

OFFICIAL BID ADVERTISEMENT

East Lyme Water and Sewer Department

“Well 5 WTP Backwash Lagoon Expansion”

Sealed bids will be received at the Water & Sewer Office, **East Lyme Town Hall until 10 AM Friday February 16, 2024**. This bid advertisement entails expanding the existing lagoon from approximately 15,508 CF to 40,418 CF. The Well 5 WTP backwash lagoons are located adjacent to 21 Filosi Rd, East Lyme, CT 06333. This work will include; site work, ductile iron pipe work and a perimeter fence.

The Standard Bid and Contract Terms and Conditions and the Bid Forms and Technical Specifications can be found on the Town’s website at eltownhall.com.

A mandatory pre-bid meeting will be held at the Well 5 WTP site on Wednesday January 31, 2024 at 10am. Contact East Lyme Water below to get directions and register.

Any questions regarding this bid should be emailed to Matthew Garneau (mgarneau@eltownhall.com) no later than **4 PM on Friday February 9, 2024**, in case an addendum needs to be sent to all prospective bidders.

The East Lyme Water and Sewer Department reserves the right to accept or reject any or all bids; to waive any informality, or; to accept any bid deemed in the best interests of the East Lyme Water and Sewer Department.

East Lyme Water and Sewer Department

AN AFFIRMATIVE ACTION/EQUAL OPPORTUNITY EMPLOYER

MBE/WBE AND SBE’s are encouraged to bid

East Lyme Water and Sewer Department

PO Box 519

108 Pennsylvania Ave, Niantic, CT 06357

STANDARD BID & CONTRACT TERMS AND CONDITIONS

All Invitations for Bids issued by the Town of East Lyme Water and Sewer Department (“East Lyme Water and Sewer Department”, “Water and Sewer Department”, or “Town”) will bind Bidders to the terms and conditions listed below, unless specified otherwise in any individual Invitation for Bid.

Submission of Bids

1. Bids must be submitted on forms supplied by the Town of East Lyme Water and Sewer Department. Telephone or facsimile bids will not be accepted in response to any Invitation for Bids.
2. All blank spaces for bid prices must be filled in, in ink or typewritten.
3. Each bid must be submitted in a sealed envelope bearing on the outside, the name of the bidder, his/her address, and the name of the project for which the bid is submitted.
4. If it becomes necessary to revise any part of this request or if additional data is necessary to enable interpretation of provisions of this document, an addenda will be provided to all prospective firms who receive this document, or notify the Town that they wish to submit a bid; such addenda will additionally be posted on the following website: eltownhall.com. The addenda document would need to be acknowledged on the Bid Form. The Town of East Lyme Water and Sewer Department does not assume responsibility for any contractor that does not receive an addenda, where the contractor has not acknowledged receipt of any portion thereof.
5. Incomplete Bid forms may result in the rejection of the Bid. Amendments to Bids received by the Town after the time specified for opening of Bids, shall not be considered. Bids shall be computer prepared, typewritten or handwritten in ink. All Bids shall be signed by a person duly authorized to sign Bids on behalf of the Bidders. Errors, alterations or corrections on both the original and copy of the Bid schedule to be returned must be initialed by the person signing the Bid or their authorized designee. In the event an authorized designee initials the correction, there must be written authorization from the person signing the Bid to the person initialing the erasure, alterations, or correction. Failure to do so shall result in rejection of Bid for those items erased, altered or corrected and not initialed.
6. The Town of East Lyme Water and Sewer Department reserves the right to accept or reject any and all Bid responses, in whole or in part, to waive technical defects, irregularities and omissions if, in its judgment, the best interests of the Town will be served.
7. Conditional Bids are subject to rejection in whole or in part. A conditional Bid is defined as one which limits, modifies, expands or supplements any of the terms and conditions and/or specifications of the invitation for Bids.
8. Pursuant to Section 12-412 of the Connecticut General Statutes, municipalities are exempt from the payment of excise, transportation and sales taxes imposed by the Federal Government and/or the State. Such taxes must not be included in Bid prices.
9. By its submission, the Bidder represents that the Bid is not made in connection with any other Bidders submitting a Bid for the same commodity or commodities and is in all respects fair and without collusion or fraud.

Qualifications of the Bidder

The East Lyme Water and Sewer Department may make whatever investigations it deems necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Water and Sewer Department all information and data for this purpose as the Water and Sewer Department may request. The Water and Sewer Department reserves the right to reject any bid if the evidence submitted by, or investigation of, the bidder fails to satisfy the Water and Sewer Department that the bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein.

