged from 4 to 7 blows per foot in the Organics indicating a soft or medium stiff consistency. Organic deposits were reported at historical test boring locations to range from 5.5- to 25-feet thick. The top of the Organics in the GZA and past borings by others was between EL. +2 to -7 feet NAVD88, and the bottom was between El. -4.1 to -25.4 feet NAVD88. The Organic deposits were generally located between approximately Sta 3+50 and 10+84 (end of segment) on Figure 2.

- OUTWASH DEPOSITS- Outwash Deposits were encountered in all test borings at a depth of 1.6- to 15-feet-deep. The top of the Outwash Deposits ranged from El. 8.1 to -25.4 feet NAVD88. Outwash Sand gradation was variable and generally ranged from brown, fine to medium or fine to coarse sand with up to 30 percent silt and up to 30 percent gravel to a fine sand with up to 50 percent silt. Based on the SPT N-values, the Outwash Deposits have a variable relative density which ranges from loose to very dense. However, the majority of SPT N-values indicate a medium dense to dense material.

- BEDROCK - Bedrock was not encountered in GZA explorations within the North Road Dike area. At previous boring locations CDM-1 and CDM-2, bedrock was confirmed and inferred respectively with bedrock between 63.5- and 73-feet below grade, corresponding to elevations between El. -43.2 and -64 feet NAVD88, respectively.

4.3 BIRDSEYE STREET DIKE

Within the area of the Birdseye Street Dike, GZA performed four test borings (GZ-1 (OW), GZ-2, GZ-2A and GZ-3). GZ-1 is near the corner of North Road Dike and Birdseye Street Dike, near STA 0+00 of the Birdseye Street Dike. One test Pit (TP-1) was excavated near the east end of the Birdseye Street Dike. An additional twelve (12) historical test borings were performed in the area (CDM-6, BH-14, BH-119, BH-150, BH-236, BH-237, BH-360, BH-376, BH-378, BH-379, BH-380, BH-381). Based on the results of the subsurface explorations, subsurface conditions at this location generally consist of the following, in order of increasing depth:

- FILL – Fill was encountered within all test borings and test pits within this area except BH-119 which encountered organic silt at the ground surface. The fill ranged from 4- to 27-feet thick and the bottom of Fill was between El. +14.8 to -34.4 feet NAVD 88. The Fill generally consisted of granular soil with varying amounts of gravel, sand, and silt, and occasional concrete. The Fill had a relative density of medium dense to dense. Concrete rubble was encountered in the Fill at GZ-2 and GZ-3. Based on the historical plans, GZ-2 and GZ-3 were located on former tanks and the concrete rubble is likely remnants of these past structures. The concrete rubble was approximately 10-feet thick at GZ-2 and 2.2-feet thick at GZ-3. Organic sludge was also observed in the fill directly above the concrete rubble at GZ-3. GZ-2A was drilled between GZ-2 and GZ-3 to evaluate the presence of the concrete rubble between the two borings and GZ-2A did not encounter the concrete rubble fill.

- ORGANICS – Organic deposits were encountered at GZ-1(OW) and at previous test boring locations BH-376, BH-237, BH-150, BH-119, BH-380, BH-381, BH-14, and BH-360 from 0- to 15-feet below grade. The top of organics ranged between about El. +17.9 to -8.9 feet NAVD88. The Organic deposits were encountered from approximately Sta 0+00 to 0+92 and then from Sta 3+24 to 4+54 at the end of the segment on Figure 2. The organic deposits consisted of organic silt, fibrous peat and fine-grained peat and had a consistency of soft to medium stiff.

- OUTWASH DEPOSITS- Outwash Deposits were encountered in all test borings at a depth of 3.0- to 42-feet-deep. The top of the Outwash Deposits ranged from El. +14.9 to -34.4 feet NAVD88. Outwash Sand gradation was variable and generally ranged from brown, fine to medium or fine to coarse sand with up to 30 percent silt and up to 30 percent gravel to a fine sand with up to 50 percent silt. Based on the SPT N-values, the Outwash Deposits have a variable relative density which ranges from loose to very dense. However, the majority of SPT N-values indicate a medium dense to dense material.

4.4 BEACON POINT ROAD LEVEE

Within the area of the Beacon Point Road Levee, GZA performed one test boring (GZ-4(OW)) and two test pits (TP-1 and TP-6). An additional twelve (12) historical test borings were performed in the area (BH-111, BH-225, BH-233, BH-234, BH-242, BH-361, BH-362, BH-363, BH-364, BH-365, BH-366, and BH-382). Based on the results of our subsurface exploration program, the subsurface conditions at the site generally consist of the following, in order of increasing depth:

- FILL – Fill was encountered below topsoil or asphalt at each exploration except BH-364 and ranged from about 1- to 14-feet thick. The Fill generally consisted of sand with up to 35 percent silt and up to 35 percent gravel. Based on the SPT N-values, the Fill has a variable relative density which ranges from loose to very dense. However, the majority of SPT N-values indicate a medium dense to dense material.

  Test pit TP-1 encountered fill consisting of Embankment Fill as part of the existing dike. The Embankment Fill consisted of fine to coarse gravel with some fine to coarse Sand, little silt and included concrete, rebar, and plastic fragments. An approximately 24-inch by 8-inch by 8-inch concrete block was encountered at approximately 2 feet below grade.

- ORGANICS – Organic deposit consisting of fine-grained peat was observed at GZ-4(OW) from 14 to 16-feet below grade, or EL. -2 to -4 feet NAVD88. The density of the of the Organic Silt was Medium Stiff with SPT value of 5 blows per foot. The past borings in the area except BH-233 and BH-382 documented organic materials, ranging in thickness from 2 to 23-feet thick. The SPT values and density of organics in the past borings were similar to the GZA borings. Organics were observed from Sta 0+00 to 4+30 and from 5+52 to 6+46 at the end of the segment.

- OUTWASH DEPOSITS- Outwash Deposits were encountered in all test borings except BH-366 which terminated in the Fill. The Outwash Deposits were encountered at a depth of 4- to 30-feet which corresponds to El. +4.5 to -23.1 feet NAVD88. The Outwash Sand gradation was variable and generally ranged from brown, fine to medium or fine to coarse sand with up to 30 percent silt and up to 30 percent gravel to a fine sand with up to 50 percent silt. Based on the SPT N-values, the Outwash Deposits have a variable relative density which ranges from loose to very dense. However, the majority of SPT N-values indicate a medium dense to dense material.

- BEDROCK – Bedrock was inferred at test borings GZ-4 and BH-382 based on drilling refusal. At GZ-4, roller bit refusal was encountered at 63.5-feet below grade (El. -63.5 feet NAVD88) and at BH-382 refusal was reported at 21-feet below grade (El. -16.2 feet NAVD88).

4.5 GROUNDWATER

Groundwater measurements were attempted in each of the GZ-series test borings during drilling. Groundwater was measured at a depth of 4.5 to 11.4 -feet below ground surface during drilling at borings GZ-1(OW), GZ-2, GZ-2A, GZ-3, GZ-4 (OW), and GZ-5, corresponding to El. -3.8 to +2.5 feet NAVD88. The lower groundwater elevation was at GZ-3 and the highest was at GZ-1(OW). The variation may likely be influenced by the tidal cycle of the Housatonic River.

Several groundwater measurements were obtained in the temporary observation wells at GZ-1(OW) and GZ-4 (OW). The water level in GZ-1(OW) varied from 4.1 to 4.5-feet below grade corresponding to elevations of El. +2.9 to +2.5 feet NAVD88 when measured between April 4 and 14, 2022. The water level in GZ-4(OW) varied from 10.9- to 11.4-feet below grade corresponding to elevations of El. +1.1 to +0.6 feet NAVD88 when measured between April 8 and 14, 2022. Groundwater measurements in the observation wells are shown on **Table 3**. It should be noted that water levels will vary due to seasonal and climatic fluctuations, tides, changes caused by construction, stabilization time and other factors different from those existing at the time the observations were made.

5.0 GEOTECHNICAL LABORATORY TEST RESULTS

5.1 MOISTURE CONTENT AND ATTERBERG LIMITS

Twelve (12) moisture contents were performed, including four from the Shelby tube samples from GZ-1(OW) ST[2]-1 and GZ-1(OW) ST-2. The moisture content results varied from 47% to 515%. The samples from the Shelby tubes had a variable moisture content. The organic silt from GZ-1(OW) ST-1 had moisture contents between 182% and 417%. The fibrous peat from GZ-1(OW) ST-2 had moisture contents between 328% and 525%. The wide range of moisture content suggest the material is non-homogenous and locally affected by the organic contents.

Six Atterberg limits were performed. The tests indicated samples GZ-1(OW) SS-7 and GZ-4 SS-7 were non-plastic (ML) . The samples from GZ-1(OW) ST-1, GZ-1(OW) ST-2, GZ-1(OW) SS-9, and GZ-3 SS5 indicted high liquid limit silt (MH).

Laboratory reports are included in **Appendix F.**

5.2 CONSOLIDATION

Two samples were tested for consolidation as noted in Section 3 above. One sample was of Organic Silt and one sample was of Fibrous Peat. The consolidation results are included in **Appendix F.** The samples were normally consolidated and reported consolidation properties for the Organic Silt and Fibrous peat layers are summarized below.

Boring and Sample ID	Sample Depth (feet)	Soil Description	Initial Void Ratio, e_o	Primary Compression Index, C_c	Secondary Compression Index, C_α	Coefficient of Consolidation, c_v (ft^2/sec)
GZ-1(OW), ST-1	17-19	Organic Silt	3.53	1.28	0.085	$1.5x10^{-7}$
GZ-1(OW), ST-2	21-23	Fibrous Peat	12.79	6.14	0.34	$1.23x10^{-5}$

[2] ST-Tube Sample
SS-Split Spoon Sample

5.3 UNCONFINED COMPRESSIVE STRENGTH

An unconfined, undrained compressive strength test was performed on two soil samples (GZ-1(OW), ST-1 and GZ-1(OW), ST-2). Three confining pressures were tested (4, 8, and 16 psi) for sample GZ-1(OW), ST-1 in the organic silt. Due to limited sample recovery, only two confining pressures were possible (4 and 8 psi) for sample GZ-1(OW), ST-2 in the fibrous peat. The laboratory test results are provided in **Appendix F**. The following test shear strength test results were provided:

- Organic Silt: 1,440 psf
- Fibrous Peat: 280 psf

5.4 HYDRAULIC CONDUCTIVITY

GZA performed hydraulic conductivity tests in each of the five of the six test borings at varying depths and elevations. The tests were performed in general accordance with ASTM D4044 - Standard Test Method for (Field Procedure) Instantaneous Change in Head (Slug) Tests For Determining Hydraulic Properties of Aquifers. The infiltration testing was performed using a 4-inch inside diameter, flush joint casing. Clean water was used to flush the soil from within the casing and the water level was checked after 10 to 15 minutes. Following the flush, the falling head testing was performed by filling the casing with water and recording the depth to water and measuring the drop in water level at 30 second to 1-minute intervals, then 1- to 3-minute intervals for up to 25 minutes. The falling head test results were evaluated in accordance with ASTM D5912 - Standard Practice for (Analytical Procedure) Determining Hydraulic Conductivity of an Unconfined Aquifer by Overdamped Well Response to Instantaneous Change in Head (Slug). Falling head test results from GZ-2 to GZ-5 indicate hydraulic conductivity values ranging from 8.65×10^{-3} to 1.38×10^{-4} centimeters per second (cm/sec). **Table 4** presents the falling head test results for these test borings.

GZA also used empirical correlations with grain size distribution to estimate hydraulic conductivity (i.e., Kozeny Carmen method and Hazen method) on three soil samples collected from GZ-2, GZ-2A, and GZ-5, on two soil samples collected from TP-3 and TP-6, and on five previous gradation analyses included in a report by CDM[3]. The Hazen method is based on the D_{10} grain size, and the Kozeny-Carman method is based on the surface area and proportional distribution of grain sizes. The estimated hydraulic conductivity by grain size analysis using the Kozeny-Carman and the Hazen method are presented on **Table 5**.

The one-dimensional consolidation test performed on soils samples GZ-1, ST-1 and GZ-1, ST-2 provided an estimate of vertical hydraulic conductivity for the Organic Silt and Fibrous Peat. The Organic Silt had an estimated vertical hydraulic conductivity of $k_v = 1.33 \times 10^{-8}$ cm/sec, and the Fibrous Peat had an estimated vertical hydraulic conductivity of $k_v = 2.03 \times 10^{-8}$ cm/sec at the test load of 1 ton per square foot**.**

5.5 SOIL DENSITY AND OBSTRUCTIONS

The ArcelorMittal Piling Handbook provides a preliminary assessment for sheet pile drivability using SPT values. For this assessment, SPT values were compared to driving guidance in the Piling Handbook. GZA plotted the SPT values from the previous test borings with depth for each of the four flood improvement segments. The plots are provided in **Appendix H**. The plots show that the SPT value and corresponding soil density are variable and range from loose to very dense, but the majority of the SPT values are loose to medium dense (SPT value of 10 to 30). The comparison of SPT values to drivability guidelines indicates that sheet piles can be driven for the project. However, the sheet piles may have to be driven with an impact hammer and high yield strength steel sheet piles may be required in areas where dense soils or

[3] CDM, "Town of Stratford, Water Pollution Control Upgrade, Stratford, Connecticut, Geotechnical Design Report", dated August 12, 2005.

gravel and cobbles are present. This analysis is intended to be a comparison of observed data to published references for consideration in future design phases and should not be used for bidding or productivity estimates.

Relatively shallow bedrock was encountered in the southeastern area of the site in GZA test borings GZ-5 and TP-3 PROBE. Bedrock was inferred with auger and SPT refusal at TP-3 Probe and confirmed at GZ-5 with a five-foot long core sample. Bedrock was also encountered in the previous test borings CDM-5, CDM-8, and BH-228. Bedrock in the GZA and previous tests borings ranged from 24.5 to 37.0 feet below grade corresponding to elevation of El. -14.8 to -27.0 feet NAVD88. Previous test boring BH-367 encountered shallow refusal 11 feet below grade corresponding to El. -0.8 feet NAVD88. Grey rock fragments were reported in the split spoon, but bedrock was not confirmed with a bedrock core. The refusal could be due to either a cobble or boulder or bedrock. Bedrock and boring refusal indicate consolidated materials that will not be penetrable with pile driving.

As an alternative to sheet pile walls, GZA proposes concrete L walls supported on piles. Where feasible, earthen dikes or levees are also proposed to minimize wall height and length. The piles for wall support would be micropiles, helical piles, or grout displacement piles (such as Drivecast piles). These piles allow for drilling and be better suited for dense soils. The pile spacing also better accommodates possible obstructions and dense soils as compared to a continuous sheet pile system.

5.6 EXISTING LEVEE AND DIKE CONSTRUCTION

Six test pits (TP-1 through TP-6) were excavated to evaluate the consistency of the Impervious Fill and to evaluate the presence of cobbles, boulders or other debris that may obstruct sheet pile installation. Several of the test pits encountered armor stone on the existing dike and levee embankments and some of these stones were observed to be several feet in dimensions. The armor stone along the existing levee and dike embankments will require temporary removal from in line with the alignment of the proposed flood wall to allow driving from the grounds surface.

Typical embankment sections for the existing dikes and levees are presented on GZA Sheet No. G-301 of the May 2020 Conceptual Design Plans (after Hurricane Protection for Water Pollution Control Plant, Sheet D-6, Prepared by CE Maguire, Inc, Dated around 1975). The test pits allowed GZA to observe and document the embankment composition and to collect soil samples. The specifications for embankment soil gradation, compaction, and construction documentation were not available. Based on our test pit observations, the levee and dike embankments appear to have been constructed in accordance with the general strata as shown on the past plans with details as discussed in the following paragraphs.

Parts of the levee and dike embankments include: Topsoil, riprap armor stone at select areas requiring protection, gravel bedding, and impervious fill. We anticipate that the armor stone, cobbles and boulders, where encountered, will require pre-excavation in advance of sheet pile driving.

Topsoil was observed in Test Pits TP-1, TP-2, TP-3, and TP-4, and is generally thicker than indicated on the past plans with thickness of topsoil between 0.75- and 2-feet in the levee and dike embankments. The topsoil was observed to cover armor stone at Test Pits TP-3 and TP-4, along Beacon Point Road. The observed topsoil thickness within the test pits and presence above armor stone indicates that topsoil was added or installed to thicker depths than suggested on the 1975 plans.

Armor stone was observed in Test Pits TP-3, TP-4, TP-5, and TP-6. The armor stone was generally a layer of heavy stone between 1 and 2 feet thick. The armor stone appeared to have been set and placed to interlock and fit with the adjoining stones.

The gravel bedding was not observed as a distinct layer in the test pits. Boulder and cobbles were encountered in three of the six test pits within the embankment fill as documented on the test pit logs.

Impervious Fill is called out on the 1975 plans within the levee and dike fill. This material was probed by test pits and test borings GZ-2 and GZ-4 penetrated areas and depths indicated on the past plans to be Impervious Fill. Samples noted above for gradation testing at boring GZ-2 sample SS-2 and test pits TP-3 sample S-2, and TP-6, S-2 are representative of levee or dike embankment fill. The silt content of these samples ranged from 8.2% to 27.5% (see Section 3). The hydraulic conductivity ranges from estimated values of 6.32×10^{-4} to 2.81×10^{-3} cm/sec (see Table 5). The material generally has a poor drainage or low hydraulic conductivity and could likely be called semipervious in place of impervious based on samples and material explored.

CLOSING

We trust this report meets your project needs and we appreciate the opportunity to work for you on this project. Please contact the Mr. Christopher Eggers (203-910-9170) or Mr. David Barstow (860-250-2131) if you have any questions.