Insurance Requirements

The Town of East Lyme Water and Sewer Department requires the Contractor to carry the following insurance coverages insurance to protect it from loss. The following minimum limits shall be met:

- **General Liability:** \$1,000,000 each occurrence; \$2,000,000 aggregate
- **Automobile Liability:** \$1,000,000 for owned, non owned and leased vehicles in a combined single limit for each accident
- **Workers' Compensation:** Shall be in accordance with State of Connecticut requirements at the time of the contract. The policy must contain a waiver of subrogation in favor of the Town of East Lyme, executed by the insurance company
- **Umbrella/Excess Liability:** \$5,000,000 each occurrence; \$5,000,000 aggregate and providing coverage over the Commercial General Liability, Commercial Automobile Liability and the Employer Liability section of the Workers Compensation coverage.
- **Pollution Liability:** \$1,000,000 each occurrence; \$1,000,000 aggregate

The Town of East Lyme, the Town of East Lyme Water and Sewer Department, its officers (both elected and appointed), employees, and agents shall be named as additional insured per contract on all policies, except Workers Compensation, on a primary and non- contributory basis. A waiver of subrogation applies in favor of the Town of East Lyme with respect to GL, Auto, Umbrella/ Excess and WC. Thirty (30) days' notice of cancellation is required and must be provided to the Town of East Lyme via certified mail.

If the Contractor has any subcontractors perform work on this project, the Water and Sewer Department would need to have a list of the contractors, what work they are performing and their insurance limits and requirements, including additional insured status of Town, that also meets the above standards.

Bid Bond

All Bidders shall furnish with their Bid a bid security in the form of a bid bond, cash or a certified check, treasurer's check or cashier's check issued by a responsible bank or trust company, in the amount of 5% of the total amount of the Bid and made payable to the Town of East Lyme.

Payment Bond

Contractor shall furnish a payment bond, in an amount at least equal to the Contract Price, as security for the faithful payment of all of Contractor's obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due.

Indemnification

To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Town of East Lyme and the Town of East Lyme Water and Sewer Department from and against any and all claims, expenses (including attorney fees), judgments, damages to property or injuries to or death of any person or persons, including but not limited to property and employees or agents of the Town and the Water and Sewer Department and shall defend suits, actions or proceedings of any kind or nature including workmen's compensation claims, of or by anyone whomsoever in any way resulting from or arising out of this project and from the operations of the contractor or subcontractors hired by Contractor to perform this Work. Insurance coverage specified herein constitutes the minimum requirements and said requirements shall in no way lessen or limit the liability of the Contractor under the terms of the contract. The Contractor shall procure and maintain, at his own cost and expense, any additional kinds and amount of insurance which in his own judgment, may be necessary for his proper protection in the execution of his work. The Contractor agrees to well and truly save and indemnify and hold harmless the Town of East Lyme and the Town of East Lyme Water and Sewer Department against all liability, judgments, costs and expenses which may in any way come against the Town and the Water and Sewer Department or which may in any way result from carelessness, omission or neglect of the contractor or his agent, subcontractors, employees or workmen in any way arising or resulting from the operation in connection herewith. This provision shall survive the termination of this Contract for services.

Damage to Abutting Properties

The Contractor shall be liable and responsible for, and reimburse the Town of East Lyme Water and Sewer Department, adjacent property owners and/or others for, any and all losses, damage or expense which the Town or those others may suffer, either directly or indirectly or through any claims of any person or party, for any trespass outside the spaces and rights of way provided by the Water and Sewer Department to the Contractor, for any property damage caused in whole or in part by Contractor and any of his employees or subcontractors while performing this Work, and or any violation or disregard of the terms and conditions established for the use or occupancy of those rights or for negligence in the exercise of those rights. The Water and Sewer Department may retain or deduct from any sum or sums

due or to become due to the Contractor such amount or amounts as may be proper to insure the Water and Sewer Department against loss or expense, by reason of the failure of the Contractor to observe the limits and conditions of the rights of way, rights of access, etc., provided by the Water and Sewer Department.

Relationship Between Parties

There is no employment relationship, express or implied, between Contractor and the Town of East Lyme. All Contractors, including successful bidder, are independent contractors.

Timing of Work

It is the intention of the Water Department to have the work substantially completed by **June 1, 2024**, at the latest unless there are weather or other events that are out of the control of the Contractor. The Water and Sewer Department will be the party that determines if the delays are caused by conditions out of the Contractor's control.

Site Limitations, Safety and Maintenance and Protection of Traffic

The Contractor should be aware of the space limitations and road access available on this site. Several site restrictions will likely cause consideration of special means and methods that may become necessary as a result of the limited space available. **A SITE VISIT IS REQUIRED PRIOR TO THE SUBMISSION OF BID.** The Contractor shall comply with all requirements of the Occupational Safety and Health Act (OSHA). If required for the safe operation and site access of equipment and vehicles it is the Contractor's responsibility to set up a safe traffic work zone pursuant to the latest edition of the Manual of Uniform Traffic Control (MUTCD). The cost of setting up the work zone safety pattern and hiring authorized and qualified traffic control personnel shall be incorporated into the pricing on the bid form, including lump sum.

Measurement of Quantities & Payment

The Contractor will be paid monthly by the approximate percent complete as approved by the East Lyme project manager. The Water and Sewer Department will make every effort to pay the Contractor in a timely fashion upon receipt of the invoice.

Award of Bid

The Water and Sewer Department intends to award a contract to a responsible bidder that the Water and Sewer Department determines can properly complete the job in the time period requested at the lowest total price as indicated on the Bid Form.

Prevailing Wages

This should be considered a prevailing wage job. As such, the contractor and any subcontractors should be paid at least the minimum as identified in the attached Prevailing Wage document from the State of Connecticut. Attached to any invoice, the contractor must provide to the town certified payrolls for all contractor and subcontractor employees assigned to the job showing that the prevailing wage rate was paid.

Technical Specifications and Design

The contractor shall conform to the specifications outlined in the attached, enclosed, or otherwise referenced "EAST LYME WELL 5 BACKWASH LAGOON EXPANSION". Any questions regarding this specifications and design should be brought to the East Lyme Water and Sewer Department prior to submitting a bid, a thorough review of these specifications is strongly encouraged.

BID FORM

Well 5 WTP Backwash Lagoon Expansion

FROM: _____ (Bidder)

TO: Town of East Lyme Water and Sewer Department
Public Works Office – Lower Level of Town Hall
PO Box 519, 108 Pennsylvania Ave, Niantic, CT 06357

The undersigned proposes to furnish through his bid price all charges, including all supervision, technical personnel, labor, materials, equipment, tools, appurtenances, services, and anything else necessary to perform and complete this Contract pursuant to the Standard Bid & Contract Terms and Conditions and Technical Specifications for the price(s) as listed below.

Description

Backwash Lagoon Construction according to the Technical Specification/Design Drawing:

Base Bid (Lump Sum) _____

TOTAL AMOUNT BID = _____

LIST OF REFERENCES

	<i>NAME</i>	<i>ORGANIZATION</i>	<i>CONTACT #</i>
1.	_____	_____	_____
2.	_____	_____	_____

ADDENDA RECEIPT

Receipt of the following Addenda is hereby acknowledged:

Addendum No. _____ Dated _____

The undersigned agrees to complete this work based on the project specifications for the above referenced bid price(s) if awarded.

Signature _____ Main Contact # _____

Print Name _____ Address _____

Email Address _____

EXAMPLE CONTRACT FOR “EAST LYME WELL 5 BACKWASH LAGOON EXPANSION”

BETWEEN (Contractor) AND THE TOWN OF EAST LYME WATER AND SEWER DEPARTMENT

THIS AGREEMENT, made this *xx* th day of (*month*), 2024 by and between the Town of East Lyme Water and Sewer Commission, Connecticut, herein called the “Owner”, acting herein through its Chairman, Mr. Dan Cunningham, and *Contractor* of *Town*, in xxx County, and the State of Connecticut, hereinafter called the “Contractor”.

WITNESSETH: That for and in consideration the payments and agreements hereinafter mentioned, to be made and performed by the OWNER and the CONTRACTOR hereby agrees with the OWNER to provide “**EAST LYME WELL 5 BACKWASH LAGOON EXPANSION**” in accordance with the attached Contract Terms and Conditions bid documents, and the Bid Form that are hereby made part of this contract.

This agreement shall extend from the date it is signed until completion of the work.

The parties further agree to be contractually bound to submit themselves to the personal jurisdiction of the courts of Connecticut. The venue for any court proceeding shall be in the Judicial District for New London at New London, Connecticut.

The failure of any party to insist in any one or more instances upon performance of any of the terms or conditions of this Agreement shall not be construed as a waiver or a relinquishment of any right granted hereunder or of the future performance of any such term, covenant, or condition; but the obligations of the parties with respect thereto shall continue in full force and effect.

This Agreement cannot be changed, modified or amended in any respect except by a written instrument signed by the parties hereto. Parties acknowledge and agree that all understandings and agreements heretofore made between the parties are merged in this agreement.

This instrument contains the entire agreement of the parties. It may not be changed orally, but only by an agreement in writing signed by the party against whom enforcement of any waiver, change, modification, extension or discharge is sought.

This agreement may not be assigned by any party hereto without the written consent of the other party. The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the contract.

IN WITNESS WHEREOF, the parties to these presents have executed this contract in the year and day first above mentioned.

**TOWN OF EAST LYME
WATER AND SEWER DEPARTMENT**

Name of Contractor

(OWNER)

(CONTRACTOR)

BY: _____
Dan Cunningham

BY: _____
Authorized Representative

TITLE: Chairman, First Selectman

TITLE: _____

DATE: _____

DATE: _____

BID BOND

Any singular reference to Bidder, Surety, Owner or other party shall be considered plural where applicable.

BIDDER (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

BID

Bid Due Date:

Description (*Project Name— Include Location*):

BOND

Bond Number:

Date:

Penal sum _____

\$ _____

(Words)

(Figures)

Surety and Bidder, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Bid Bond to be duly executed by an authorized officer, agent, or representative.

BIDDER

SURETY

(Seal)

(Seal)

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____

Signature

By: _____

Signature (Attach Power of Attorney)

Print Name

Print Name

Title

Title

Attest: _____

Signature

Attest: _____

Signature

Title

Title

Note: Addresses are to be used for giving any required notice.

Provide execution by any additional parties, such as joint venturers, if necessary.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to pay to Owner upon default of Bidder the penal sum set forth on the face of this Bond. Payment of the penal sum is the extent of Bidder's and Surety's liability. Recovery of such penal sum under the terms of this Bond shall be Owner's sole and exclusive remedy upon default of Bidder.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1 Owner accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by Owner) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents, or
 - 3.2 All Bids are rejected by Owner, or
 - 3.3 Owner fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by Paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from Owner, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by Owner and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from the Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in Paragraph 4 above is received by Bidder and Surety and in no case later than one year after the Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier, or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of Surety to execute, seal, and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer, or proposal as applicable.