Tables

TABLE 1

SUMMARY OF TEST BORING EXPLORATION DATA - GZA TEST BORINGS

Water Pollution Control Facility Perimeter Flood Wall Improvements

Stratford, Connecticut

	Subsurface Exploration						
Test Boring I.D.	GZ-1	GZ-2	GZ-2A	GZ-3	GZ-4	GZ-5	TP-3 PROBE
Company:	GZA	GZA	GZA	GZA	GZA	GZA	GZA
Drilled by:	ST	ST	ST	ST	ST	ST	ST
Year Performed	2022	2022	2022	2022	2022	2022	2022
Depth (ft) to:							
Fill	0	0	0	0	0	0	0
Organics	15.0	NE	NE	NE	14.0	NE	NE
Outwash Deposits	30.0	27.0	6.0	14.0	16.0	4.5	5.0
Glacial Till	NE	NE	NE	NE	NE	26.5	NE
Bedrock[1]	NE	NE	NE	NE	63.5 R	29.6	37 R
Groundwater[2]	4.5	10.7	7.6	10.8	11.4	10.3	NE
Bottom of Exploration	42.0	47.0	32.0	37.0	63.5 R	34.6	37.0 R
Thickness (ft) of:							
Fill	15.0	27.0	6.0	14.0	14.0	4.5	5.0
Organics	15.0	NE	NE	NE	2.0	NE	NE
Outwash Deposits	12.0	20.0	26.0	23.0	47.5	30.1	32.0
Glacial Till	NE	NE	NE	NE	NE	3.1	NE
Approximate Elevations (ft):							
Ground Surface[3] (NAVD88)	7	11	7.0	7	12	10	10
Top of Fill	7	11	7.0	7	12	10	10
Top of Organics	-8	NE	NE	NE	-2	NE	NE
Top of Outwash Deposits	-8	-16	1.0	-7	-4	5.5	5
Top of Glacial Till	NE	NE	NE	NE	NE	-16.5	NE
Bedrock	<-35.0	<-36.0	NE	<-30.0	-51.5	-24.6	-27
Groundwater[2]	2.5	-16	-0.6	-3.8	0.6	-0.3	NE
Bottom of Exploration	-35.0	-36.0	-25.0	-30.0	-51.5	-24.6	-27.0

NE- Not Encountered

R - Boring terminated on Auger, Roller Bit or Spoon Refusal

ST-Soil Testing, Inc.

Notes:

1. Bedrock inferred at GZ-4 and TP-3 Probe based on refusal.
2. Groundwater readings were taken at the times noted on the logs.
3. Elevations approximated by interpolation from existing topographic plan. Elevations Reference NAVD88

TABLE 2A

SUMMARY OF TEST EXPLORATION DATA ALONG BEACON POINT ROAD DIKE

Water Pollution Control Facility Perimeter Flood Wall Improvements

	BEACON POINT ROAD DIKE SUBSURFACE EXPLORATIONS														
Test Boring I.D.	CDM-5	CDM-8	GZ-5	BH-367	B-8	BH-228	B-7	TP-3 PROBE	BH-215	BH-368	B-6	BH-227	BH-217	B-3	B-2
Company:	CDM	CDM	GZA	CE Mag	CE Mag	CE Mag	CE Mag	GZA	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag
Drilled by:	GB	GB	ST	AD	GB	AD	GB	ST	AD	AD	GB	AD	AD	GB	GB
Year Performed	2004	2004	2022	1972	1980	1969	1980	2022	1969	1972	1980	1969	1969	1980	1980
Depth (ft) to:															
Fill	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Organics	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Outwash Deposits	15.0	12.0	4.5	5.0	2.0	4.0	2.5	5.0	1.6	2.0	2.5	2.0	4.0	2.5	3.0
Glacial Till	NE	30.0	26.5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Bedrock	R	R	29.6	R	NE	24.5	NE	37 R	NE	NE	NE	66.0	NE	NE	NE
Groundwater[2]	6.0	NE	10.3	4.0	8.5	7.6	8.0	NE	9.0	8.0	12.0	9.5	6.0	13.0	9.0
Bottom of Exploration	25.5	36	34.6	11.0	10.0	34.5	10.0	37.0 R	25.5	31.5	20.0	76.0	25.5	16.5	20.0
Thickness (ft) of:															
Fill	15.0	12.0	4.5	5.0	2.0	4.0	NE	5.0	1.6	2.0	2.5	2.0	4.0	2.5	3.0
Organics	NE	NE	NE	NE	NE	NE	2.5	NE	NE	75.0	NE	NE	NE	NE	NE
Outwash Deposits	10.5	24.0	30.1	6.0	8.0	20.5	7.5	32.0	23.9	29.5	17.5	54.0	21.5	14.0	17.0
Glacial Till	NE	6.0	3.1	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Approximate Elevations (ft):															
Ground Surface[3] NAVD88	9.5	9.0	10	10.2	10	9.7	9.4	10	8.9	8.1	9.4	8.6	7.9	8.4	8.7
Top of Fill	9.5	9.0	10	10.2	10	9.7	NE	10	8.9	8.1	9.4	8.6	7.9	8.4	8.7
Top of Organics	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Top of Outwash Deposits	-5.5	-3.0	5.5	5.2	8.0	5.7	6.9	5.0	7.3	6.1	6.9	6.6	3.9	5.9	5.7
Top of Glacial Till	NE	-21.0	-16.5	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Bedrock	-16	-27.0	-24.6	-0.8	<0	-14.8	<-0.6	-27	<-16.1	<-23.4	<-10.6	-57.4	<-17.6	<-8.1	<-11.3
Groundwater[2]	3.5	NE	-0.3	6.2	1.5	2.1	1.4	NE	-0.1	0.1	-2.6	-0.9	1.9	-4.6	-0.3
Bottom of Exploration	-16.0	-27.0	-24.6	-0.8	0.0	-24.8	-0.6	-27.0	-16.6	-23.4	-10.6	-67.4	-17.6	-8.1	-11.3

NE - Not Encountered NR-Not Recorded GB - General Borings, Inc. GB - General Borings, Inc. AD- American Drilling & Boring Co., Inc.

R-Boring Refusal CE Mag - CE Maguire, Inc., or C.E. Maguire & Associates (Some logs referred to as C.A. Maguire & Associates).

Notes:

1. CDM Borings reference the Town of Stratford datum, 100 feet above Mean Sea Level, and are converted to NAVD88. El. 0.0 ft NGVD29 = -1.1 ft NAVD88.
2. Groundwater readings were taken at the times noted on the logs.
3. No datum for B- and BH- series borings was referenced, are approximate to MSL/NGVD29 datum based on time period and past topography and converted to NAVD88. El. 0.0 ft NGVD29 = -1.1 ft NAVD88. Elevations of GZ-borings approximated by interpolation from existing topographic plan.

TABLE 2B

SUMMARY OF TEST EXPLORATION DATA ALONG NORTH ROAD DIKE

Water Pollution Control Facility Perimeter Flood Wall Improvements

	NORTH ROAD DIKE SUBSURFACE EXPLORATIONS												
Test Boring I.D.	CDM-1	BH-369	CDM-2	BH-370	BH-371	BH-372	BH-373	BH-374	BH-231	BH-375	BH-238	GZ-1 (OW)	BH-377
Company:	CDM	CE Mag	CDM	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag	GZA	CE Mag
Drilled by:	GB	AD	GB	AD	AD	AD	AD	AD	AD	AD	AD	ST	AD
Year Performed	2004	1972	2004	1972	1972	1972	1972	1972	1969	1972	1969	2022	1972
Depth (ft) to:													
Fill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Organics	NE	NE	NE	NE	8.0	10.5	9.0	10.0	14.0	12.0	3.0	15.0	6
Outwash Deposits	3.5	1.5	6.0	10.0	17.0	23.0	19.0	24.0	19.5	30.0	28.0	30.0	18
Glacial Till	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Bedrock	53.0	NE	R	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Groundwater[2]	9.0	7.5	6.0	8.3	6.5	7.2	5.0	5.1	1.5	4.0	0.5	4.5	4.5
Bottom of Exploration	63.5	31.5	73.0	31.6	26.5	31.5	26.5	31.5	26.5	36.5	36.5	42.0	21.5
Thickness (ft) of:													
Fill	3.5	1.5	6.0	10.0	8.0	10.5	9.0	10.0	14.0	12.0	3.0	15.0	6.0
Organics	NE	NE	NE	NE	9.0	12.5	10.0	14.0	5.5	75.0	25.0	15.0	12.0
Outwash Deposits	46.0	30.0	67.0	21.6	9.5	8.5	7.5	7.5	7.0	6.5	8.5	12.0	3.5
Glacial Till	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Approximate Elevations (ft):													
Ground Surface[3] NAVD88	9.8	9.6	9.0	-	7.9	6.8	6.5	4.8	6.6	5.6	2.6	7.0	4.6
Top of Fill	9.8	9.6	9.0	-	7.9	6.8	6.5	4.8	6.6	5.6	2.6	7.0	4.6
Top of Organics	NE	NE	NE	-	-0.1	-3.7	-2.5	-5.2	-7.4	-6.4	-0.4	-8.0	-1.4
Top of Outwash Deposits	6.3	8.1	3.0	-	-9.1	-16.2	-12.5	-19.2	-12.9	-24.4	-25.4	-23.0	-13.4
Top of Glacial Till	NE	NE	NE	-	NE	NE	NE	NE	NE	NE	NE	NE	NE
Bedrock	-43.2	<-21.9	-64.0	-	<-18.6	<-24.7	<-20	<-26.7	<-19.9	<-30.9	<-33.9	<-35.0	<-16.9
Groundwater[2]	-52.2	2.1	3.0	-	1.4	-0.4	1.5	-0.3	5.1	1.6	2.1	6.4	0.1
Bottom of Exploration	-92.7	-21.9	-64.0	-	-18.6	-24.7	-20.0	-26.7	-19.9	-30.9	-33.9	-31.1	-16.9

NE - Not Encountered NR-Not Recorded GB - General Borings, Inc. GB - General Borings, Inc. AD- American Drilling & Boring Co., Inc.

R-Boring Refusal CE Mag - CE Maguire, Inc., or C.E. Maguire & Associates (Some logs referred to as C.A. Maguire & Associates).

Notes:

1. CDM Borings reference the Town of Stratford datum, 100 feet above Mean Sea Level, and are converted to NAVD88. El. 0.0 ft NGVD29 = -1.1 ft NAVD88.
2. Groundwater readings were taken at the times noted on the logs.
3. No datum for B- and BH- series borings was referenced, are approximate to MSL/NGVD29 datum based on time period and past topography and converted to NAVD88. El. 0.0 ft NGVD29 = -1.1 ft NAVD88. Elevations of GZ-borings approximated by interpolation from existing topographic plan.

TABLE 2C

SUMMARY OF TEST EXPLORATION DATA ALONG BIRDSEYE STREET DIKE

Water Pollution Control Facility Perimeter Flood Wall Improvements

	BIRDSEYE STREET DIKE SUBSURFACE EXPLORATOINS															
Test Boring I.D.	GZ-1 (OW)	BH-376	BH-378	BH-237	BH-150	CDM-6	BH-236	BH-119	BH-379	GZ-2	GZ-2A	GZ-3	BH-380	BH-381	BH-14	BH-360
Company:	GZA	CE Mag	CE Mag	CE Mag	CE Mag	CDM	CE Mag	CE Mag	CE Mag	GZA	GZA	GZA	CE Mag	CE Mag	CE Mag	CE Mag
Drilled by:	ST	AD	AD	AD	AD	GB	AD	AD	AD	ST	ST	ST	AD	AD	AD	AD
Year Performed	2022	1972	1972	1969	1969	2004	1969	1968	1972	2022	2022	2022	1972	1972	1967	1972
Depth (ft) to:																
Fill	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NE	0	0	0	0	0	0	0	0
Organics	15.0	14.0	NE	4.0	6.0	NE	NE	0.0	NE	NE	NE	NE	7.5	9.0	14.0	11.0
Outwash Deposits	30.0	28.0	5.0	7.5	12.0	7.0	10.0	3.0	4.0	27.0	6.0	14.0	15.0	35.0	42.0	40.0
Glacial Till	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Bedrock	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Groundwater[2]	4.5	4.3	6.8	4.2	4.8	9.0	5.0	1.3	3.5	10.7	7.6	10.8	3.5	3.0	5.0	5.0
Bottom of Exploration	42.0	35.5	36.5	16.5	30.5	120.0	26.5	10.0	25.0	47.0	32.0	37.0	20.0	40.0	45.0	45.0
Thickness (ft) of:																
Fill	15.0	14.0	5.0	4.0	6.0	7.0	10.0	NE	4.0	27.0	6.0	14.0	7.5	9.0	14.0	11.0
Organics	15.0	14.0	NE	3.5	6.0	NE	NE	3.0	NE	75.0	NE	NE	7.5	26.0	28.0	29.0
Outwash Deposits	12.0	7.5	31.5	9.0	18.5	113.0	16.5	7.0	21.0	20.0	26.0	23.0	5.0	5.0	3.0	5.0
Glacial Till	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Approximate Elevations (ft):																
Ground Surface[3] NAVD88	7.0	5.1	5.9	5.7	5.6	8.0	6.5	17.9	6.1	11.0	7.0	7.0	6.7	5.7	NR	5.6
Top of Fill	7.0	5.1	5.9	5.7	5.6	8.0	6.5	NE	6.1	11.0	7.0	7.0	6.7	5.7	-	5.6
Top of Organics	-8.0	-8.9	NE	1.7	-0.4	NE	NE	17.9	NE	NE	NE	NE	-0.8	-3.3	-	-5.4
Top of Outwash Deposits	-23.0	-22.9	0.9	-1.8	-6.4	1.0	-3.5	14.9	2.1	-16.0	1.0	-7.0	-8.3	-29.3	-	-34.4
Top of Glacial Till	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	-	NE
Bedrock	<-35.0	<-30.4	<-30.6	<-10.8	<-24.9	<-112	<-20	<7.9	<-18.9	<-36.0	NE	<-30.0	<-13.3	<-34.3	-	<-39.4
Groundwater[2]	-4.5	0.9	-0.9	1.5	0.8	-1.0	1.5	16.6	2.6	-16.0	-0.6	-3.8	3.2	2.7	-	0.6
Bottom of Exploration	-42.0	-30.4	-30.6	-10.8	-24.9	-112.0	-20.0	7.9	-18.9	-36.0	-25.0	-30.0	-13.3	-34.3	-	-39.4

NE - Not Encountered NR-Not Recorded GB - General Borings, Inc. GB - General Borings, Inc. AD- American Drilling & Boring Co., Inc.

R-Boring Refusal CE Mag - CE Maguire, Inc., or C.E. Maguire & Associates (Some logs referred to as C.A. Maguire & Associates).

Notes:

1. CDM Borings reference the Town of Stratford datum, 100 feet above Mean Sea Level, and are converted to NAVD88. El. 0.0 ft NGVD29 = -1.1 ft NAVD88.
2. Groundwater readings were taken at the times noted on the logs.
3. No datum for B- and BH- series borings was referenced, are approximate to MSL/NGVD29 datum based on time period and past topography and converted to NAVD88. El. 0.0 ft NGVD29 = -1.1 ft NAVD88. Elevations of GZ-borings approximated by interpolation from existing topographic plan.

TABLE 2D

SUMMARY OF TEST EXPLORATION DATA ALONG BEACON POINT ROAD LEVEE

Water Pollution Control Facility Perimeter Flood Wall Improvements

	BEACON POINT ROAD LEVEE SUBSURFACE EXPLORATIONS												
Test Boring I.D.	BH-234	BH-225	BH-361	GZ-4	BH-111	BH-242	BH-233	BH-362	BH-382	BH-365	BH-363	BH-366	BH-364
Company:	CE Mag	CE Mag	CE Mag	GZA	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag	CE Mag
Drilled by:	AD	AD	AD	ST	AD	AD	AD	AD	AD	AD	AD	AD	AD
Year Performed	1969	1969	1972	2022	1967	1969	1969	1972	1972	1972	1972	1972	1972
Depth (ft) to:													
Fill	0	0	0	0	0	0	0	0	0	0	0	0	NE
Organics	12.5	3.0	4.0	14.0	7.0	2.5	NE	6	NE	1.0	3.0	2.0	0.0
Outwash Deposits	30.0	12.0	27.0	16.0	9.0	17.0	8.0	14	4.0	4.0	11.5	NE	10.0
Glacial Till	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Bedrock	NE	NE	NE	63.5 R	NE	NE	NE	NE	R	NE	NE	NE	NE
Groundwater[2]	3.2	8.5	5.0	11.4	5.0	2.8	4.4	8	5.7	5.5	6.0	NE	7.3
Bottom of Exploration	35.0	80.0	35.0	63.5	20.0	22.0	21.5	26.5	25.0	20.0	20.0	8.0	16.5
Thickness (ft) of:													
Fill	12.5	3.0	4.0	14.0	7.0	2.5	8.0	6.0	4.0	1.0	3.0	2.0	NE
Organics	17.5	9.0	23.0	2.0	2.0	14.5	NE	8.0	NE	75.0	8.5	6.0	10.0
Outwash Deposits	5.0	68.0	8.0	47.5	11.0	5.0	13.5	12.5	21.0	16.0	8.5	NE	6.5
Glacial Till	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Approximate Elevations (ft):													
Ground Surface[3] NAVD88	6.9	5.9	5.6	12	6.5	3.8	7.9	7.0	6.6	8.5	8.5	8.5	10.3
Top of Fill	6.9	5.9	5.6	12	6.5	3.8	7.9	7.0	6.6	8.5	8.5	8.5	NE
Top of Organics	-5.6	2.9	1.6	-2	-0.5	1.3	NE	1.0	NE	7.5	5.5	6.5	10.3
Top of Outwash Deposits	-23.1	-6.1	-21.4	-4	-2.5	-13.2	-0.1	-7.0	2.6	4.5	-3.0	NE	0.3
Top of Glacial Till	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Bedrock	<-28.1	<-74.1	<-29.3	-51.5	<-13.5	<-18.2	<-13.6	<-19.5	-18.4	<-11.5	<-11.5	<0.5	<-6.2
Groundwater[2]	3.7	-2.6	0.6	0.6	1.5	1.1	3.5	-1.0	0.9	3.0	2.5	NE	3.0
Bottom of Exploration	-28.1	-74.1	-29.4	-51.5	-13.5	-18.2	-13.6	-19.5	-18.4	-11.5	-11.5	0.5	-6.2

NE - Not Encountered NR-Not Recorded GB - General Borings, Inc. GB - General Borings, Inc. AD- American Drilling & Boring Co., Inc.

R-Boring Refusal CE Mag - CE Maguire, Inc., or C.E. Maguire & Associates (Some logs referred to as C.A. Maguire & Associates).

Notes:

1. CDM Borings reference the Town of Stratford datum, 100 feet above Mean Sea Level, and are converted to NAVD88. El. 0.0 ft NGVD29 = -1.1 ft NAVD88.
2. Groundwater readings were taken at the times noted on the logs.
3. No datum for B- and BH- series borings was referenced, are approximate to MSL/NGVD29 datum based on time period and past topography and converted to NAVD88. El. 0.0 ft NGVD29 = -1.1 ft NAVD88. Elevations of GZ-borings approximated by interpolation from existing topographic plan.