PAYMENT BOND

CONTRACTOR *(name and address)*:

SURETY *(name and address of principal place of business)*:

OWNER *(name and address)*:

CONSTRUCTION CONTRACT

Effective Date of the Agreement:

Amount:

Description *(name and location)*:

BOND

Bond Number:

Date *(not earlier than the Effective Date of the Agreement of the Construction Contract)*:

Amount:

Modifications to this Bond Form: None See Paragraph 18

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

CONTRACTOR AS PRINCIPAL

SURETY

_____ *(seal)*

Contractor's Name and Corporate Seal

_____ *(seal)*

Surety's Name and Corporate Seal

By: _____

Signature

By: _____

Signature *(attach power of attorney)*

Print Name

Print Name

Title

Title

Attest: _____

Signature

Attest: _____

Signature

Title

Title

Notes: (1) Provide supplemental execution by any additional parties, such as joint venturers. (2) Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

1. The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials, and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.
2. If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies, and holds harmless the Owner from claims, demands, liens, or suits by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.
3. If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 13) of claims, demands, liens, or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, and tendered defense of such claims, demands, liens, or suits to the Contractor and the Surety.
4. When the Owner has satisfied the conditions in Paragraph 3, the Surety shall promptly and at the Surety's expense defend, indemnify, and hold harmless the Owner against a duly tendered claim, demand, lien, or suit.
5. The Surety's obligations to a Claimant under this Bond shall arise after the following:
 - 5.1 Claimants who do not have a direct contract with the Contractor,
 - 5.1.1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
 - 5.1.2 have sent a Claim to the Surety (at the address described in Paragraph 13).
 - 5.2 Claimants who are employed by or have a direct contract with the Contractor have sent a Claim to the Surety (at the address described in Paragraph 13).
6. If a notice of non-payment required by Paragraph 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Paragraph 5.1.1.
7. When a Claimant has satisfied the conditions of Paragraph 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:
 - 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and
 - 7.2 Pay or arrange for payment of any undisputed amounts.
 - 7.3 The Surety's failure to discharge its obligations under Paragraph 7.1 or 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Paragraph 7.1 or 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.
8. The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Paragraph 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.
9. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.
10. The Surety shall not be liable to the Owner, Claimants, or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to or give notice on behalf of Claimants, or otherwise have any obligations to Claimants under this Bond.
11. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders, and other obligations.

12. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Paragraph 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
13. Notice and Claims to the Surety, the Owner, or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.
14. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
15. Upon requests by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.
16. **Definitions**
 - 16.1 **Claim:** A written statement by the Claimant including at a minimum:
 1. The name of the Claimant;
 2. The name of the person for whom the labor was done, or materials or equipment furnished;
 3. A copy of the agreement or purchase order pursuant to which labor, materials, or equipment was furnished for use in the performance of the Construction Contract;
 4. A brief description of the labor, materials, or equipment furnished;
 5. The date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
 6. The total amount earned by the Claimant for labor, materials, or equipment furnished as of the date of the Claim;
 7. The total amount of previous payments received by the Claimant; and
 - 16.2 **Claimant:** An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials, or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms of "labor, materials, or equipment" that part of the water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.
 - 16.3 **Construction Contract:** The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.
 - 16.4 **Owner Default:** Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.
 - 16.5 **Contract Documents:** All the documents that comprise the agreement between the Owner and Contractor.
8. The total amount due and unpaid to the Claimant for labor, materials, or equipment furnished as of the date of the Claim.
17. If this Bond is issued for an agreement between a contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.
18. Modifications to this Bond are as follows:

Minimum Rates and Classifications for Heavy/Highway Construction

ID#: 24-56796

**Connecticut Department of Labor
Wage and Workplace Standards**

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:

Project Town: East Lyme

State#:

FAP#:

Project: Well 5 WTP Backwash Lagoon Expansion

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	45.21	29.05
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	41.63	34.50
2) Carpenters, Piledrivermen	37.61	27.61
2a) Diver Tenders	37.61	27.61
3) Divers	46.07	27.61
03a) Millwrights	40.56	28.87
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	56.25	25.15
4a) Painters: Brush and Roller	37.62	24.55
4b) Painters: Spray Only	40.62	24.55

As of: January 8, 2024

4c) Painters: Steel Only	39.62	24.55
4d) Painters: Blast and Spray	40.62	24.55
4e) Painters: Tanks, Tower and Swing	39.62	24.55
4f) Elevated Tanks (60 feet and above)	46.62	24.55
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)	42.6	33.21+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	42.37	40.02 + 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)	48.28	35.50
----LABORERS----		
8) Group 1: General Laborers and concrete specialist	33.5	25.59
8) Group 1a: Acetylene Burners (Hours worked with a torch)	34.5	25.59
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	33.75	25.59
10) Group 3: Pipelayers	34.0	25.59
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	34.0	25.59