TABLE 3

Water Levels at Observation Wells

Water Pollution Control Facility Flood Protection System Enhancements

Stratford, Connecticut

Observation Well	Date	Time	Depth to Water (ft)	Elevation (ft NAVD88) Approximate
GZ-1	4/4/2022	12:45	4.5	2.5
GZ-1	4/5/2022	7:15	4.25	2.75
GZ-1	4/7/2022	9:15	4.3	2.7
GZ-1	4/7/2022	13:00	4.3	2.7
GZ-1	4/7/2022	15:16	4.4	2.6
GZ-1	4/11/2022	14:15	4.4	2.6
GZ-1	4/14/2022	7:40	4.1	2.9
GZ-4	4/8/2022	15:15	11.4	0.6
GZ-4	4/11/2022	14:20	11	1
GZ-4	4/14/2022	7:40	10.9	1.1

Note:

1. See boring logs for addtitoinal information and other water level observations within borings.

TABLE 4

SUMMARY OF HYDRAULIC CONDUCTIVITY ESTIMATE BY FALLING HEAD TEST

Water Pollution Control Facility Flood Protection System Enhancements

Stratford, Connecticut

Boring & Sample	Depth (ft) below grade	Test Elevation (approx.) NAVD88 ft	Stratum	Soil Description	Hydraulic Conductivity, k (cm/sec)	Hydraulic Conductivity, k (ft/sec)
GZ-2	45	-34	Outwash Deposits	fine to coarse SAND, some fine Gravel, little Silt	2.29E-03	7.50E-05
GZ-3	35	-28	Outwash Deposits	fine SAND, some Silt, trace fine Gravel	3.70E-03	1.22E-04
GZ-4	20	-8	Outwash Deposits	fine to coarse SAND, some fine to coarse Gravel, little Silt	4.50E-03	1.48E-04
GZ-4	25	-13	Outwash Deposits	fine to medium SAND, some Gravel, little Silt	5.73E-03	1.88E-04
GZ-5	15	-3	Outwash Deposits	fine to coarse SAND and GRAVEL, little Silt over fine SAND and SILT	8.65E-03	2.84E-04
GZ-5	28	-18	Glacial Till	SILT, some fine to medium Sand, little Gravel	1.38E-04	4.53E-06
GZ-2A	14	-6	Outwash Deposits	fine to coarse SAND, some Gravel, trace Silt	6.97E-03	2.29E-04
GZ-2A	32	-24	Outwash Deposits	fine to medium SAND, little Silt	1.50E-04	4.94E-06

1. Reference "Joint Departments of the Army, the Air Force, and the Navy, USA, Technical Manual TM 5-818-5/AFM 88-5, Chap 6/NAVFAC P-418, Dewatering and Groundwater Control", November 1983.
2. Reference ASTM D5912 Standard Practice for "Joint Departments of the Army, the Air Force, and the Navy, USA, Technical Manual TM 5-818-5/AFM 88-5, Chap 6/NAVFAC P-418, Dewatering and Groundwater Control", November 1983.

TABLE 5
SUMMARY OF HYDRAULIC CONDUCTIVITY ESTIMATE BY GRAIN SIZE
Water Pollution Control Facility Perimeter Flood Wall Improvements
Stratford, Connecticut

Boring & Sample	Depth (ft) below grade	Laboratory Test	Stratum	Soil Description	Sample Elevation (approx.) NAVD88 ft	Kozeny-Carman Method kv (cm/s)	Hazen Method km (cm/s)
CDM-1 (2004) S-4	15-17	Sieve	Outwash Deposits	fine to medium SAND, trace fine Gravel, trace Silt	-5	5.38E-02	8.70E-02
CDM-2 (2004) S-3	10-12	Sieve	Outwash Deposits	fine to coarse SAND, some fine Gravel, trace Silt	-1	1.19E-01	6.81E-02
CDM-4 (2004) S-2 *	5-7	Sieve *	Fill	fine to medium SAND, some Silt, trace fine Gravel	4	NC	4.90E-03
CDM-6 (2004) S-5	20-22	Sieve	Outwash Deposits	fine to coarse SAND, and fine Gravel, trace Silt	-12	1.33E-01	3.72E-02
CDM-8 (2004) S-2	20-22	Sieve	Outwash Deposits	fine to medium SAND, trace fine Gravel, trace Silt	-11	1.13E-02	7.50E-03
GZ-2 SS-2	2-4	Sieve	Fill (Impervous Embankment Fill)	fine to medium SAND, some Silt, trace Gravel, trace Roots	8	6.32E-04	1.14E-04
GZ-5 SS-5	10-12	Sieve Hydrometer	Outwash Deposits	fine to coarse SAND and GRAVEL, trace Silt	-1	2.12E-01	7.33E-02
GZ-2A SS-5	10-12	Sieve	Outwash Deposits	fine to coarse SAND and GRAVEL, little Silt	-2	1.03E-01	2.42E-02
TP-3 S-2	2-4.5	Sieve Hydrometer	Embankment Fill (Impervious Fill)	fine to medium SAND, some coarse Gravel, little Silt (Embankment Fill)	8.75	1.69E-03	1.94E-03
TP-6 S-2	2	Sieve Hydrometer	Embankment Fill (Impervious Fill)	fine to medium SAND, trace Silt (Embankment Fill)	8	2.81E-03	9.51E-03

NC=Not Calculated
kv = vertical coefficient of permeability
km=bulk/mean of vertical and horizontal permeabilities.
1. Reference: Carrier, W. David III, 'Goodbye, Hazen; hello, Kozeny-Carman', Journal of Geotechnical and Geoenvironmetnal Engineering, November 2003.
2. For CDM 2004 samples, estimates made from grain size distribution of samples provided in report entitled "Town of Stratford, Water Pollution Control Faculty Upgrade, Stratford, Connecticut, Geotechnical Design Report" dated August 12, 2005 prepared by CDM, see test results.
3. Borings GZ- and Test Pits estimated from grain size information obtained by GZA in 2022, see Appendix.
*Sample analysis ends at #200 sieve at 11.6% finer, D_{10} not determined by analysis and was estimated by interpolation from the grain size analysis graph.

TABLE 6

SUMMARY OF SPT VALUES

Water Pollution Control Facility Perimeter Flood Wall Improvements

Stratford, Connecticut

Boring	Top of Sample Depth (ft below grade)	Bottom of Sample Depth (ft below grade)	Sample	SPT Value	Vibro Preliminary Driveability	Impact Preliminary Driveability
GZ-1 (OW)	1	3	SS-1	94	Very Difficult, pre-auger essential	Suitable require HYS
GZ-1 (OW)	3	5	SS-2	90	Very Difficult, pre-auger essential	Suitable require HYS
GZ-1 (OW)	5	7	SS-3	35	Suitable	Suitable
GZ-1 (OW)	7	9	SS-4	16	Easy	Easy
GZ-1 (OW)	9	11	SS-5	2	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-1 (OW)	11	13	SS-6	11	Easy	Easy
GZ-1 (OW)	15	17	SS-7	4	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-1 (OW)	19	21	SS-8	5	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-1 (OW)	23	25	SS-9	6	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-1 (OW)	25	27	SS-10	7	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-1 (OW)	30	32	SS-11	19	Easy	Easy
GZ-1 (OW)	35	37	SS-12	12	Easy	Easy
GZ-1 (OW)	40	42	SS-13	13	Easy	Easy
GZ-14	0	2	SS-1	4	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-14	2	4	SS-2	86	Very Difficult, pre-auger essential	Suitable require HYS
GZ-14	4	6	SS-3	9	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-14	6	10	SS-4	2	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-14	10	12	SS-5	21	Suitable	Suitable
GZ-14	12	15	SS-6	22	Suitable	Suitable
GZ-14	15	17	SS-7	15	Easy	Easy
GZ-14	20	22	SS-8	25	Suitable	Suitable
GZ-14	25	27	SS-9	63	Very Difficult, pre-auger essential	Suitable require HYS
GZ-14	30	32	SS-10	25	Suitable	Suitable
GZ-2	0	2	SS-1	10	Easy	Easy
GZ-2	2	4	SS-2	6	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-2	4	6	SS-3	33	Suitable	Suitable
GZ-2	6	8	SS-4	18	Easy	Easy
GZ-2	8	10	SS-5	16	Easy	Easy
GZ-2	10	12	SS-6	16	Easy	Easy
GZ-2	15	17	SS-7	1	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-2	17	17.2	SS-8	R	Not Driveable	Not Driveable
GZ-2	20	20.2	SS-9	R	Not Driveable	Not Driveable
GZ-2	25	25.2	SS-10	R	Not Driveable	Not Driveable
GZ-2	30	32	SS-11	17	Easy	Easy
GZ-2	35	37	SS-12	9	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-2	40	42	SS-13	16	Easy	Easy
GZ-2	45	47	SS-14	17	Easy	Easy
GZ-3	0	2	SS-1	12	Easy	Easy
GZ-3	2	4	SS-2	20	Easy	Easy
GZ-3	4	6	SS-3	9	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-3	6	8	SS-4	6	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-3	10	11.8	SS-5	0	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-3	15	17	SS-6	17	Easy	Easy
GZ-3	17	19	SS-7	14	Easy	Easy
GZ-3	20	22	SS-8	28	Suitable	Suitable
GZ-3	25	27	SS-9	41	Very Difficult, Consider pre-auger	Suitable consider HYS
GZ-3	30	32	SS-10	28	Suitable	Suitable
GZ-3	35	37	SS-11	16	Easy	Easy
GZ-4 (OW)	0.3	2.3	SS-1	34	Suitable	Suitable
GZ-4 (OW)	2.3	4.3	SS-2	36	Suitable	Suitable
GZ-4 (OW)	5	7	SS-3	81	Very Difficult, pre-auger essential	Suitable require HYS
GZ-4 (OW)	7	9	SS-4	51	Very Difficult, pre-auger essential	Suitable require HYS
GZ-4 (OW)	10	12	SS-5	8	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-4 (OW)	12	14	SS-6	35	Suitable	Suitable
GZ-4 (OW)	14	16	SS-7	5	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-4 (OW)	17	19	SS-8	19	Easy	Easy
GZ-4 (OW)	20	22	SS-9	17	Easy	Easy
GZ-4 (OW)	25	27	SS-10	18	Easy	Easy
GZ-4 (OW)	30	32	SS-11	22	Suitable	Suitable
GZ-4 (OW)	35	37	SS-12	38	Suitable	Suitable
GZ-4 (OW)	40	42	SS-13	22	Suitable	Suitable
GZ-4 (OW)	63.5	63.5	SS-14	R	Not Driveable	Not Driveable

TABLE 6

SUMMARY OF SPT VALUES

Water Pollution Control Facility Perimeter Flood Wall Improvements

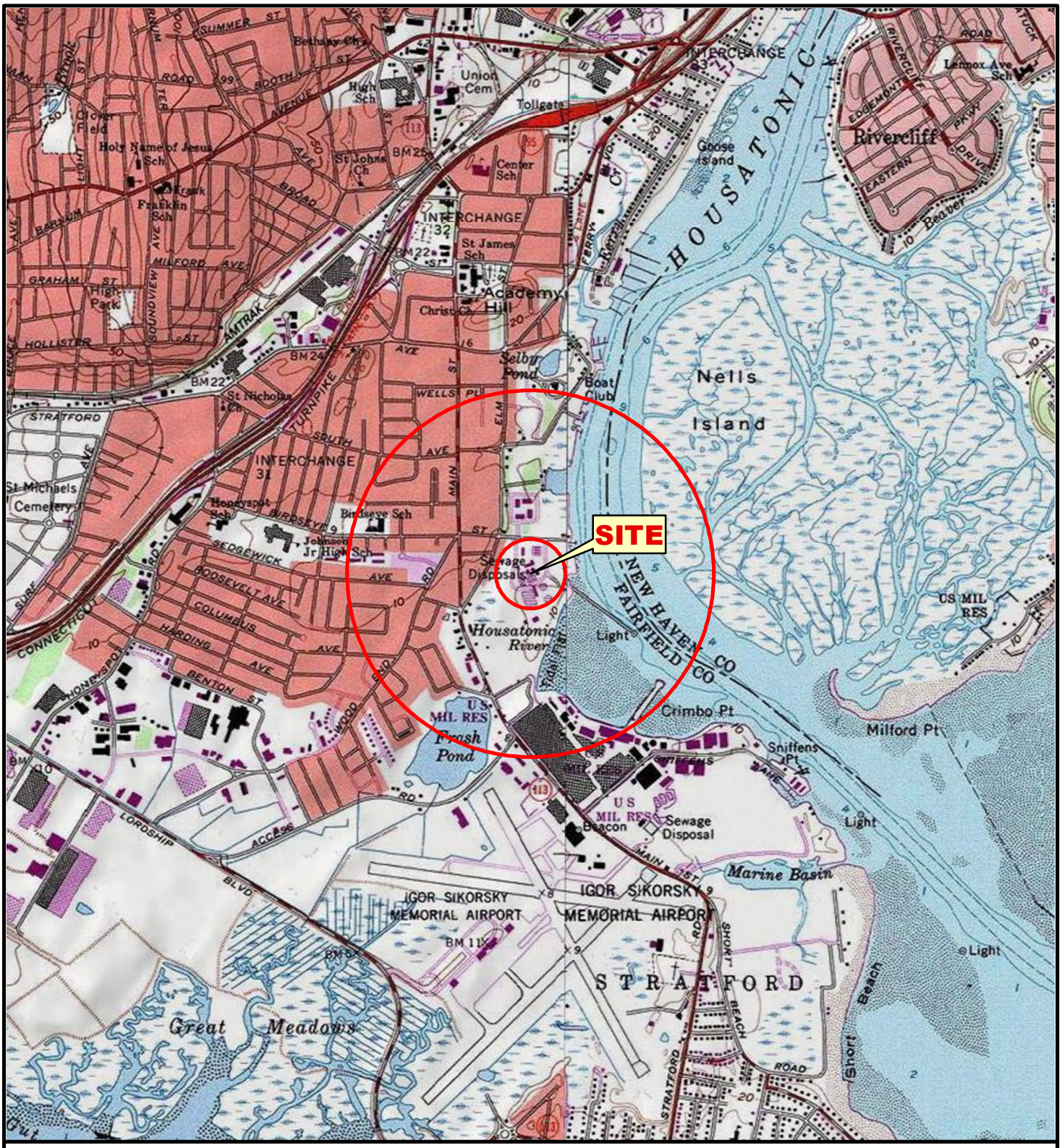
Stratford, Connecticut

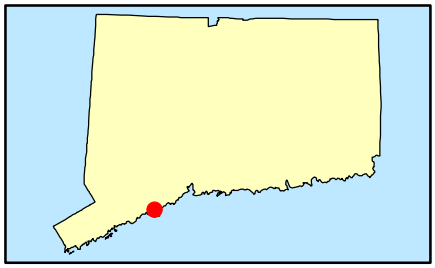
Boring	Top of Sample Depth (ft below grade)	Bottom of Sample Depth (ft below grade)	Sample	SPT Value	Vibro Preliminary Driveability	Impact Preliminary Driveability
GZ-5	0	2	SS-1	23	Suitable	Suitable
GZ-5	2	4	SS-2	30	Suitable	Suitable
GZ-5	4	6	SS-3	7	Very easy	Runaway problem ⇒ use vibro method to grip pile
GZ-5	6	8	SS-4	18	Easy	Easy
GZ-5	10	12	SS-5	35	Suitable	Suitable
GZ-5	15	17	SS-6	33	Suitable	Suitable
GZ-5	20	22	SS-7	16	Easy	Easy
GZ-5	25	27	SS-8	20	Easy	Easy
GZ-5	29.5	29.6	SS-9	R	Not Driveable	Not Driveable
GZ-5	29.6	34.6	C-1	Rock	Not Driveable	Not Driveable

HYS-High Yield Steel

Drivability is based on SPT N value and comparison to the ArcelorMittal Piling Handbook, 9th Edition, revision 2022, Table 11.2 (attached). This is prepared for generally feasibilty and is not for bidding or production estimates.

Figures





SOURCE : USGS TOPOGRAPHIC QUADRANGLES SCANNED BY THE NATIONAL GEOGRAPHIC SOCIETY & I-CUBED, COPYRIGHT 2011

Data Supplied by : esri

0 1,000 2,000 4,000 6,000

SCALE IN FEET

N W E S

GZA

PROJ. MGR.: SB
DESIGNED BY: CGE
REVIEWED BY: CGE
OPERATOR: CGE

DATE: 06-09-2022

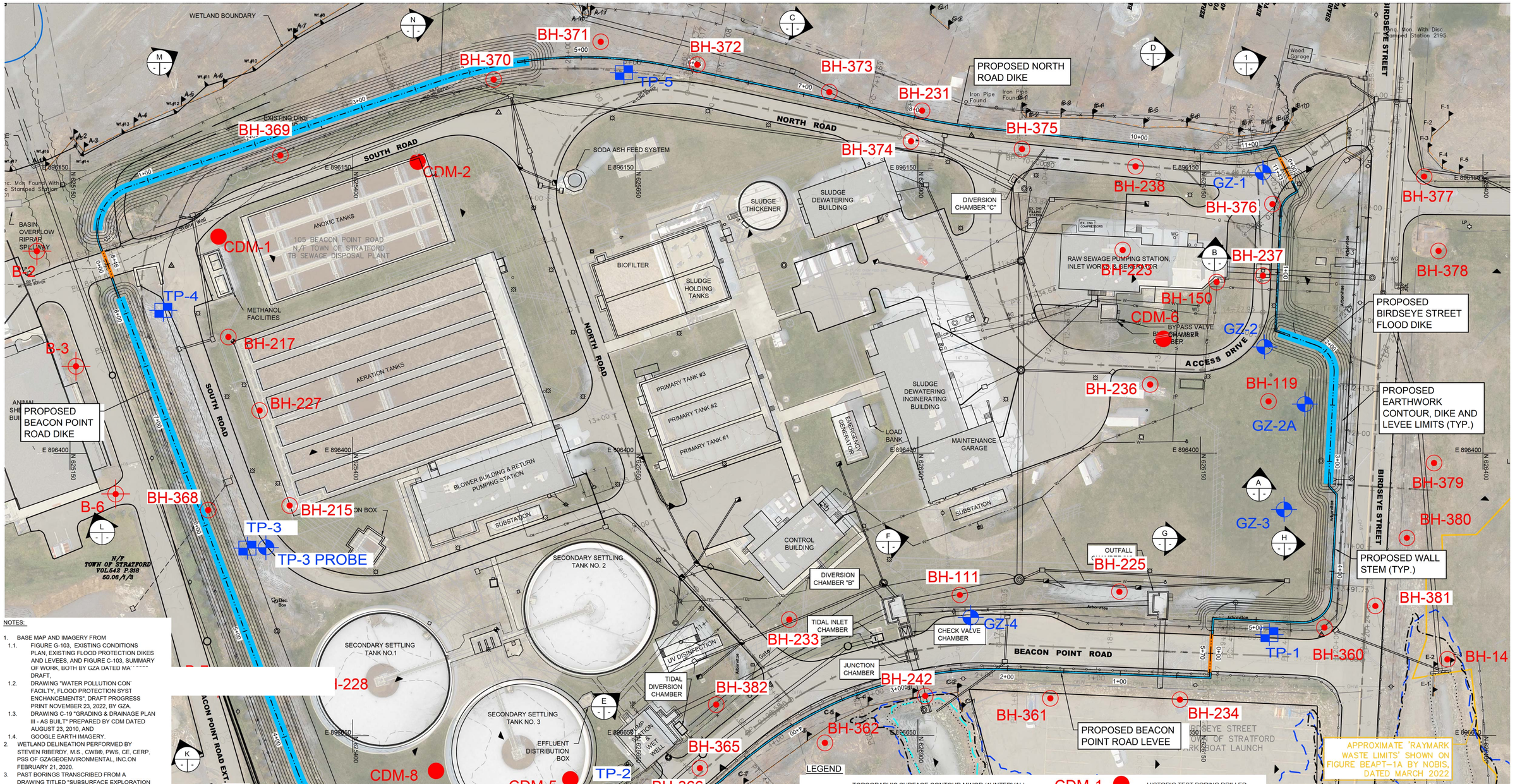
SITE LOCUS PLAN
SHOWING 500 FOOT & 1/2 MILE OFFSETS

JOB NO. 18.0172256.70

STRATFORD WPCF
105 BEACON POINT ROAD
STRATFORD, CT

FIGURE NO. 1

<BOL>© 2022 -<CLR red="1" green="84" blue="131"> GZA GeoEnvironmental, Inc.</CLR></BOL>, \\gzaglast\jobs_46,500-46,999\46950.h50 Jennifer & Greg Ezring\46950-00.dmb\GIS\Site Locus\GIS\MXD\FIG_1_SITE LOCUS PLAN_18_0172256_



NOTES:

1. BASE MAP AND IMAGERY FROM
   - 1.1. FIGURE G-103, EXISTING CONDITIONS PLAN, EXISTING FLOOD PROTECTION DIKES AND LEVEES, AND FIGURE C-103, SUMMARY OF WORK, BOTH BY GZA DATED MA[illegible] DRAFT,
   - 1.2. DRAWING "WATER POLLUTION CON[illegible] FACILTY, FLOOD PROTECTION SYST[illegible] ENCHANCEMENTS", DRAFT PROGRESS PRINT NOVEMBER 23, 2022, BY GZA.
   - 1.3. DRAWING C-19 "GRADING & DRAINAGE PLAN III - AS BUILT" PREPARED BY CDM DATED AUGUST 23, 2010, AND
   - 1.4. GOOGLE EARTH IMAGERY.
2. WETLAND DELINEATION PERFORMED BY STEVEN RIBERDY, M.S., CWB®, PWS, CF, CERP, PSS OF GZAGEOENVIRONMENTAL, INC.ON FEBRUARY 21, 2020.
3. PAST BORINGS TRANSCRIBED FROM A DRAWING TITLED "SUBSURFACE EXPLORATION LOCATION PLAN" FIGURE 2-1 PREPARED BY CDM. ONLY PAST BORINGS ALONG PROPOSED IMPROVEMENTS ARE SHOWN, SEE "GEOTECHNICAL DESIGN REPORT" BY CDM DATED AUGUST 12, 2005 FOR ADDITIONAL PAST BORINGS AND INFORMATION.
4. ADDITIONAL SITE INFORMATION FROM "PROPOSED CONFIRMATION LOCATIONS BEACON POINT & 1 BEACON POINT ROAD RAYMARK SUPERFUND SITE STRATFORD, CONNECTICUT" FIGURE BEAPT-1A BY NOBIS, DATED MARCH 2022 AND "SOIL SAMPLE LOCATIONS, RAYMOARK-OU6, STRATFORD, CONNECTICUT" FIGURE 3-20 BY TETRA TECH NUS, INC. DATED APRIL 27, 2004.
5. THE LOCATION OF THE EXPLORATIONS WERE APPROXIMATELY DETERMINED BY LINE OF SIGHT AND/OR TAPE MEASUREMENTS FROM EXISTING SITE FEATURES. THE LOCATIONS SHOWN SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USE.
6. THE PURPOSE OF THIS DRAWING IS TO LOCATE, DESCRIBE, AND REPRESENT THE POSITIONS OF EXPLORATIONS IN RELATION TO THE SUBJECT SITE. THIS DRAWING IS NOT CONSIDERED A LAND SURVEY.

LEGEND

- TOPOGRAPHIC SURFACE CONTOUR MINOR (1' INTERVAL)
- TOPOGRAPHIC SURFACE CONTOUR MAJOR (5' INTERVAL)
- EXTENT OF EXISTING FLOOD PROTECTION DIKE
- EXTENT OF EXISTING FLOOD PROTECTION LEVEE/ROAD
- EXISTING STORMWATER DRAIN PIPE
- WETLAND BOUNDARY
- PROPERTY BOUNDARY
- COSTAL JURISDICTION LINE (CJL) EL. 5.0' NAVD88
- SPRING HIGH TIDE LINE (SHTL) EL. 3.4' NAVD88
- TP-1 — TEST PIT (AREA 1) EXCAVATED BY CONTE COMPANY ON APRIL 4, 5, AND 7, 2022 AND OBSERVED BY GZA PERSONNEL.
- GZ-2 — TEST BORING (AREA 1) DRILLED BY SOIL TESTING, INC. ON APRIL 4, 5, 8, AND 14, 2022 AND OBSERVED BY GZA PERSONNEL.
- CDM-1 — HISTORIC TEST BORING DRILLED BY GENERAL BORINGS, INC. IN 2004 FOR CDM.
- B-2 — HISTORIC TEST BORING DRILLED BY GENERAL BORINGS, INC. IN 1980 FOR C.E. MAGUIRE, INC.
- BH-14 — HISTORIC TEST BORING DRILLED BY AMERICAN DRILLING & BORING, CO., INC. IN 1967, 1968, 1969, AND 1972 FOR C.E. MAGUIRE & ASSOCIATES, INC.

DRAFT COPY
NOT FOR CONSTRUCTION

0 20 40 80 120
SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

WATER POLLUTION CONTROL FACILITY
PERIMETER FLOOD WALL IMPROVEMENTS
STRATFORD, CONNECTICUT

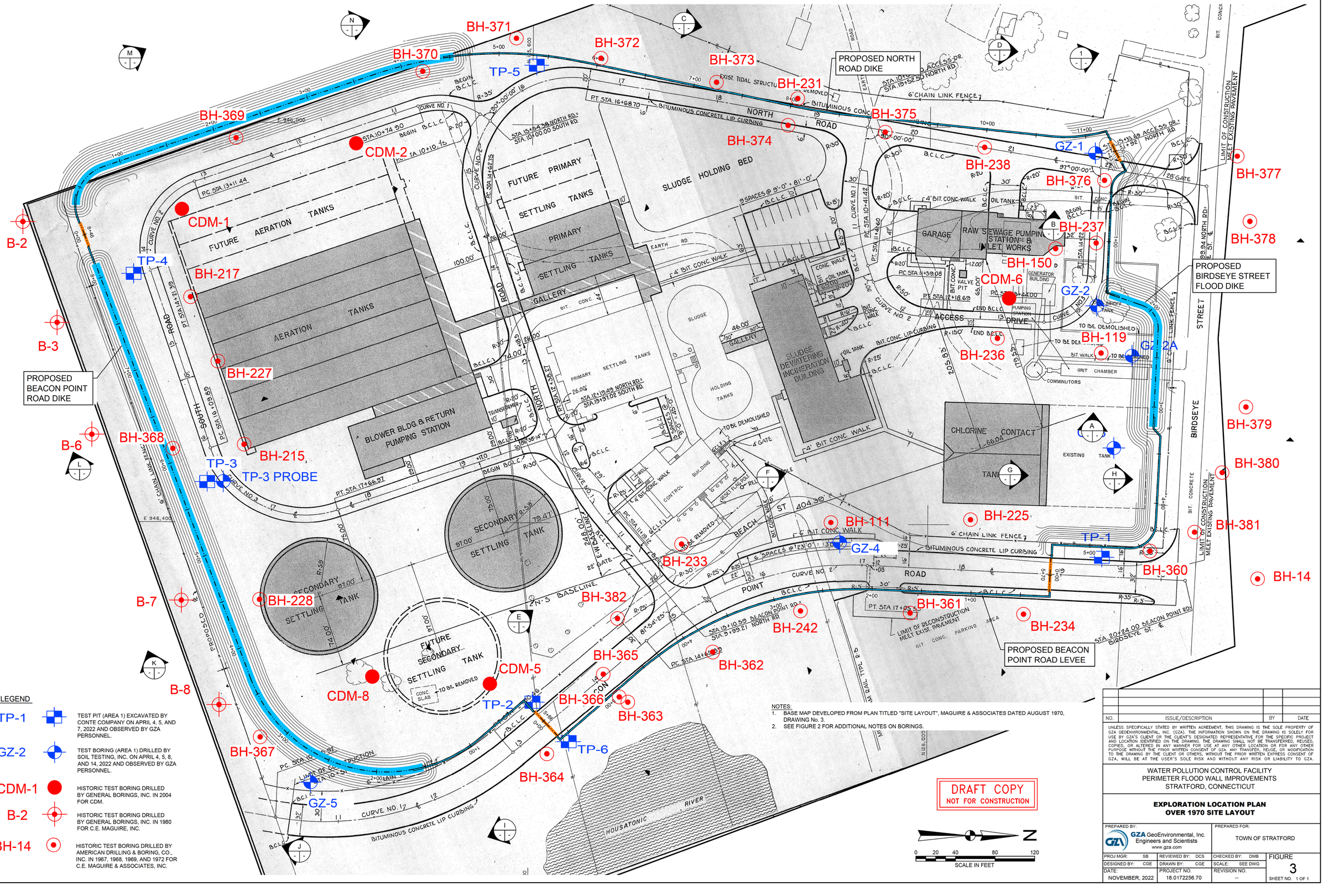
EXPLORATION LOCATION PLAN

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com

PREPARED FOR: TOWN OF STRATFORD

PROJ MGR: SB	REVIEWED BY: DCS	CHECKED BY: DMB	FIGURE 2
DESIGNED BY: CGE	DRAWN BY: CGE	SCALE: SEE DWG	
DATE: NOVEMBER, 2022	PROJECT NO. 18.0172256.70	REVISION NO. --	SHEET NO. 1 OF 1

©2015 - GZA GeoEnvironmental, Inc. G:\ZA\Amesbury\Jobs\172200's\18.0172256.70 Stratford WPCF Perimeter Flood Wall Improvements\Work\Stratford WPCF Perimeter Flood Improvements\x_GZA Reports_Plans_Cost Estimates\Proposed Exploration Location Plan\Boring\01\Boring Plan Drilled-updated pr.dwg [Figure 2 Boring Plan] November 29, 2022 – 10:26am Christopher.Eggers



LEGEND

TP-1	⊞	TEST PIT (AREA 1) EXCAVATED BY CONTE COMPANY ON APRIL 4, 5, AND 7, 2022 AND OBSERVED BY GZA PERSONNEL.
GZ-2	⊕	TEST BORING (AREA 1) DRILLED BY SOIL TESTING, INC. ON APRIL 4, 5, 8, AND 14, 2022 AND OBSERVED BY GZA PERSONNEL.
CDM-1	●	HISTORIC TEST BORING DRILLED BY GENERAL BORINGS, INC. IN 2004 FOR CDM.
B-2	⊕	HISTORIC TEST BORING DRILLED BY GENERAL BORINGS, INC. IN 1980 FOR C.E. MAGUIRE, INC.
BH-14	⊙	HISTORIC TEST BORING DRILLED BY AMERICAN DRILLING & BORING, CO., INC. IN 1967, 1968, 1969, AND 1972 FOR C.E. MAGUIRE & ASSOCIATES, INC.

NOTES:
1. BASE MAP DEVELOPED FROM PLAN TITLED "SITE LAYOUT", MAGUIRE & ASSOCIATES DATED AUGUST 1970, DRAWING No. 3.
2. SEE FIGURE 2 FOR ADDITIONAL NOTES ON BORINGS.

DRAFT COPY
NOT FOR CONSTRUCTION

0 20 40 80 120
SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE

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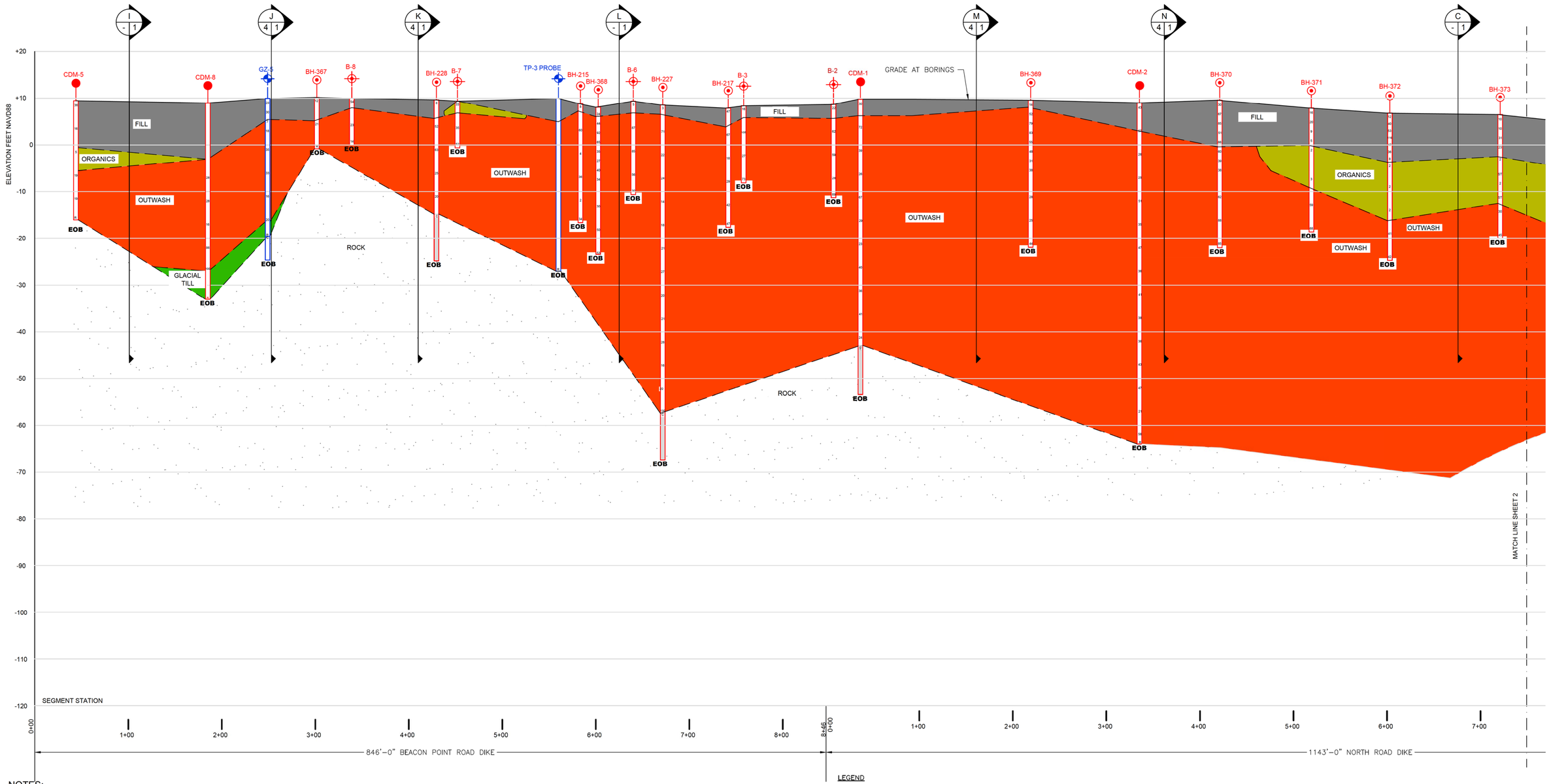
WATER POLLUTION CONTROL FACILITY
PERIMETER FLOOD WALL IMPROVEMENTS
STRATFORD, CONNECTICUT

EXPLORATION LOCATION PLAN OVER 1970 SITE LAYOUT

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: TOWN OF STRATFORD	
PROJ MGR: SB	REVIEWED BY: DCS	CHECKED BY: DMB	FIGURE 3
DESIGNED BY: CGE	DRAWN BY: CGE	SCALE: SEE DWG	
DATE: NOVEMBER, 2022	PROJECT NO. 18.0172256.70	REVISION NO. --	SHEET NO. 1 OF 1

©2015 – GZA GeoEnvironmental, Inc. I:\GZA-C\Users\christopher.eggers\OneDrive – GZA\Documents\Temp – working local\Stratford WPCF\Boring Plan Data\Fig_1970overlay – Standard\Boring Plan Data\Fig_1970overlay_updated pr.dwg [Fig 3 Boring Plan Post 3Bs] November 28, 2022 – 9:35am Christopher.Eggers



NOTES:

1. THE STRATIFICATION LINES ARE BASED ON INTERPOLATIONS BETWEEN WIDELY SPACED TEST BORINGS AND THUS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. ACTUAL TRANSITIONS MAY VARY FROM THOSE SHOWN .
2. STRATIFICATION LINES ARE INTERPOLATED BETWEEN BORINGS AND BASED ON SIMPLIFIED SUMMARY OF THE DATA. SEE BORING LOGS.
3. PAST BORINGS TRANSCRIBED FROM A DRAWING TILTELD "SUBSURFACE EXPLORATION LOCATION PLAN" FIGURE 2-1 PREPARED BY CDM. ONLY PAST BORINGS ALONG PROPOSED IMPROVEMENTS ARE SHOWN, SEE "GEOTECHNICAL DESIGN REPORT" BY CDM DATED AUGUST 12, 2005 FOR ADDITIONAL PAST BORINGS AND INFORMATION.
4. THE LOCATION OF THE GZA 2022 EXPLORATIONS WERE APPROXIMATELY DETERMINED BY LINE OF SIGHT AND/OR TAPE MEASUREMENTS FROM EXISTING SITE FEATURES. THE LOCATIONS SHOWN SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
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LEGEND

- GZ-5 — TEST BORING (AREA 1) DRILLED BY SOIL TESTING, INC. ON APRIL 4, 5, 8, AND 14, 2022 AND OBSERVED BY GZA PERSONNEL.
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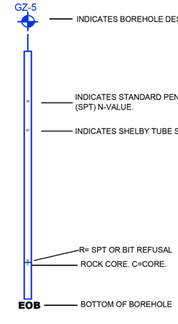
- BH-367 — HISTORIC TEST BORING DRILLED BY AMERICAN DRILLING & BORING, CO., INC. IN 1967, 1968, 1969, AND 1972 FOR C.E. MAGUIRE & ASSOCIATES, INC.