As of: January 8, 2024

12) Group 5: Toxic waste removal (non-mechanical systems)	35.5	25.59
13) Group 6: Blasters	35.25	25.59
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	36.5	25.59
Group 8: Traffic control signalmen	20.1	25.59
Group 9: Hydraulic Drills	34.25	25.59
Group 10: Toxic Waste Removers A or B With PPE	36.5	25.59
----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	35.73	25.59 + a
13b) Brakemen, Trackmen, Miners' Helpers and all other men	34.76	25.59 + a
----CLEANING, CONCRETE AND CAULKING TUNNEL----		
14) Concrete Workers, Form Movers, and Strippers	34.76	25.59 + a
15) Form Erectors	35.09	25.59 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		

As of: January 8, 2024

16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers, Miners Helpers	34.76	25.59 + a
17) Laborers Topside, Cage Tenders, Bellman	34.65	25.59 + a
18) Miners	35.73	25.59 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	42.22	25.59 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	42.02	25.59 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	40.04	25.59 + a
21) Mucking Machine Operator, Grout Boss, Track Boss	42.81	25.59 + a
----TRUCK DRIVERS----(*see note below)		
Two Axle Trucks, Helpers	32.16	30.51 + a
Three Axle Trucks; Two Axle Ready Mix	32.27	30.51 + a
Three Axle Ready Mix	32.33	30.51 + a
Four Axle Trucks	32.39	30.51 + a
Four Axle Ready-Mix	32.44	30.51 + a

As of: January 8, 2024

Heavy Duty Trailer (40 tons and over)	34.66	30.51 + a
Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	32.44	30.51 + a
Heavy Duty Trailer (up to 40 tons)	33.39	30.51 + a
Snorkle Truck	32.54	30.51 + a
----POWER EQUIPMENT OPERATORS----		
Group 1: Crane Handling or Erecting Structural Steel or Stone, Hoisting Engineer (2 drums or over). (Trade License Required)	52.78	27.80 + a
Group 1a: Front End Loader (7 cubic yards or over); Work Boat 26 ft. and over.	48.37	27.80 + a
Group 2: Cranes (100 ton rate capacity and over); Bauer Drill/Caisson. (Trade License Required)	52.41	27.80 + a
Group 2a: Cranes (under 100 ton rated capacity).	51.51	27.80 + a
Group 2b: Excavator over 2 cubic yards; Pile Driver (\$3.00 premium when operator controls hammer).	48.0	27.80 + 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)	47.1	27.80 + a
Group 4: Trenching Machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper).	46.64	27.80 + a
Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps;	45.92	27.80 + a

As of: January 8, 2024

Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" mandrel)

Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller. 45.92 27.80 + a

Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer). 45.55 27.80 + 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) 45.14 27.80 + a

Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine. 44.67 27.80 + 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). 44.14 27.80 + a

Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc. 41.69 27.80 + a

Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment. 41.69 27.80 + a

Group 12: Wellpoint Operator. 41.61 27.80 + a

Group 13: Compressor Battery Operator. 40.92 27.80 + a

Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain). 39.54 27.80 + a

As of: January 8, 2024

Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	39.06	27.80 + a
Group 16: Maintenance Engineer.	38.28	27.80 + a
Group 17: Portable Asphalt Plant Operator; Portable Crusher Plant Operator; Portable Concrete Plant Operator., Portable Grout Plant Operator, Portable Water Filtration Plant Operator.	43.46	27.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	40.54	27.80 + a

**NOTE: SEE BELOW

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

20) Lineman, Cable Splicer, Technician	48.36	16.92
21) Heavy Equipment Operator	42.26	6.5% + 19.88
22) Equipment Operator, Tractor Trailer Driver, Material Men	40.96	6.5% + 19.21
23) Driver Groundmen	26.5	6.5% + 9.00
23a) Truck Driver	40.96	6.5% + 17.76

----LINE CONSTRUCTION----

24) Driver Groundmen	30.92	6.5% + 9.70
25) Groundmen	22.67	6.5% + 6.20

As of: January 8, 2024

26) Heavy Equipment Operators	37.1	6.5% + 10.70
27) Linemen, Cable Splicers, Dynamite Men	41.22	6.5% + 12.20
28) Material Men, Tractor Trailer Drivers, Equipment Operators	35.04	6.5% + 10.45

Welders: Rate for craft to which welding is incidental.

**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*

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

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 journeyman 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

As of: January 8, 2024

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.

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

(applicable to public building contracts entered into *on or after July 1, 2007*, where the total cost of all work to be performed is at least \$100,000)

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;
- (6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;
- (7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;
- (8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;
- (9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;

- (10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;
- (11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;
- (12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;
- (13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;
- (14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and
- (15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.
- (16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of <http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm>; or by telephone at (860)263-6790.

THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.



THIS IS A PUBLIC WORKS PROJECT

Covered by the

PREVAILING WAGE LAW

CT General Statutes Section 31-53

**If you have QUESTIONS regarding your wages
CALL (860) 263-6790**

Section 31-55 of the CT State Statutes requires every contractor or subcontractor performing work for the state to post in a prominent place the prevailing wages as determined by the Labor Commissioner.

NOTICE

TO ALL CONTRACTING AGENCIES

Please be advised that Connecticut General Statutes Section 31-53, requires the contracting agency to certify to the Department of Labor, the total dollar amount of work to be done in connection with such public works project, regardless of whether such project consists of one or more contracts.