- EXISTING FILL
- OUTWASH DEPOSIT
- GLACIAL TILL
- ORGANIC SILT AND/OR FIBROUS PEAT
- BEDROCK



VERTICAL SCALE IN FEET
0 5 10 20
0 25 50 100
HORIZONTAL SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE

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WATER POLLUTION CONTROL FACILITY
FLOOD PROTECTION SYSTEM ENHANCEMENTS
STRATFORD, CONNECTICUT

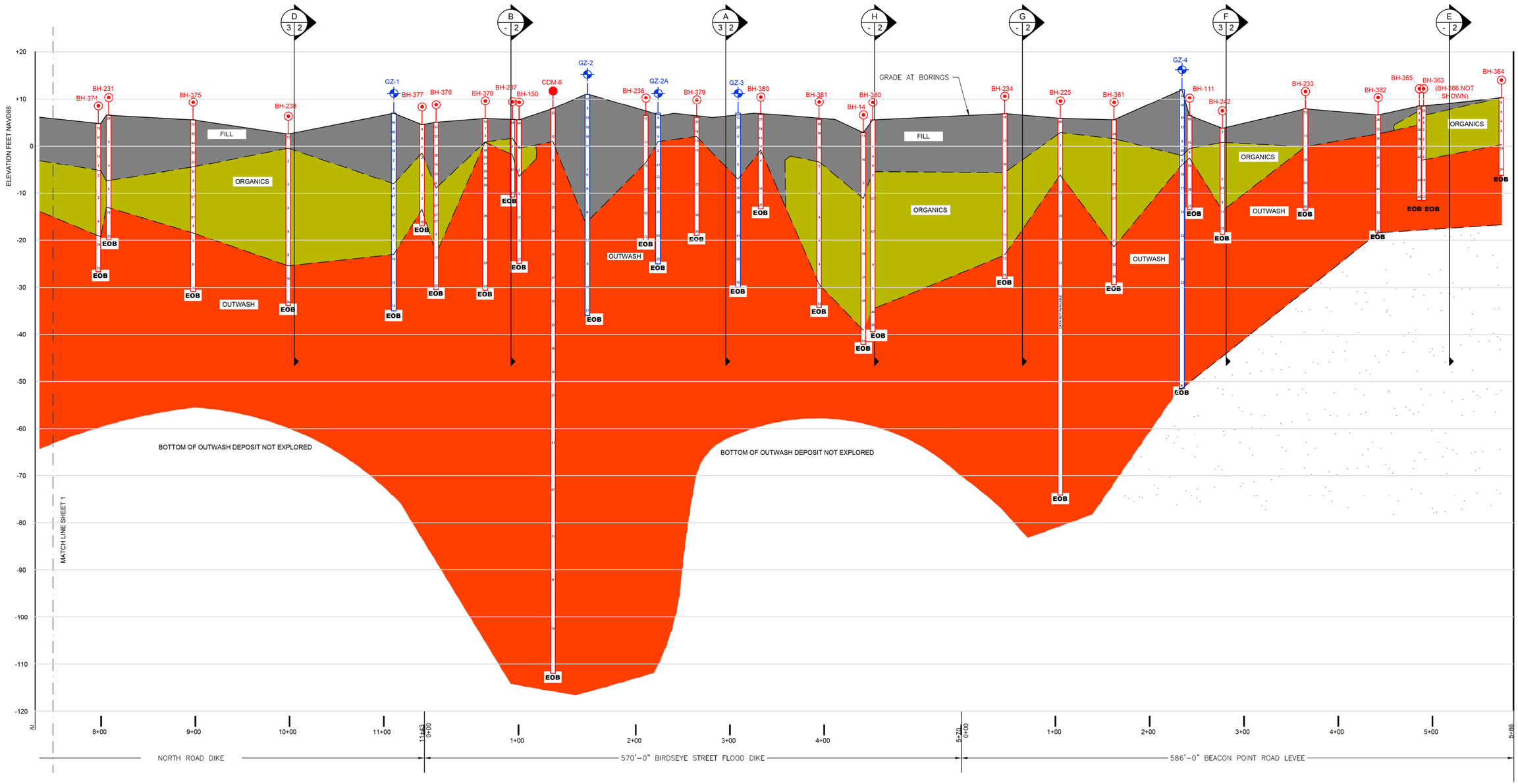
EXPLORATION PROFILE (1 OF 4)

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
TOWN OF STRATFORD

PROJ MGR: SB	REVIEWED BY: DMB	CHECKED BY: SB	FIGURE 4
DESIGNED BY: CGE	DRAWN BY: CGE	SCALE: 1"=50'	
DATE: NOVEMBER, 2022	PROJECT NO. 18.0172256.70	REVISION NO. 0	SHEET NO. 1 OF 4

©2018 – GZA GeoEnvironmental, Inc. GZA-C:\Users\christopher.eggers\Vaporbrs\Local\Temp\AcPublish_43864\Stratford Profile 2022-07-01s.dwg [profile sheet 1] November 23, 2022 – 3:15pm Christopher.Eggers



NOTES:

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LEGEND

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- EXISTING FILL
- OUTWASH DEPOSIT
- GLACIAL TILL
- ORGANIC SILT AND/OR FIBROUS PEAT
- BEDROCK

GZ-5 — INDICATES BOREHOLE DESIGNATION

INDICATES STANDARD PENETRATION TEST (SPT) N-VALUE.

INDICATES SHELBY TUBE SAMPLE LOCATION.

R= SPT OR BIT REFUSAL
ROCK CORE. C=CORE.

EOB — BOTTOM OF BOREHOLE

VERTICAL SCALE IN FEET
0 5 10 20
HORIZONTAL SCALE IN FEET
0 25 50 100

NO.	ISSUE/DESCRIPTION	BY	DATE

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WATER POLLUTION CONTROL FACILITY
PERIMETER FLOOD WALL IMPROVEMENTS
STRATFORD, CONNECTICUT

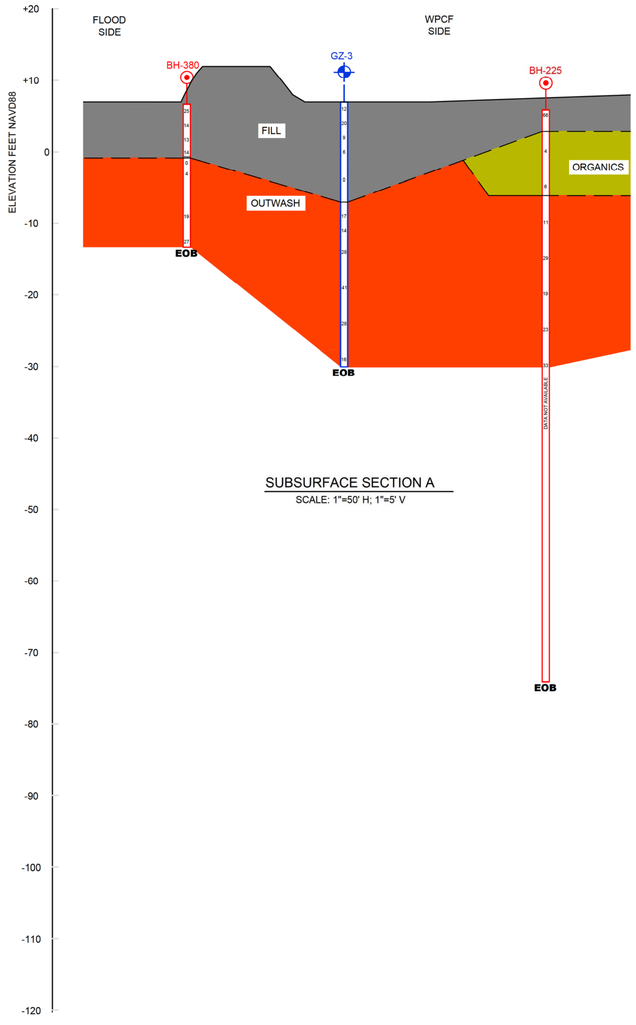
EXPLORATION PROFILE (2 OF 4)

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
TOWN OF STRATFORD

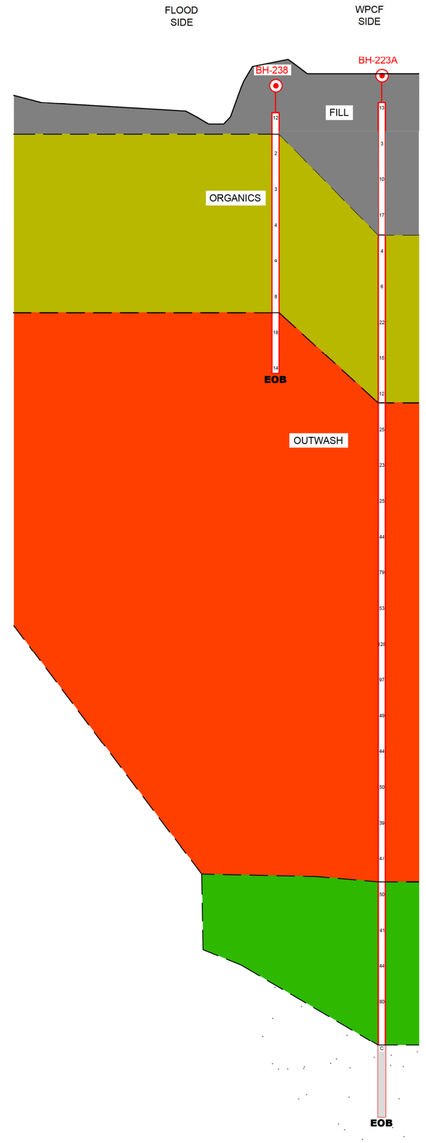
PROJ MGR: SB	REVIEWED BY: DMB	CHECKED BY: SB	FIGURE 4
DESIGNED BY: JFD	DRAWN BY: JFD	SCALE: 1"=50'	
DATE: NOVEMBER, 2022	PROJECT NO. 18.0172256.70	REVISION NO. 0	SHEET NO. 2 OF 4

©2018 – GZA GeoEnvironmental, Inc. G:\ZA-C:\Users\jfehlstepher.egpen\Vaptext\Local\Temp\AcPublish_43664\Stratford Profile 2022-07-01c.dwg [profile sheet 2] November 23, 2022 – 3:15pm Christopher Eggers



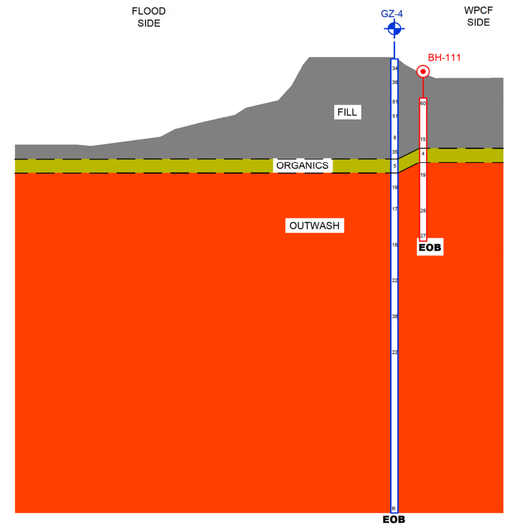
SUBSURFACE SECTION A

SCALE: 1"=50' H; 1"=5' V



SUBSURFACE SECTION D

SCALE: 1"=50' H; 1"=5' V



SUBSURFACE SECTION F

SCALE: 1"=50' H; 1"=5' V

NOTES:

1. THE STRATIFICATION LINES ARE BASED ON INTERPOLATIONS BETWEEN WIDELY SPACED TEST BORINGS AND THUS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES. ACTUAL TRANSITIONS MAY VARY FROM THOSE SHOWN .
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6. SEE DRAFT EXISTING SITE PLAN DRAWINGS FOR SECTIONS NOT SHOWN AND EXISTING ADDITIONAL INFORMATION.

LEGEND

- GZ-5 — TEST BORING (AREA 1) DRILLED BY SOIL TESTING, INC. ON APRIL 4, 5, 8, AND 14, 2022 AND OBSERVED BY GZA PERSONNEL.
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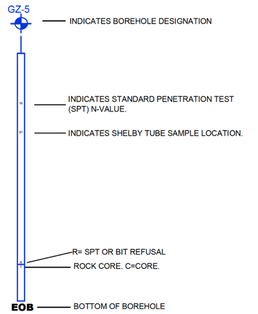
- EXISTING FILL
- OUTWASH DEPOSIT
- GLACIAL TILL
- ORGANIC SILT AND/OR FIBROUS PEAT
- BEDROCK



VERTICAL SCALE IN FEET
0 5 10 20
0 25 50 100
HORIZONTAL SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE

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WATER POLLUTION CONTROL FACILITY
PERIMETER FLOOD WALL IMPROVEMENTS
STRATFORD, CONNECTICUT

EXPLORATION PROFILE (3 OF 4)

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: TOWN OF STRATFORD	
PROJ MGR: SB	REVIEWED BY:	CHECKED BY:	FIGURE 4
DESIGNED BY:	DRAWN BY:	SCALE: 1"=50'H:1"=5'V	
DATE: NOVEMBER, 2022	PROJECT NO. 18.0172256.70	REVISION NO. 0	SHEET NO. 3 OF 4

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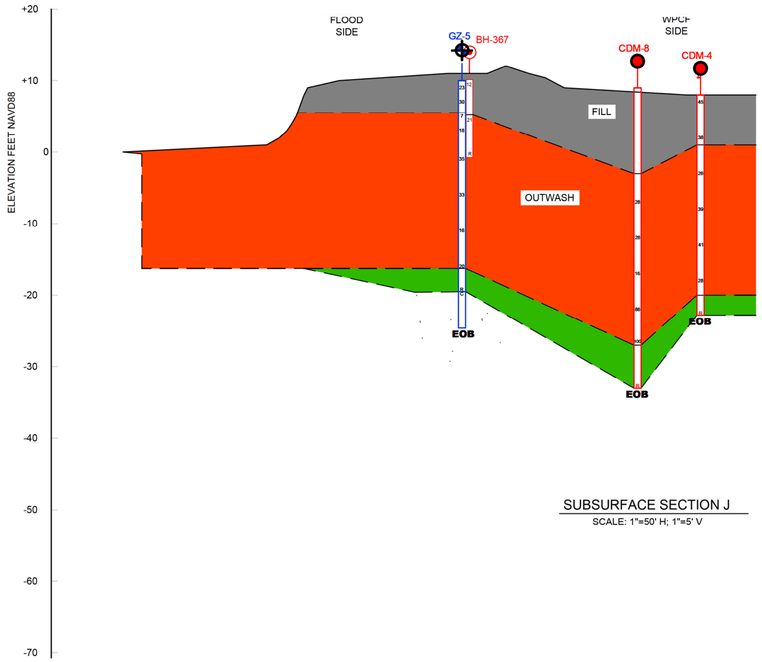
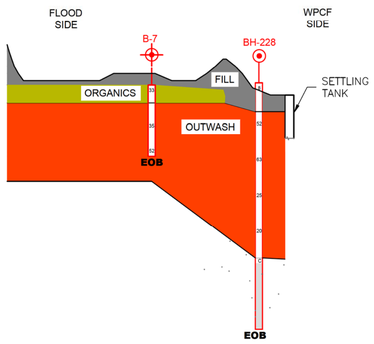


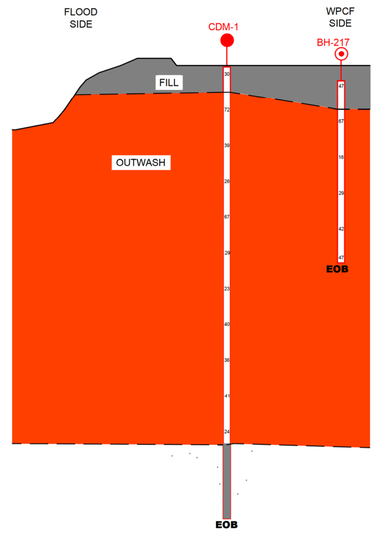
SUBSURFACE SECTION J

SCALE: 1"=50' H; 1"=5' V



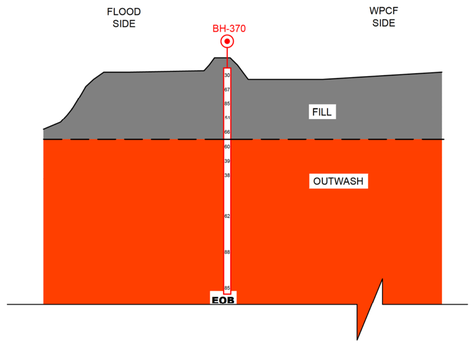
SUBSURFACE SECTION K

SCALE: 1"=50' H; 1"=5' V



SUBSURFACE SECTION M

SCALE: 1"=50' H; 1"=5' V



SUBSURFACE SECTION N

SCALE: 1"=50' H; 1"=5' V

NOTES:

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LEGEND

GZ-5 — TEST BORING (AREA 1) DRILLED BY SOIL TESTING, INC. ON APRIL 4, 5, 8, AND 14, 2022 AND OBSERVED BY GZA PERSONNEL.

CDM-8 — HISTORIC TEST BORING DRILLED BY GENERAL BORINGS, INC. IN 2004 FOR CDM.

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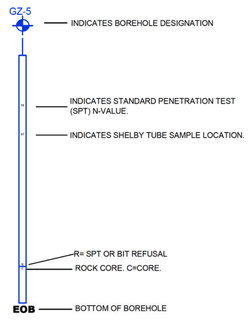
EXISTING FILL

OUTWASH DEPOSIT

GLACIAL TILL

ORGANIC SILT AND/OR FIBROUS PEAT

BEDROCK



VERTICAL SCALE IN FEET
0 5 10 20
0 25 50 100
HORIZONTAL SCALE IN FEET

NO.	ISSUE/DESCRIPTION	BY	DATE

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WATER POLLUTION CONTROL FACILITY
PERIMETER FLOOD WALL IMPROVEMENTS
STRATFORD, CONNECTICUT

EXPLORATION PROFILE (3 OF 4)

PREPARED BY:		PREPARED FOR:	
GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		TOWN OF STRATFORD	
PROJ MGR: SB	REVIEWED BY:	CHECKED BY:	FIGURE 4
DESIGNED BY:	DRAWN BY:	SCALE: 1"=50'H:1"=5'V	
DATE: NOVEMBER, 2022	PROJECT NO. 18.0172256.70	REVISION NO. 0	SHEET NO. 3 OF 4

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Appendix A – Limitations

USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the contract documents, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in Proposal for Services and/or Report, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. If conditions other than those described in this report are found at the subject location(s), or the design has been altered in any way, GZA shall be so notified and afforded the opportunity to revise the report,as appropriate, to reflect the unanticipated changed conditions .

3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, express or implied, is made.

4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

SUBSURFACE CONDITIONS

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

6. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein which were made available to GZA at the time of our evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

7. Water level readings have been made in test holes (as described in this Report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The water table encountered in the course of the work may differ from that indicated in the Report.

8. GZA's services did not include an assessment of the presence of oil or hazardous materials at the property. Consequently, we did not consider the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use of structures on the property.

9. Recommendations for foundation drainage, waterproofing, and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations may not preclude an environment that allows the infestation of mold or other biological pollutants.

COMPLIANCE WITH CODES AND REGULATIONS

10. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

COST ESTIMATES

11. Unless otherwise stated, our cost estimates are only for comparative and general planning purposes. These estimates may involve approximate quantity evaluations. Note that these quantity estimates are not intended to be sufficiently accurate to develop construction bids, or to predict the actual cost of work addressed in this Report. Further, since we have no control over either when the work will take place or the labor and material costs required to plan and execute the anticipated work, our cost estimates were made by relying on our experience, the experience of others, and other sources of readily available information. Actual costs may vary over time and could be significantly more, or less, than stated in the Report.

ADDITIONAL SERVICES

12. GZA recommends that we be retained to provide services during any future: site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

Appendix B – Test Boring Logs

LOG KEY

GZA
Geo Environmental, Inc.
Engineers and Scientists

BURMISTER SOIL CLASSIFICATION

COMPONENT	NAME	PROPORTIONAL PERCENT BY TERM	WEIGHT
MAJOR	GRAVEL, SAND, FINES*		>50
Minor	Gravel, Sand, Fines*	and	35-50
		some	20-35
		little	10-20
*See identification of fines table.		trace	0-10

IDENTIFICATION OF FINES		
Material	**PI**	**Atterberg Thread Dia.**
SILT	0	Cannot Roll
Clayey SILT	1-5	1/4"
SILT & CLAY	5-10	1/8"
CLAY & SILT	10-20	1/16"
Silty CLAY	20-40	1/32"
CLAY	>40	1/64"

Sieve Size	Description
Passing #200	Silts & Clays
#200 - #40	Fine Sand
#40 - #10	Medium Sand
#10 - #4	Coarse Sand
#4 – ¾"	Fine Gravel
¾" – 3"	Coarse Gravel
3" – 6"	Cobbles
>6"	Boulders

GRADATION DESIGNATION	PROPORTION OF COMPONENT
Fine to coarse	All fractions > 10%
Medium to coarse	<10% fine
Fine to medium	<10% coarse
Coarse	<10% fine and medium
Medium	<10% coarse and fine
Fine	<10% coarse and medium

PLASTIC SOILS		
Consistency	**Blows/Ft. SPT N-Value**	
Very Soft	< 2	
Soft	2 - 4	
Medium Stiff	4 - 8	
Stiff	8 - 15	
Very Stiff	15 - 30	
Hard	>30	

GRAVEL & SAND	
Density	**Blows/Ft. SPT N-Value**
Very Loose	< 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) (ASTM D 2487)

MAJOR DIVISIONS			Group Symbols
Coarse Grained Soils	Gravel	Clean Gravels	GW
More than 50% of material	More than 50%	(Little or no fines	GP
larger than No. 200 sieve.	larger than No. 4 sieve.		
Gravels with Fines			GM
(Appreciable amount of fines)			GC
Sand		Clean Sands	SW
	More than 50%	(Little or no fines)	SP
	smaller than No. 4 sieve.		
Sands with Fines			SM
(Appreciable amount of fines)			SC
			ML
		Silts and Clays Liquid Limit <50	
Fine Grained Soils			CL
More than 50% of material			
smaller than No. 200 sieve.			OL
			MH
Silts and CLays Liquid Limit >50			CH
			OH
Highly Organic Soils			Pt

ORGANIC SOIL CLASSIFICATION

Fibrous PEAT (Pt) - Lightweight, spongy, mostly visible organic matter, water squeezes readily from sample. Typically near top of deposit.
Fine Grained PEAT (Pt) - Lightweight, spongy, little visible organic matter, water squeezes readily from sample. Typically below fibrous peat.
Organic Silt (OL) - Typically gray to dark gray, often has strong H2S odor. Typically contains shells or shell fragments. Lightweight. Usually found near coastal regions. May contain wide range of sand fractions.
Organic Clay (OH) - Typically gray to dark gray, high plasticity. Usually found near coastal regions. May contain wide range of sand fractions. Need organic content test for final identification.

ABBREVIATIONS

MR = Mud Rotary
HSA = Hollow Stem Auger
SSA = Solid Stem Auger
SS = Split Spoon Sampler
U = Undisturbed Sample (Shelby Tube)
MC = Modified California Sampler
V = Vibracore
M = Macrocore

USCS = Unified Soil Classification System (ASTM D2487)
NYCBC = New York City Building Code
WOR = Weight of Rods
WOH= Weight of Hammer
SPT = Standard Penetration Test (ASTM D1586)

Tv = Field Vane Shear Test (Torvane) Shear Strength
PP = Pocket Penetrometer Shear Strength
PI = Plasticity Index
Wn = Moisture Content
CO = Consolidation
UC = Unconfined Compression Test
UU = Unconsolidated Undrained (Triaxial) Test
SI = Sieve Analysis
DS = Direct Shear
PID = Photoionization Detector
ppm = Parts Per Million
REC = Recovery
RQD = Rock Quality Designation
= Measured Water Level

N-Value = Cumulative number of uncorrected blows for the middle two six-inch intervals (blows/foot).

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-1 (OW)
SHEET: 1 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 7
Final Boring Depth (ft.): 42
Date Start - Finish: 4/4/2022 - 4/4/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4-1/4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/4/2022	1245	4.5	2 hrs
4/5/2022	0715	4.25	21 hrs

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows per 6"	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data
		SS-1	1-3	24	16	24 72 22 100	94	SS-1 : Top 2": Grey, fine to coarse SAND and GRAVEL, little Silt Bottom 14": Brown, fine to coarse SAND, some Gravel, little Silt	1	ND
									2	ND
		SS-2	3-5	24	15	18 46 44 33	90		3	ND
5										ND
		SS-3	5-7	24	15	10 19 16 6	35	SS-2 : Very dense, dark brown, brown, fine to medium SAND, some Gravel, little Silt	4	ND
		SS-4	7-9	24	22	4 9 7 6	16	SS-3 : Dense, grey, black, fine to coarse SAND, some Gravel, some Silt (moist)		ND
10		SS-5	9-11	24	5	3 1 1 3	2	SS-4 : Medium dense, black, fine to coarse SAND and SILT, little Gravel, trace Shell (wet)	5	0.2
		SS-6	11-13	24	13	4 5 6 8	11	SS-5 : Loose, black, fine to coarse SAND and SILT, some Gravel, trace Shell, trace Wood, trace Glass		0.1
15		SS-7	15-17	24	10	5 2 2 3	4	SS-6 : Medium dense, grey, black, fine to coarse SAND, some Silt, some Gravel		ND
										ND
		ST-1	17-19	30	24	PUSH		SS-7 : Loose, grey, black, SILT, trace fine SAND, trace Shell, trace Fibrous Peat	6	0.4
										0.4
		SS-8	19-21	24	0	2 2 3 3	5	ST-1 : Very dark, grey SILT SS-8 : No Recovery		ND
20		ST-2	21-23	30	17	PUSH		ST-2 : Dark grey, Sandy SILT		ND
		SS-9	23-25	24	11	2 2 4 3	6	SS-9 : Medium stiff, dark brown, Fibrous PEAT, some Silt		0.3
										0.3
25		SS-10	25-27	24	24	3 3 4 6	7	SS-10 : Medium stiff, dark brown, fine grained PEAT, some Silt, trace fine Sand		0.3
										0.4
30										

Stratum Description: ASPHALT (0.3 / 6.7); FILL; ORGANIC SILT (15 / -8.0); FIBROUS PEAT (23 / -16.0); (30 / -23.0)

Roadway Box

Drill Spoils (2'-16')

2" PVC Riser (0-32')

Bentonite (16'-18')

REMARKS

1 - Soil samples screened with a 10.6 eV MiniRAE photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. A "*" indicates a sample sent to a laboratory for additional analyses or screening. ND=None Detected above background.
2 - Monitoring well installed at 42 feet. 10 feet of 2" PVC well screen set at approximately 42 feet below grade. Well completed to ground surface with 32 feet of a 2", Schedule 40 threaded, flush joint, PVC riser. Filter sand place in annulus around well from 18 feet to 42 feet. Bentonite seal from 16 feet to 18 feet below grade. Auger spoils (or filter sand) from 2 feet to 16 feet below grade. Well capped at ground surface with curb box and concrete.
3 - Hollow stem augers (HSA) methods from ground surface to 42 feet below ground surface.
4 - Spoon observed to be wet on the outside at approximately 5 feet below ground surface.
5 - Driller filled augers with water to prevent caving soil at 11 feet below ground surface.
6 - ST - indicates undisturbed tube sample collection attempted.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: GZ-1 (OW)

TEST BORING LOG GZA W/EQUIP_REMB CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:28:09 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-1 (OW)
SHEET: 2 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 7
Final Boring Depth (ft.): 42
Date Start - Finish: 4/4/2022 - 4/4/2022

H. Datum: See Plan
V. Datum: NAVD88

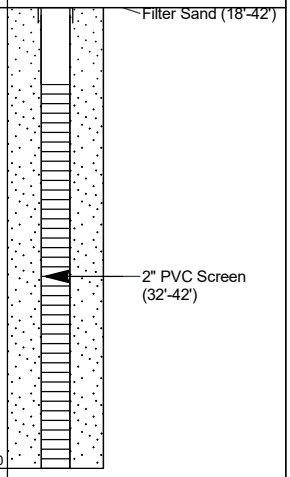
Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4-1/4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/4/2022	1245	4.5	2 hrs
4/5/2022	0715	4.25	21 hrs

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows per 6"	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
		SS-11	30-32	24	15	5 8 11 13	19	SS-11 : Medium dense, grey, fine to medium SAND, little Silt		ND ND			
35		SS-12	35-37	24	14	4 5 7 9	12	SS-12 : Medium dense, grey, fine to medium SAND, little Silt, trace Gravel		ND ND		OUTWASH DEPOSITS	
40		SS-13	40-42	24	16	5 6 7 7	13	SS-13 : Medium dense, grey, fine SAND, little Silt, trace Gravel		ND ND	42		-35.0
								End of exploration at 42 feet.	7 8				
45													
50													
55													
60													



REMARKS

7 - Well removed and hole backfilled with cement on 4/14/22.
8 - Ground surface elevation was interpolated from the topographic plan.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: GZ-1 (OW)

TEST BORING LOG GZA W/EQUIP_REM6 CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:28:09 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-2
SHEET: 1 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 11
Final Boring Depth (ft.): 47
Date Start - Finish: 4/4/2022 - 4/5/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4-1/4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Core Barrel Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/5/2022	0930	10.6	30 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Depth (ft.)	STRATUM Description	Elev. (ft.)
		SS-1	0-2	24	13	2 4 6 6	10	SS-1 : Loose, brown, dark brown, fine to medium SAND, some Silt, little Gravel, trace Roots	1 2 3	ND	0.5	TOPSOIL	10.5
		SS-2	2-4	24	15	3 3 3 3	6	SS-2 : Loose, brown, dark brown, fine to medium SAND, some Silt, trace Gravel, trace Roots		ND ND			
5		SS-3	4-6	24	13	6 12 21 17	33	SS-3 : Dense, light brown, brown, fine to medium SAND, some Gravel, little Silt		ND ND			
		SS-4	6-8	24	4	15 9 9 7	18	SS-4 : Medium dense, brown, fine to medium SAND, some Gravel, little Silt		ND ND			
		SS-5	8-10	24	15	3 6 10 10	16	SS-5 : Medium dense, grey, fine to medium SAND, some Silt, trace Gravel (Wet)		ND ND		FILL	
10		SS-6	10-12	24	24	8 8 8 4	16	SS-6 : Medium dense, grey, fine SAND, some Silt, trace Gravel (wet)		ND ND ND			
15		SS-7	15-17	24	12	3 0 1 13	1	SS-7 : Very loose, grey, fine to medium SAND, little Silt, trace Gravel		ND ND			
		SS-8	17-17.2	2	2	100/2"		SS-8 : Crushed Concrete in spoon tip	4	0.6	17		-6.0
20		SS-9	20-20.2	2	2	100/2"		SS-9 : Crushed Concrete in spoon tip		ND ND		CONCRETE	
25		SS-10	25-25.2	2	2	100/2"		SS-10 : Crushed Concrete in spoon tip		ND	27		-16.0
									5			OUTWASH DEPOSITS	
30													

REMARKS

1 - Soil samples screened with a 10.6 eV MiniRAE photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. A "*" indicates a sample sent to a laboratory for additional analyses or screening. ND=None Detected above background.
2 - Hollow stem augers (HSA) methods used from 0 to 47 feet below ground surface.
3 - Environmental composite sample taken 0 to 8 feet.
4 - Concrete in spoon tip. Driller indicated increased drilling resistance and difficult drilling from 17 to 27 feet below grade.
5 - Driller indicated less auger resistance and faster penetration at 27 feet below ground surface.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual.

Exploration No.: GZ-2

GZA TEMPLATE 0210.GDT GZA TEMPLATE TEST BORING REM6_CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:29:16 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-2
SHEET: 2 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 11
Final Boring Depth (ft.): 47
Date Start - Finish: 4/4/2022 - 4/5/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4-1/4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Core Barrel Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/5/2022	0930	10.6	30 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Depth (ft.)	STRATUM Description	Elev. (ft.)
		SS-11	30-32	24	15	23 11 6 7	17	SS-11 : Top 6": Black, fine to coarse SAND and GRAVEL, little Silt Bottom 9": Grey, brown, fine SAND, little Silt, trace Gravel		ND ND			
35		SS-12	35-37	24	3	3 4 5 6	9	SS-12 : Loose, grey, brown, fine to medium SAND, little Silt, trace fine Gravel		ND			
									6			OUTWASH DEPOSITS	
40		SS-13	40-42	24	17	4 7 9 15	16	SS-13 : Medium dense, grey, brown, fine to medium SAND, little Silt, trace fine Gravel		ND ND			
45		SS-14	45-47	24		5 6 11 14	17	SS-14 : Medium dense, brown, grey, fine to coarse SAND, some fine Gravel, little Silt		ND ND			
									7		47		-36.0
								End of exploration at 47 feet below grade.	8 9				
50													
55													
60													

REMARKS

6 - At 38 feet, driller indcated auger resistance.
7 - Falling head hydraulic conductivity testing performed at 47 feet below grade.
8 - Borehole backfilled with drill spoils and cement.
9 - Ground surface elevation was interpolated from the topographic plan.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual.

Exploration No.: GZ-2

GZA TEMPLATE 0210.GDT GZA TEMPLATE TEST BORING REM6_CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:29:16 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-2A
SHEET: 1 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: Rotary Wash

Boring Location: See Plan
Ground Surface Elev. (ft.): 7
Final Boring Depth (ft.): 32
Date Start - Finish: 4/14/2022 - 4/14/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Core Barrel Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/14/2022	1130	7.5	30 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Depth (ft.)	STRATUM Description	Elev. (ft.)
		SS-1	0-2	24	15	2 2 2 2	4	SS-1 : Loose, dark brown, fine to medium SAND, some Silt, little Gravel, trace Roots, trace Grass	1 2	ND ND		TOPSOIL	
		SS-2	2-4	24	10	3 6 80 18	86	SS-2 : Very dense, dark brown, fine to medium SAND, some Silt, some Gravel		ND	2		5.0
5		SS-3	4-6	24	7	7 6 3 3	9	SS-3 : Loose, brown, fine to coarse SAND, some Gravel, some Silt (Moist)	3	ND		FILL	
		SS-4	6-10	24	18	2 1 1 2	2	SS-4 : Very loose, brown, black, fine to coarse SAND, little Gravel, little Silt (Wet)	4	ND ND	6		1.0
	30									ND			
	30									ND			
10	30	SS-5	10-12	24	8	12 12 9 10	21	SS-5 : Medium dense, fine to coarse SAND and GRAVEL, little Silt (Wet)		ND ND			
	35	SS-6	12-15	24	13	8 10 12 10	22	SS-6 : Medium dense, fine to coarse SAND, some Gravel, trace Silt (Wet)		ND			
	35								5				
15	24	SS-7	15-17	24	0.5	9 7 8 8	15	SS-7 : Medium dense, fine to coarse SAND, trace Silt (Wet)		ND			
	24											OUTWASH DEPOSITS	
	38												
	42												
	46												
20	55	SS-8	20-22	24	11	9 12 13 23	25	SS-8 : Top 5": Brown, fine to coarse SAND and GRAVEL, trace Silt Bottom 6": Brown, tan, fine SAND, little Silt		ND ND			
	55												
	60												
	60												
25	70	SS-9	25-27	24	15	26 31 32 28	63	SS-9 : Very dense, brown, tan, fine to medium SAND and SILT		ND			
	80												
	80												
	80												
30	80												

REMARKS

1 - Soil samples screened with a 10.6 eV MiniRAE photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. A "*" indicates a sample sent to a laboratory for addit
2 - Hollow stem augers (HSA) methods used from 0 to 8 feet below ground surface, cased rotary wash from 8 feet to 32. Casing driven with a 300-lb. hammer.
3 - Auger chatter at 3 feet below ground surface.
4 - Outside of SS-4 spoon was wet, suspected groundwater table at approximately 7 feet below ground surface.
5 - Falling head hydraulic conductivity testing performed at 14 feet and 32 feet below ground surface.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual.

Exploration No.: GZ-2A

GZA TEMPLATE 0210.GDT GZA TEMPLATE TEST BORING REM6_CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:29:17 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-2A
SHEET: 2 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: Rotary Wash

Boring Location: See Plan
Ground Surface Elev. (ft.): 7
Final Boring Depth (ft.): 32
Date Start - Finish: 4/14/2022 - 4/14/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Core Barrel Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/14/2022	1130	7.5	30 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Depth (ft.)	STRATUM Description	Elev. (ft.)
		SS-10	30-32	24	21	4 8 17 30	25	SS-10 : Medium dense, brown, tan, fine to medium SAND, little Silt		ND ND		OUTWASH DEPOSITS	
											32		-25.0
								End of exploration at 32 feet below grade.	6				

REMARKS

6 - Ground surface elevation was interpolated from the topographic plan.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual.