Please find the attached “Contracting Agency Certification Form” to be completed and returned to the Department of Labor, Wage and Workplace Standards Division, Public Contract Compliance Unit.

Inquiries can be directed to 860.263.6790.



CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

Contracting Agency Certification Form

I, _____, acting in my official capacity as _____,
Authorized Representative Title
for _____, located at _____,
Contracting Agency Address

do hereby certify that the total dollar amount of work to be done in connection with

_____, located at _____,
Project name and number Address

shall be \$_____, which includes all work, regardless of whether such project
contains of one or more contracts.

Contractor Information

Name: _____

Address: _____

Authorized Representative: _____

Approximate Starting Date: _____

Approximate Completion Date: _____

Signature

Date

Return to:

Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

Rate Schedule Issued (Date): _____

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM
Construction Manager at Risk/General Contractor/Prime Contractor

I, _____ of _____
Officer, Owner, Authorized Rep. Company Name

do hereby certify that the _____
Company Name

Street

City

and all of its subcontractors will pay all workers on the

Project Name and Number

Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is attached hereto).

Signed

Subscribed and sworn to before me this _____ day of _____, _____.

Notary Public

Return to:
Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

Rate Schedule Issued (Date): _____

**Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES**

⇒ Please Note: If the “Benefits” listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the “Benefits” section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

- a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

- a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Veterans’ Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.
- b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

- a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators
(Heavy and Highway Construction & Building Construction)

- 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. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

- a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

- a. Paid Holidays: 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.

Roofers

- a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters

- a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers

(Heavy and Highway Construction & Building Construction)

- 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.

Information Bulletin ***Occupational Classifications***

The Connecticut Department of Labor has the responsibility to properly determine "job classification" on prevailing wage projects covered under C.G.S. Section 31-53(d).

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification. If unsure, the employer should seek guidelines for CTDOL.

Below are additional clarifications of specific job duties performed for certain classifications:

- **ASBESTOS WORKERS**

Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

- **ASBESTOS INSULATOR**

Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

- **BOILERMAKERS**

Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

- **BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS**

Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

- **CARPENTERS, MILLWRIGHTS. PILEDRIVERMEN. LATHERS. RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS**

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

- **LABORER, CLEANING**

- The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

- **DELIVERY PERSONNEL**

- If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

- An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer or tradesman, and not a delivery personnel.

- **ELECTRICIANS**

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. ****License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.***

- **ELEVATOR CONSTRUCTORS**

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. **License required by Connecticut General Statutes: R-1,2,5,6.*

- **FORK LIFT OPERATOR**

Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.

Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

- **GLAZIERS**

Glazing wood and metal sash, doors, partitions, and 2 story aluminum storefronts. Installs glass windows, skylights, store fronts and display cases or surfaces such as building fronts, interior walls, ceilings and table tops and metal store fronts. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers, which require equal composite workforce.

- **IRONWORKERS**

Erection, installation and placement of structural steel, precast concrete, miscellaneous iron, ornamental iron, metal curtain wall, rigging and reinforcing steel. Handling, sorting, and installation of reinforcing steel (rebar). Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which require equal composite workforce.

- **INSULATOR**

- Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings.

- **LABORERS**

Acetylene burners, asphalt rakers, chain saw operators, concrete and power buggy operator, concrete saw operator, fence and guard rail erector (except metal bridge rail (traffic), decorative security fence (non-metal).

installation.), hand operated concrete vibrator operator, mason tenders, pipelayers (installation of storm drainage or sewage lines on the street only), pneumatic drill operator, pneumatic gas and electric drill operator, powermen and wagon drill operator, air track operator, block paver, curb setters, blasters, concrete spreaders.

- **PAINTERS**

Maintenance, preparation, cleaning, blasting (water and sand, etc.), painting or application of any protective coatings of every description on all bridges and appurtenances of highways, roadways, and railroads. Painting, decorating, hardwood finishing, paper hanging, sign writing, scenic art work and drywall hhg for any and all types of building and residential work.

- **LEAD PAINT REMOVAL**

- Painter's Rate

1. Removal of lead paint from bridges.
2. Removal of lead paint as preparation of any surface to be repainted.
3. Where removal is on a Demolition project prior to reconstruction.

- Laborer's Rate

1. Removal of lead paint from any surface NOT to be repainted.
2. Where removal is on a *TOTAL* Demolition project only.

- **PLUMBERS AND PIPEFITTERS**

Installation, repair, replacement, alteration or maintenance of all plumbing, heating, cooling and piping. ****License required per Connecticut General Statutes: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.***

- **POWER EQUIPMENT OPERATORS**

Operates several types of power construction equipment such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and maintains equipment. ****License required, crane operators only, per Connecticut General Statutes.***

- **ROOFERS**

Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and gravel to waterproof roofs, including preparation of surface. (demolition or removal of any type of roofing and or clean-up of any and all areas where a roof is to be relaid.)

- **SHEETMETAL WORKERS**

Fabricate, assembles, installs and repairs sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters. Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, fascia, louvers, partitions, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers. To include testing and air –balancing ancillary to installation and construction.

- **SPRINKLER FITTERS**

Installation, alteration, maintenance and repair of fire protection sprinkler systems.