Exploration No.: GZ-2A

GZA TEMPLATE 0210.GDT GZA TEMPLATE TEST BORING REM6_CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:29:17 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-3
SHEET: 1 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: Rotary Wash

Boring Location: See Plan
Ground Surface Elev. (ft.): 7
Final Boring Depth (ft.): 37
Date Start - Finish: 4/5/2022 - 4/5/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Core Barrel Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/5/2022	1310	10.8	15 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Depth (ft.)	STRATUM Description	Elev. (ft.)
		SS-1	0-2	24	10	1 2 10 17	12	SS-1 : Top 5": Dark brown, fine to medium SAND and SILT, little Gravel, little Roots, little Grass Bottom 5": Dark brown, brown, fine to medium SAND, some Silt, some Gravel, trace Roots	1 2	ND ND	0.4	TOPSOIL	6.6
		SS-2	2-4	24	11	13 12 8 6	20	SS-2 : Medium dense, brown, fine to medium SAND, some Silt, some Gravel		ND			
5		SS-3	4-6	24	4	3 4 5 4	9	SS-3 : Loose, dark brown, brown, fine to coarse SAND, some Silt, some Gravel (moist)		ND ND			
		SS-4	6-8	20	6	3 4 2 3	6	SS-4 : Loose, dark brown, brown, fine to coarse SAND, some Silt, little Gravel (moist)	3	ND		FILL	
10		SS-5	10-11.8	24	20	1 0 0 100/2"	0	SS-5 : Very loose, black SILT, trace fine to medium SAND, trace Gravel, trace Shell, trace Roots (petroleum odor)	4	ND ND	11.8	POSSIBLE CONCRETE	-4.8
15		SS-6	15-17	24	14	10 9 8 8	17	SS-6 : Medium dense, dark grey, grey, fine to coarse SAND, some Gravel, little Silt		6.1 4.8	14		-7.0
		SS-7	17-19	24	17	6 6 8 11	14	SS-7 : Medium dense, grey, brown, fine to coarse SAND, little fine Gravel, little Silt		0.3 ND			
20		SS-8	20-22	24	14	10 12 16 22	28	SS-8 : Top 2": Brown, tan, fine to coarse SAND, little Gravel, little Silt Bottom 12": Brown, SILT, little fine Sand	5	ND ND		OUTWASH DEPOSITS	
25		SS-9	25-27	24	21	11 19 22 25	41	SS-9 : Dense, brown, tan, SILT and fine SAND, trace fine Gravel		ND ND			
30													

REMARKS

1 - Soil samples screened with a 10.6 eV MiniRAE photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. A "*" indicates a sample sent to a laboratory for additional analyses or screening. ND=None Detected above background.
2 - Hollow stem augers (HSA) methods used from 0 to 37 feet below ground surface.
3 - At 8 feet, driller introduced water to the augers after each sample to prevent running sand.
4 - Driller indicated increase in drilling resistance from 11.8 feet to 14. feet, possible concrete in auger spoils. Possible concrete in top of SS-6.
5 - Driller indicated Cobbles hitting augers at 19 feet below ground surface.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual.

Exploration No.: GZ-3

GZA TEMPLATE 0210.GDT GZA TEMPLATE TEST BORING REM6_CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:29:18 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-3
SHEET: 2 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: Rotary Wash

Boring Location: See Plan
Ground Surface Elev. (ft.): 7
Final Boring Depth (ft.): 37
Date Start - Finish: 4/5/2022 - 4/5/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Core Barrel Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/5/2022	1310	10.8	15 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Depth (ft.)	STRATUM Description	Elev. (ft.)
		SS-10	30-32	24	15	9 16 12 15	28	SS-10 : Medium dense, brown, tan, SILT and fine SAND, trace fine Gravel		ND		OUTWASH DEPOSITS	
35		SS-11	35-37	24		5 7 9 12	16	SS-11 : Medium dense, brown, tan, fine SAND, some Silt, trace fine Gravel		ND ND			
									6		37		-30.0
								End of exploration at 37 feet below grade.	7 8				
40													
45													
50													
55													
60													

REMARKS

6 - Falling head hydraulic conductivity test performed at 37 feet below grade.
7 - Borehole backfilled with spoils and cement.
8 - Ground surface elevation was interpolated from the topographic plan.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual.

Exploration No.: GZ-3

GZA TEMPLATE 0210.GDT GZA TEMPLATE TEST BORING REM6_CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:29:18 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-4 (OW)
SHEET: 1 of 3
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: Rotary Wash

Boring Location: See Plan
Ground Surface Elev. (ft.): 12
Final Boring Depth (ft.): 63.5
Date Start - Finish: 4/8/2022 - 4/8/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/8/2022	1515	11.4	75 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows per 6"	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data
		SS-1	0.3-2.3	24	19	6 12 22 11	34	SS-1 : Top 7": Dark brown, fine to coarse SAND and GRAVEL, little Silt, little Concrete, trace Brick, trace Asphalt Middle 4": Dark brown, fine to coarse SAND, some Gravel, trace Silt Bottom 3": Light brown, fine to medium SAND, little Gravel, trace Silt (Dry)	1 2 3	ND
		SS-2	2.3-4.3	24	15	8 18 18 17	36			ND
5		SS-3	5-7	24	9	96 54 27 25	81			ND
		SS-4	7-9	24	19	21 24 27 40	51	SS-2 : Dense, light brown, tan, fine to medium SAND, little Gravel, trace Silt (Dry)		ND
10		SS-5	10-12	24	14	8 4 4 5	8	SS-3 : Very dense, light brown, tan, white, fine to medium SAND, trace Silt (Dry)		ND
		SS-6	12-14	24	13	11 24 11 11	35	SS-4 : Top 10": Light brown, tan, fine to medium SAND, trace Silt		ND
15	80	SS-7	14-16	24	13	2 3 2 2	5	Bottom 9": Dark brown, fine to coarse SAND, and GRAVEL, little Silt, little Asphalt (Moist)	4	ND
	80	ST-1	16-16.5	6	0			SS-5 : Loose, dark brown, fine to coarse SAND, some Gravel, little Silt, trace Glass (Moist)	5	ND
	40	SS-8	17-19	24	24	3 5 14 17	19			ND
20	40 25	SS-9	20-22	24	8	7 7 10 10	17	SS-6 : Medium dense, dark brown, fine to coarse SAND and GRAVEL, little Silt, little Concrete (Moist)	6	ND
	25 30							SS-7 : Top 4": Dark brown, black, fine grained PEAT, little fine Sand Tv=0.35 TSF, PP=1.25 TSF		
	30 40									
25	50	SS-10	25-27	24	7	7 8 10 10	18	Middle 6": Dark brown, black, fine to coarse SAND and GRAVEL, little Silt		ND
	50 60							Bottom 3": Dark brown, black, SILT, little Sand, little Gravel, trace Roots Tv=0.2 TSF,		
	70									
30	70									

Stratum Description

Depth (ft.)	Elev. (ft.)	Description
0.3	11.7	ASPHALT
		FILL
14	-2.0	PEAT
16	-4.0	OUTWASH DEPOSITS

Roadway Box

Drill Spoils (0-18')
Bentonite (18'-20')
2" PVC Riser (0-58')

REMARKS

1 - Soil samples screened with a 10.6 eV MiniRAE photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. A "*" indicates a sample sent to a laboratory for additional analyses or screening. ND=None Detected above background.
2 - Monitoring well installed at 58 feet. Bentonite palced from 63.5 to 58 feet. 10 feet of 2" PVC well screen set at approximately 58 feet below grade. Well completed to ground surface with 48 feet of a 1", Schedule 40, thread, flush joing PVC Riser. Filter sand placed in annulus around well from 20 feet to 58 feet. Bentonite seal from 18 feet to 20 feet below grade. Remaining annulus filled with drill spoils form 0 to 18 feet below grade. Well finished with curb box and cement.
3 - Hollow stem auger methods (HSA) used from 0 to 14 feet below ground surface. Cased rotary washed methods used form 14 to 63.5 ft, driven with 300 lb. hammer, 4" O.D. casing.
4 - Tv= Torvane, PP=Pocket Penetrometer, unit=Tons/square foot (TSF). Torvane and Pocket Penetrometer are field readings of unconfined strength.
5 - Shelby tube would not push through soil, refusal.
6 - Falling head teset conducted at 20 and 25 ft. below ground surface; roller bit refusal, casing installed to 45 ft.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: GZ-4 (OW)

TEST BORING LOG GZA W/EQUIP_REM6 CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:28:10 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-4 (OW)
SHEET: 2 of 3
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: Rotary Wash

Boring Location: See Plan
Ground Surface Elev. (ft.): 12
Final Boring Depth (ft.): 63.5
Date Start - Finish: 4/8/2022 - 4/8/2022

H. Datum: See Plan
V. Datum: NAVD88

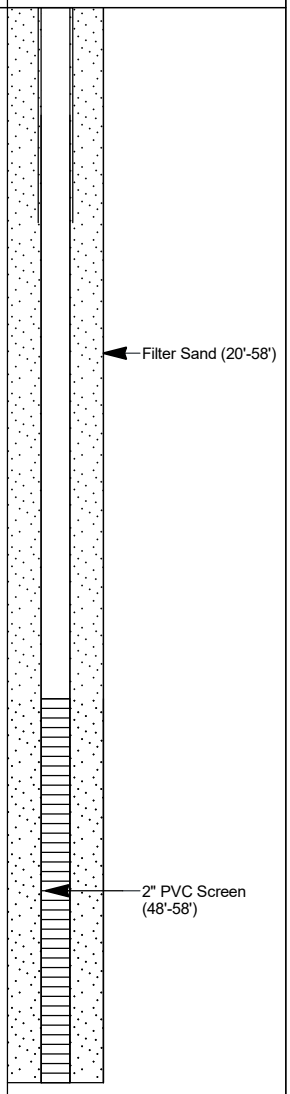
Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/8/2022	1515	11.4	75 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows per 6"	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
	100	SS-11	30-32	24	10	7 12		PP=1.0 TSF		ND			
	115					10 10	22	ST-1 : No Recovery					
	115							SS-8 : Medium dense, grey, fine to coarse SAND, little fine Gravel, trace Silt (Wet)					
	120												
	120							SS-9 : Medium dense, grey, fine to coarse SAND, some fine to coarse Gravel, little Silt (Wet)					
35	130	SS-12	35-37	24	8	12 14				ND			
	130					24 34	38	SS-10 : Medium dense, brown, fine to medium SAND, some Gravel, little Silt (Wet)					
	130												
	140							SS-11 : Top 7": Tan, brown, grey, fine SAND, litle Silt, trace Gravel					
	140												
40	140	SS-13	40-42	24	15	7 10				ND			
	150					12 19	22	Bottom 3": Red, fine SAND, little Silt					
	150							SS-12 : Dense, tan, brown, fine SAND, some Silt					
	150												
	150							SS-13 : Medium dense, tan, brown, fine SAND, little Silt					
45												OUTWASH DEPOSITS	
50													
									7				
55													
									8				
60													



REMARKS

7 - At 52.5 ft., driller stated roller bit resistance, possible gravel; drilling water changed from tan/brown to grey around 55 ft.
8 - At 58 ft., driller stated roller bit resistance, possible gravel or cobbles or weathered rock.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: GZ-4 (OW)

TEST BORING LOG GZA W/EQUIP_REM6 CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:28:10 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-4 (OW)
SHEET: 3 of 3
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: Rotary Wash

Boring Location: See Plan
Ground Surface Elev. (ft.): 12
Final Boring Depth (ft.): 63.5
Date Start - Finish: 4/8/2022 - 4/8/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Rock Core Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/8/2022	1515	11.4	75 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Pen. (in)	Rec. (in)	Blows per 6"	SPT Value	Sample Description Modified Burmister	Remark	Field Test Data	Stratum Depth (ft.)	Stratum Description	Stratum Elev. (ft.)
												OUTWASH DEPOSITS	
									9		63.5		-51.5
65		SS-14	63.5-63.5	0	0	100/0		SS-14 : No Recovery End of exploration at 63.5 feet.	10 11				
70													
75													
80													
85													
90													

REMARKS

9 - Roller bit refusal, no advancement, spoon refusal.
10 - Well removed and hole closed on 4/14/22.
11 - Ground surface elevation was interpolated from the topographic plan.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.: GZ-4 (OW)

TEST BORING LOG GZA W/EQUIP_REM6 CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:28:10 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-5
SHEET: 1 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: Rotary Wash

Boring Location: See Plan
Ground Surface Elev. (ft.): 10
Final Boring Depth (ft.): 34.6
Date Start - Finish: 4/7/2022 - 4/7/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Core Barrel Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/7/2022	1200	10.3	25 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Depth (ft.)	STRATUM Description	Elev. (ft.)
		SS-1	0-2	24	17	1 7 16 35	23	SS-1 : Top 7": Dark brown, fine to medium SAND, some Silt, little Gravel, trace Roots Bottom 10": Brown, fine to coarse SAND, some Gravel, little Silt, trace Brick	1 2	ND ND	0.5	TOPSOIL	9.5
		SS-2	2-4	24	17	14 19 11 8	30	SS-2 : Top 9": Brown, fine to coarse SAND, some Gravel, little Silt Bottom 5": Dark brown, fine to medium SAND and SILT, little Gravel, trace Roots		ND ND		FILL	
5	30 41	SS-3	4-6	24	19	2 3 4 7	7	SS-3 : Top 2": Dark brown, fine to medium SAND and SILT, trace Gravel, trace Roots Middle 6": Reddish brown, fine to medium SAND, some Silt, trace Gravel		ND ND	4.5		5.5
	45 56 58	SS-4	6-8	24	12	7 9 9 14	18	Bottom 11": Brown, fine to coarse SAND, little Gravel, trace Silt SS-4 : Medium dense, tan, brown, fine to coarse SAND, little Gravel, trace Silt		ND ND			
10	52 78 81 88	SS-5	10-12	24	12	15 15 20 24	35	SS-5 : Dense, brown, fine to coarse SAND and GRAVEL, trace Silt (Rock in tip)		ND ND			
15	98 58 62 68 75	SS-6	15-17	24	11	10 15 18 23	33	SS-6 : Top 3": Dark brown, fine to coarse SAND and GRAVEL, little Silt Bottom 5": Tan, brown, fine SAND and SILT	3	ND ND		OUTWASH DEPOSITS	
20	81 80 84 110	SS-7	20-22	24	10	6 7 9 13	16	SS-7 : Medium dense, tan, brown, fine SAND, some Silt		ND ND			
25	146 134 77 63 100	SS-8	25-27	24	13	7 8 12 19	20	SS-8 : Top 8": Grey, brown, fine to medium SAND, little Silt, trace Gravel Bottom 5": Grey SILT, some fine to medium Sand, little Gravel		ND ND	26.5		-16.5
	114 100											GLACIAL TILL	
30									4a		29.6	BEDROCK	-19.6

REMARKS

1 - Soil samples screened with a 10.6 eV MiniRAE photoionization detector (PID). PID values represent meter response in parts per million (ppm) relative to benzene in air and above background readings. A "*" indicates a sample sent to a laboratory for addit
2 - Hollow stem augers (HSA) methods used from 0 to 4 feet below ground surface, cased wash rotary from 4 feet to 28 feet, using 4-inch casing with 300-lbs hammer.
3 - Falling head hydraulic conductivity testing performed at 15 feet below grade.
4a - Casing and spoon refusal encountered at 29.6 feet below ground surface. Rock core taken from 29.6 feet to 34.6 below ground surface.
4b - Driller indicated increase in drilling resistance around 28 feet below ground surface.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual.

Exploration No.: GZ-5

GZA TEMPLATE 0210.GDT GZA TEMPLATE TEST BORING REM6_CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:29:19 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: GZ-5
SHEET: 2 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: Rotary Wash

Boring Location: See Plan
Ground Surface Elev. (ft.): 10
Final Boring Depth (ft.): 34.6
Date Start - Finish: 4/7/2022 - 4/7/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer with Cathead
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Core Barrel Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/7/2022	1200	10.3	25 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Depth (ft.)	STRATUM Description	Elev. (ft.)
	3:00	SS-9	29.5-	1	0	100/1"		SS-9 : No Recovery	4b				
	2:30	C-1	29.6	60	57			C-1 : Hard, slightly weathering, slight to moderate fracturing, fine to medium grained, grey GNEISS	5				
	2:20		29.6- 34.6					REC=95%, RQD= 85%				BEDROCK	
	2:10												
	2:00								6 7		34.6		-24.6
35								End of exploration at 34.6 feet below grade.	8				
40													
45													
50													
55													
60													

REMARKS

5 - Driller placed sand in borehole from 28 to 34.6 feet prior to conducting infiltration test at 28 feet below grade. Casing was lifted to 28 feet prior to conducting infiltration test.
6 - Borehole backfilled with auger spoils, sand and cement.
7 - Ground surface elevation was interpolated from the topographic plan.
8 - Core rate is in units of minutes per foot.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual.

Exploration No.: GZ-5

GZA TEMPLATE 0210.GDT GZA TEMPLATE TEST BORING REM6_CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:29:19 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: TP-3 PROBE
SHEET: 1 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 10
Final Boring Depth (ft.): 37.1
Date Start - Finish: 4/7/2022 - 4/7/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4-1/4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Core Barrel Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/7/2022	1500	10	10 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Depth (ft.)	STRATUM Description	Elev. (ft.)
5									1				
10													
15													
20									2				
25													
30													

REMARKS

1 - Auger probe conducted to bedrock/refusal.
2 - Sand/soil in auger spoils observed to be moist/wet at approximately 17 feet below ground surface.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual.

Exploration No.: TP-3 PROBE

GZA TEMPLATE 0210.GDT GZA TEMPLATE TEST BORING REM6_CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:31:02 PM

TEST BORING LOG

GZA GeoEnvironmental, Inc.
Engineers and Scientists

Stratford WPCF Perimeter Flood Wall Improvements
105 Beacon Point Road
Stratford, Connecticut

EXPLORATION NO.: TP-3 PROBE
SHEET: 2 of 2
PROJECT NO: 18.0172256.70
REVIEWED BY: C. Eggers

Logged By: M. Harris
Drilling Co.: Soil Testing
Foreman: P. DeAngelis

Type of Rig: Truck
Rig Model: Diedrich D120
Drilling Method: HSA

Boring Location: See Plan
Ground Surface Elev. (ft.): 10
Final Boring Depth (ft.): 37.1
Date Start - Finish: 4/7/2022 - 4/7/2022

H. Datum: See Plan
V. Datum: NAVD88

Hammer Type: Safety Hammer
Hammer Weight (lb.): 140
Hammer Fall (in.): 30
Auger or Casing O.D./I.D Dia (in.): 4-1/4 ID

Sampler Type: SS
Sampler O.D. (in.): 2.0
Sampler Length (in.): 24
Core Barrel Size: N/A

Groundwater Depth (ft.)