****License required per Connecticut General Statutes: F-1,2,3,4.***

- **TILE MARBLE AND TERRAZZO FINISHERS**

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

- **TRUCK DRIVERS**

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are required to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. ****License required, drivers only, per Connecticut General Statutes.***

For example:

- Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
- Hauling material off site is not covered provided they are not dumping it at a location outlined above.
- Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

➤ *Any questions regarding the proper classification should be directed to:*
Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6790.

[New] In accordance with Section 31-53b(a) of the C.G.S. each contractor shall provide a copy of the OSHA 10 Hour Construction Safety and Health Card for each employee, to be attached to the first certified payroll on the project.

PAYROLL CERTIFICATION FOR PUBLIC WORKS PROJECTS

WEEKLY PAYROLL

Connecticut Department of Labor
Wage and Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

In accordance with Connecticut General Statutes, 31-53 Certified Payrolls with a statement of compliance shall be submitted monthly to the contracting agency.

CONTRACTOR NAME AND ADDRESS:											SUBCONTRACTOR NAME & ADDRESS				WORKER'S COMPENSATION INSURANCE CARRIER					
PAYROLL NUMBER	Week-Ending Date	PROJECT NAME & ADDRESS									POLICY #				EFFECTIVE DATE:		EXPIRATION DATE:			
PERSON/WORKER, ADDRESS and SECTION	APPR RATE %	MALE/FEMALE AND RACE*	WORK CLASSIFICATION	DAY AND DATE						Total ST Hours	BASE HOURLY RATE	TYPE OF FRINGE BENEFITS Per Hour 1 through 6 (see back)	GROSS PAY FOR ALL WORK PERFORMED THIS WEEK	TOTAL DEDUCTIONS				GROSS PAY FOR THIS PREVAILING RATE JOB	CHECK # AND NET PAY	
				S	M	T	W	TH	F	S				Total O/T Hours	FICA	FEDERAL WITH-HOLDING	STATE WITH-HOLDING			LIST OTHER
			Trade License Type & Number - OSHA 10 Certification Number	HOURS WORKED EACH DAY																
												\$	1. \$							
												Base Rate	2. \$							
													3. \$							
													4. \$							
												\$	5. \$							
												Cash Fringe	6. \$							
												\$	1. \$							
												Base Rate	2. \$							
													3. \$							
													4. \$							
												\$	5. \$							
												Cash Fringe	6. \$							

***FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker’s compensation, income taxes, etc.).

Please specify the type of benefits provided:

- 1) Medical or hospital care _____ 4) Disability _____
- 2) Pension or retirement _____ 5) Vacation, holiday _____
- 3) Life Insurance _____ 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of _____,

I, _____ of _____, (hereafter known as Employer) in my capacity as _____ (title) do hereby certify and state:

Section A:

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

- a) The records submitted are true and accurate;
- b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;
- c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);
- d) Each such person is covered by a worker’s compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;
- e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and
- f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA~The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such persons name first appears.

_____ (Signature) _____ (Title) _____ Submitted on (Date)

STATUTE 31-55a

- SPECIAL NOTICE -

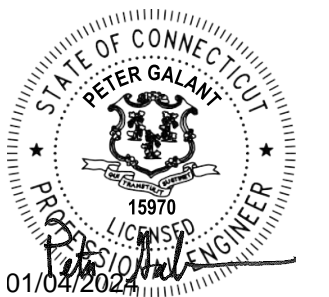
To: All State and Political Subdivisions, Their Agents, and Contractors

Connecticut General Statute 31-55a - Annual adjustments to wage rates by contractors doing state work.

Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54 of the general statutes, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.

- The prevailing wage rates applicable to any contract or subcontract awarded on or after October 1, 2002 are subject to annual adjustments each July 1st for the duration of any project which was originally advertised for bids on or after October 1, 2002.
- Each contractor affected by the above requirement 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 Web Site. The annual adjustments will be posted on the Department of Labor Web page: www.ctdol.state.ct.us. 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.

Any questions should be directed to the Contract Compliance Unit, Wage and Workplace Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd., Wethersfield, CT 06109 at (860)263-6790.