Date	Time	Water Depth	Stab. Time
4/7/2022	1500	10	10 min

Depth (ft)	Casing Blows/ Core Rate	Sample No.	Sample Depth (ft.)	Sample Pen. (in)	Sample Rec. (in)	Sample Blows (per 6 in.)	Sample SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	STRATUM Depth (ft.)	STRATUM Description	STRATUM Elev. (ft.)
35													
		SS-1	37-37.1	2	2			SS-1 : Very dense, grey, fine to coarse SAND and GRAVEL, trace Silt (Rock Fragments)	3 4 5		37.1	WEATHERED BEDROCK	27.1
40								End of exploration at 37.1 feet below grade.					
45													
50													
55													
60													

REMARKS

3 - Driller encountered auger refusal at 37 feet below ground surface.
4 - Augers cleared with water prior to taking sample SS-1.
5 - Borehole backfilled with auger spoils and cement.

Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual.

Exploration No.: TP-3 PROBE

GZA TEMPLATE 0210.GDT GZA TEMPLATE TEST BORING REM6_CASING 18.0172256.70 BORING LOGS.GPJ LIBRARY 012111.GLB 6/20/2022 2:31:02 PM

Appendix C – Test Pit Logs and Test Pit Photographs

TEST PIT FIELD LOG

GZA GEOENVIRONMENTAL, INC. **95 GLASTONBURY BLVD.** **GLASTONBURY, CT** **GEOTECHNICAL CONSULTANTS**	**SITE NAME** Stratford Water Pollution Control Facility **LOCATION** 105 Beacon Point Road, Stratford, Connecticut	**TEST PIT NO.:** **TP-1** **FILE NO.:** **18.0172256.70** **DATE:** **4/5/2022**

EXCAVATION EQUIPMENT

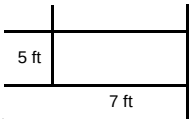
GZA ENGINEER: B. Sassaman
CONTRACTOR: Conte Company, LLC
OPERATOR: M. Ballard
WEATHER: M. Cloudy 35 - 50 °F
MAKE: CAT
MODEL: 304E2 CR
CAPACITY: 0.33 cu. yd.
REACH: 10 feet
GROUND ELEV.: 10 ft.
TIME STARTED: 0907
TIME COMPLETED: 1040

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-		0 - 2 ft: Brown, fine to medium SAND, some Silt, trace fine Gravel and Roots (TOPSOIL & SUBSOIL)	E	1A	
-2-			E	1A	1
-3-		2-4 ft.: Brown, fine to coarse GRAVEL, some fine to coarse Sand, little Silt, trace Concrete, Rebar and Plastic (Embankment Fill)	E	1A	
-4-			E		
-5-		4 - 6.5 ft: Tan, fine to medium SAND, little Silt, trace fine to coarse Gravel (SAND)	E		
-6-			E		
-7-		End of Exploration at 6.5 feet.	E		2,3
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

REMARKS:

1. Approximately 24"x 8"x 8" concrete block & rebar encountered at approximately 2 feet.
2. Groundwater not encountered
3. Test pit backfilled with excavated soils and compacted with plate compacter in approximately 12-inch thick lifts. Test pit finished at ground surface with seed and hay.
4. Elevation of boring estimated from interpolation of topography as shown on plan. Elevation references NAVD88.

TEST PIT PLAN



VOLUME = 7.5 cu. yd.

LEGEND:

BOULDER SIZE RANGE CLASSIFICATION	COUNT LETTER DESIGNATION
6"-18"	A
18"-36"	B
36" OR LARGER	C

PROPORTIONS USED	
TRACE (TR)	0-10%
LITTLE (LI)	10-20%
SOME (SO)	20-35%
AND	35-50%

EXCAVATION EFFORT

E	EASY
M	MODERATE
D	DIFFICULT

(NE) OBSERVED GROUNDWATER LEVEL

TEST PIT FIELD LOG

GZA GEOENVIRONMENTAL, INC. **95 GLASTONBURY BLVD.** **GLASTONBURY, CT** **GEOTECHNICAL CONSULTANTS**	**SITE NAME** Stratford Water Pollution Control Facility **LOCATION** 105 Beacon Point Road, Stratford, Connecticut	**TEST PIT NO.:** **TP-2** **FILE NO.:** **18.0172256.70** **DATE:** **4/5/2022**

EXCAVATION EQUIPMENT

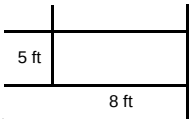
GZA ENGINEER: B. Sassaman
CONTRACTOR: Conte Company, LLC
OPERATOR: M. Ballard
WEATHER: M. Cloudy 35 - 50 °F
MAKE: CAT
MODEL: 304E2 CR
CAPACITY: 0.33 cu. yd.
REACH: 10 feet
GROUND ELEV.: +10
TIME STARTED: 1102
TIME COMPLETED: 1230

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-		0 - 1 ft: Brown, fine to coarse GRAVEL and SAND, some Silt, trace Roots (TOPSOIL/GROUND COVER)	E	3A	
-2-		1 - 4 ft: Light Brown/Brown, fine to coarse GRAVEL, some fine to coarse Sand, little Silt, trace Roots, Plastic, and Glass (EMBANKMENT FILL)	M/D	3A 1B	
-3-			D	5A 3B	
-4-			D	3A 1B	
-5-		4 - 6 ft: Tan/Light Brown/Orange, fine to medium SAND, little fine to coarse Gravel, little Silt (SAND)	E		
-6-			E		1, 2
-7-		End of Exploration at 6 feet.			
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

REMARKS:

1. Groundwater not encountered
2. Test pit backfilled with excavated soils and tamped in approximately 12-inch thick lifts with plate compactor. Test pit finished at ground surface with seed and hay.
3. Elevation of boring estimated from interpolation of topography as shown on plan. Elevation references NAVD88.

TEST PIT PLAN



VOLUME = 8.9 cu. yd.

LEGEND:

BOULDER SIZE RANGE CLASSIFICATION	COUNT LETTER DESIGNATION
6"-18"	A
18"-36"	B
36" OR LARGER	C

PROPORTIONS USED	
TRACE (TR)	0-10%
LITTLE (LI)	10-20%
SOME (SO)	20-35%
AND	35-50%

EXCAVATION EFFORT

E	EASY
M	MODERATE
D	DIFFICULT

(NE) OBSERVED GROUNDWATER LEVEL

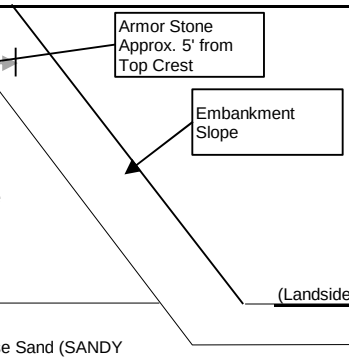
TEST PIT FIELD LOG

GZA GEOENVIRONMENTAL, INC. **95 GLASTONBURY BLVD.** **GLASTONBURY, CT** **GEOTECHNICAL CONSULTANTS**	**SITE NAME** Stratford Water Pollution Control Facility **LOCATION** 105 Beacon Point Road, Stratford, Connecticut	**TEST PIT NO.:** **TP-3** **FILE NO.:** **18.0172256.70** **DATE:** **4/4/2022**

EXCAVATION EQUIPMENT

GZA ENGINEER: C. Eggers
CONTRACTOR: Conte Company, LLC
OPERATOR: M. Ballard
WEATHER: Sunny, 50's
MAKE: CAT
MODEL: 304E2 CR
CAPACITY: 0.33 cu. yd.
REACH: 10 feet
GROUND ELEV.: 12 ft.
TIME STARTED: 11:00
TIME COMPLETED: 13:10

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-		0 - 0.75 ft: TOPSOIL	D		
		0.75 - 1.75 ft: Armor Stone Fill	M		1
-2-				1A	
-3-		1.75-4.25 ft. Brown, fine to medium SAND, some coarse Gravel, little Silt (Embankment Fill)	M	2B	
-4-			M		
-5-		4.25 - 5.25 ft: Light brown, SILT and fine to coarse Sand (SANDY SILT)	M		
-6-		(Stepped Excavation) 5.25 - 6.5 ft. Brown, fine to medium Sand and SILT (SILTY SAND)	M		
-7-			M		
-8-		6.5 - 7.5 ft. Brown, fine to coarse SAND, trace Silt (SAND)	M		
-9-			M		
-10-		7.5 - 9.0 ft. Brown, fine SAND and fine to coarse Gravel, trace Silt (GRAVELY SAND)	M		2, 3
-11-		End of Exploration			
-12-					
-13-					
-14-					



REMARKS:

1. Armor Stone sizes: 2 ft x 3 ft x1 ft, 4 ft x1 ft x 1 ft, 2 ft x 0.9 ft x 0.3 ft within excavation limits.
2. Groundwater not encountered.
3. Test pit backfilled with excavated soils and compacted with plate compacter in approximately 12-inch thick lifts. Armor stone reset in place. Test pit finished at ground surface with seed and hay.
4. Elevation of boring estimated from interpolation of topography as shown on plan. Elevation references NAVD88.

TEST PIT PLAN

11 ft. × 8 ft

NORTH

VOLUME = 16 cu. yd.

LEGEND:

BOULDER SIZE RANGE CLASSIFICATION	COUNT LETTER DESIGNATION
6"-18"	A
18"-36"	B
36" OR LARGER	C

PROPORTIONS USED	
TRACE (TR)	0-10%
LITTLE (LI)	10-20%
SOME (SO)	20-35%
AND	35-50%

EXCAVATION EFFORT

E	EASY
M	MODERATE
D	DIFFICULT

(NE) OBSERVED GROUNDWATER LEVEL

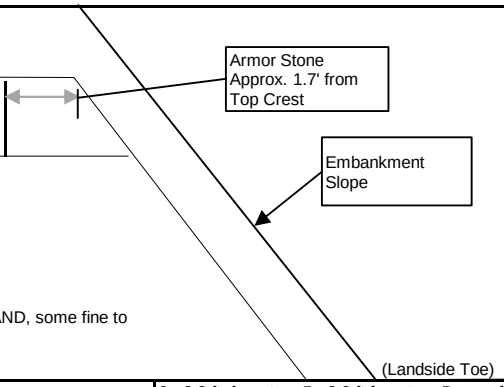
TEST PIT FIELD LOG

GZA GEOENVIRONMENTAL, INC. **95 GLASTONBURY BLVD.** **GLASTONBURY, CT** **GEOTECHNICAL CONSULTANTS**	**SITE NAME** Stratford Water Pollution Control Facility **LOCATION** 105 Beacon Point Road, Stratford, Connecticut	**TEST PIT NO.:** **TP-4** **FILE NO.:** **18.0172256.70** **DATE:** **4/4/2022**

EXCAVATION EQUIPMENT

GZA ENGINEER: C. Eggers
CONTRACTOR: Conte Company, LLC
OPERATOR: M. Ballard
WEATHER: Sunny, 50's
MAKE: CAT
MODEL: 304E2 CR
CAPACITY: 0.33 cu. yd.
REACH: 10 feet
GROUND ELEV.: 15 ft.
TIME STARTED: 07:20
TIME COMPLETED: 12:00

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
		Top of Dike			
-1-		0 - 1 ft.: TOPSOIL, increases to 1.7 ft thick on side slope of dike	E		
-2-		1 - 2 ft.: Armor Stone Fill	D	4B	1
-3-			M		
-4-			M		
-5-		2 - 5 ft.: Brown, fine to medium SAND, some fine to coarse Gravel, little Silt (Fill)	M		
-6-		(Stepped and Sloped Excavation) 0 - 3.3 ft. from toe, 5 - 8.3 ft from top: Brown, fine to medium SAND, some fine to coarse Gravel, little Silt (Fill)	M		
-7-			M		
-8-			M		
-9-			M		
-10-		3.3 - 5.0 ft. from toe grade, 8.8 - 10 ft. from top : Brown SILT and fine Sand	M		
-11-		5.0- 6.0 ft. from toe grade, 10 - 11 ft. from top: Brown SAND, some fine to coarse Gravel, trace Silt	M		2,3,4
-12-		End of Exploration			
-13-					
-14-					



REMARKS:

1. Armor stone size within excavation limits was 1.7 ft x 1.5 ft x 0.7 ft, 1 ft x 1.8 ft x 0.7 ft, and (2) 1 ft x 0.5 ft x 0.8 ft.
2. Groundwater not encountered.
3. Toe underdrain not encountered.
4. Test pit backfilled with excavated soils and compacted with plate compacter in approximately 12-inch thick lifts. Armor stone reset in place. Test pit finished at ground surface with seed and hay.
5. Elevation of boring estimated from interpolation of topography as shown on plan. Elevation references NAVD88.

TEST PIT PLAN

9 ft. × 8 ft

9 ft

NORTH

VOLUME = cu. yd.

LEGEND:

BOULDER SIZE RANGE CLASSIFICATION	COUNT LETTER DESIGNATION
6"-18"	A
18"-36"	B
36" OR LARGER	C

PROPORTIONS USED	
TRACE (TR)	0-10%
LITTLE (LI)	10-20%
SOME (SO)	20-35%
AND	35-50%

EXCAVATION EFFORT

E	EASY
M	MODERATE
D	DIFFICULT

(NE) OBSERVED GROUNDWATER LEVEL

TEST PIT FIELD LOG

GZA GEOENVIRONMENTAL, INC. **95 GLASTONBURY BLVD.** **GLASTONBURY, CT** **GEOTECHNICAL CONSULTANTS**	**SITE NAME** Stratford Water Pollution Control Facility **LOCATION** 105 Beacon Point Road, Stratford, Connecticut	**TEST PIT NO.:** **TP-5** **FILE NO.:** **18.0172256.70** **DATE:** **4/5/2022**

EXCAVATION EQUIPMENT

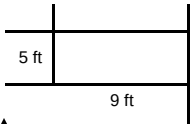
GZA ENGINEER: B. Sassaman
CONTRACTOR: Conte Company, LLC
OPERATOR: M. Ballard
WEATHER: M. Cloudy 35 - 50 °F
MAKE: CAT
MODEL: 304E2 CR
CAPACITY: 0.33 cu. yd.
REACH: 10 feet
GROUND ELEV.:
TIME STARTED: 0720
TIME COMPLETED: 0904

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-		0 - 2 ft: Dark Brown, fine to coarse GRAVEL, some fine to coarse Sand, some Silt, trace Roots (ARMOR STONE FILL)	D	1B 1C	1, 2
-2-			D	6A 3B	
-3-		2 - 5.5 ft: Light Brown, fine to coarse GRAVEL, some fine to coarse Sand, little Silt, trace Roots (EMBANKMENT FILL)	D	5A	
-4-			D	5A	
-5-			M		
-6-			M		3, 4
-7-		End of Exploration at 5.5 feet.			
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

REMARKS:

1. Surficial Class B and C Boulder Fill encountered extending down embankment on west side of excavation.
2. Approximately 12-inches of Topsoil over Embankment Fill encountered on east side of excavation.
3. Groundwater not encountered
4. Test pit backfilled with excavated soils in approximately 12-inch thick lifts with plate compactor. Test pit finished at ground surface with seed and hay.
5. Elevation of boring estimated from interpolation of topography as shown on plan. Elevation references NAVD88.

TEST PIT PLAN



VOLUME = 9.2 cu. yd.

LEGEND:

BOULDER SIZE RANGE CLASSIFICATION	COUNT LETTER DESIGNATION
6"-18"	A
18"-36"	B
36" OR LARGER	C

PROPORTIONS USED	
TRACE (TR)	0-10%
LITTLE (LI)	10-20%
SOME (SO)	20-35%
AND	35-50%

EXCAVATION EFFORT

E	EASY
M	MODERATE
D	DIFFICULT

(NE) OBSERVED GROUNDWATER LEVEL

TEST PIT FIELD LOG

GZA GEOENVIRONMENTAL, INC. **95 GLASTONBURY BLVD.** **GLASTONBURY, CT** **GEOTECHNICAL CONSULTANTS**	**SITE NAME** Stratford Water Pollution Control Facility **LOCATION** 105 Beacon Point Road, Stratford, Connecticut	**TEST PIT NO.:** **TP-6** **FILE NO.:** **18.0172256.70** **DATE:** **4/7/2022**

EXCAVATION EQUIPMENT

GZA ENGINEER: C. Eggers
CONTRACTOR: Conte Company, LLC
OPERATOR: M. Ballard
WEATHER: Cloudy 40's
MAKE: CAT
MODEL: 304E2 CR
CAPACITY: 0.33 cu. yd.
REACH: 10 feet
GROUND ELEV.: 10 ft. NAVD 88
TIME STARTED: 0700
TIME COMPLETED: 0740

DEPTH	PID (ppm)	SOIL DESCRIPTION	EXCAV. EFFORT	BOULDER COUNT QTY. CLASS	REMARK NO.
-1-		0 - 1 ft: Armor Stone Layer sizes: 48"x33"x10", 17"x32"x10", 12"x9"x22", up to 14" thick adjoining excavation	D		1
-2-		1 - 2 ft. Dark brown, fine to coarse SAND and coarse Gravel, trace Silt, Roots (EMBANKMENT FILL)	D		1
-3-		2 - 3.5 ft. Light brown, fine to medium SAND, some Silt (EMBANKMENT FILL)	M		
-4-			M	1A	
-5-		3.5 - 4.25 ft. Brown, fine to coarse SAND, some fine to coarse Gravel, some Silt (EMBANKMENT FILL)	M	2A	
-6-		4.25 - 5 ft. Dark brown, fine SAND and Silt, possible old Topsoil (FILL)	D	1B	1
-7-		End of Exploration			
-8-					
-9-					
-10-					
-11-					
-12-					
-13-					
-14-					

REMARKS:

1. Test pit backfilled with excavated soils an dcompacted with Waker 1990 WP plate compactor in lifts. Armor Stone Reset at surface and test pit finished at ground surface with seed and hay.
2. Groundwater not encountered.
3. Elevation of boring estimated from interpolation of topography as shown on plan. Elevation references NAVD88.

TEST PIT PLAN

3 ft. × 5 ft.

NORTH

VOLUME = 7.1 cu. yd.

LEGEND:

BOULDER SIZE RANGE CLASSIFICATION	COUNT LETTER DESIGNATION
6"-18"	A
18"-36"	B
36" OR LARGER	C

PROPORTIONS USED

TRACE (TR)	0-10%
LITTLE (LI)	10-20%
SOME (SO)	20-35%
AND	35-50%

EXCAVATION EFFORT

E	EASY
M	MODERATE
D	DIFFICULT

(DRY) OBSERVED GROUNDWATER LEVEL