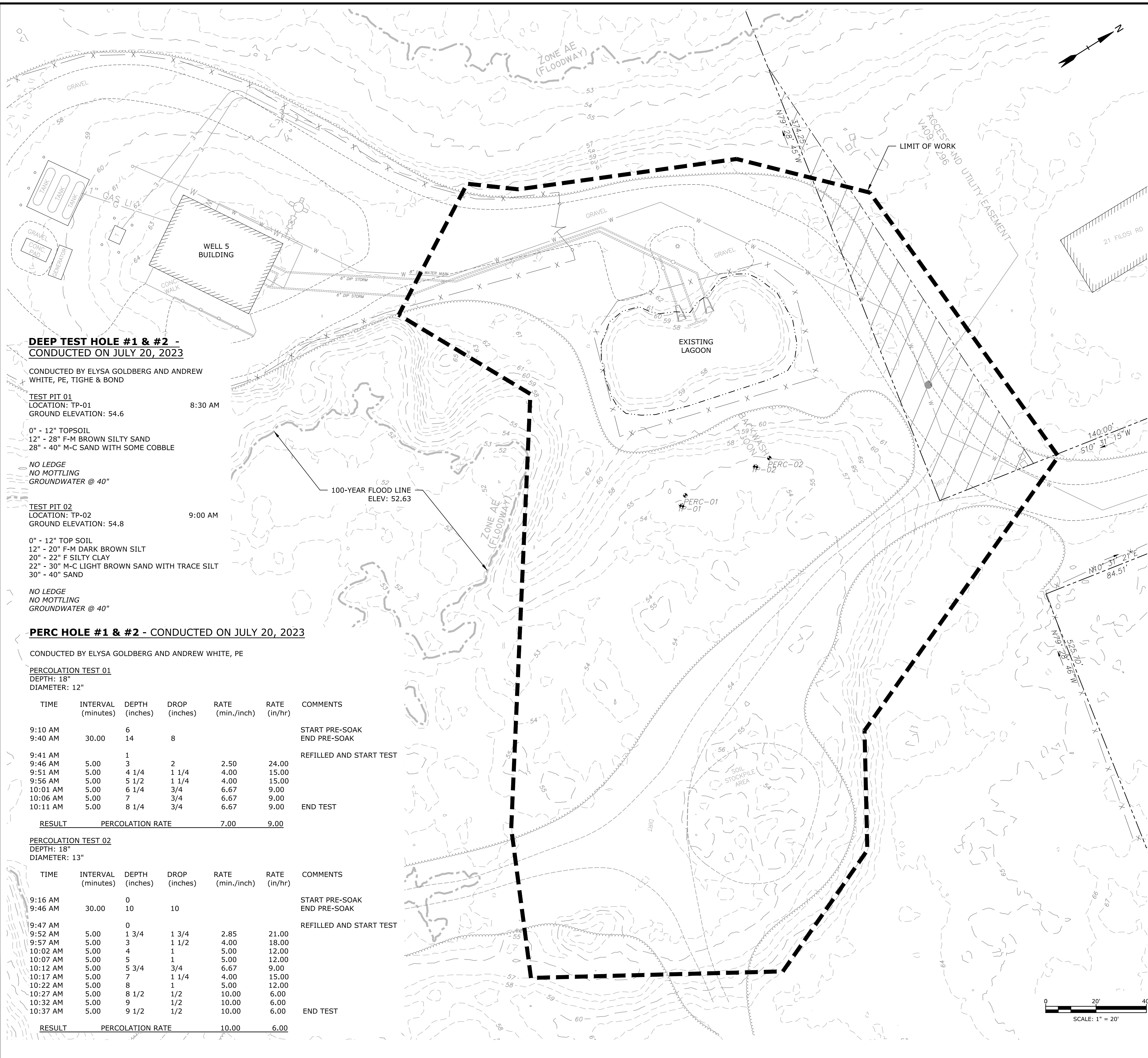
EXISTING CONDITIONS NOTES

- THIS PROJECT IS BEING PERFORMED IN AN ACTIVE PUBLIC WATER SUPPLY WELL RECHARGE AREA. TAKE ALL NECESSARY MEASURES TO PROTECT GROUNDWATER QUALITY INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:
 - PETROLEUM PRODUCTS, SOLVENTS OR CONSTRUCTION CHEMICALS SHALL NOT BE STORED ON-SITE.
 - VEHICLE EQUIPMENT MAINTENANCE AND REFUELING SHALL BE PERFORMED OFF SITE TO THE EXTENT FEASIBLE AND PROHIBITED WITHIN 200 FEET OF ANY WELL.
 - USE OF HERBICIDES OR PESTICIDES, OR SEED MIXES CONTAINING THESE PRODUCTS, SHALL BE PROHIBITED.
 - SPILL CONTAINMENT MATERIAL SHALL BE AVAILABLE ONSITE.
 - ANY SPILL OR RELEASE OF HAZARDOUS MATERIAL SHALL IMMEDIATELY BE REPORTED TO THE OWNER.
- UTILITY, STRUCTURE AND FACILITY LOCATIONS SHOWN HEREON WERE PLOTTED FROM INFORMATION SUPPLIED BY RESPECTIVE UTILITY COMPANIES AND DATA OBTAINED FROM FIELD SURVEYS AND AS-BUILT DRAWINGS. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION SHOWN ON THESE DRAWINGS IS NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL UTILITIES WHICH MAY AFFECT CONSTRUCTION OPERATIONS. THE CONTRACTOR MUST ADEQUATELY PROTECT AND SUPPORT UTILITIES AND SHALL BE RESPONSIBLE FOR ALL DAMAGE INCURRED AT NO EXPENSE TO THE OWNER. ANYONE USING UTILITY INFORMATION AND DATA PROVIDED HEREIN SHALL CONTACT "CALL BEFORE YOU DIG", 1-800-922-4455 OR WWW.CBYD.COM, 72 HOURS IN ADVANCE TO VERIFY THE LOCATION OF UTILITIES PRIOR TO STARTING CONSTRUCTION.
- REFERENCE IS MADE TO KEYES SITE PLAN AND DETAILS FOR WELL PUMPING STATION NO.5, DATED SEPTEMBER 1990.
- REFERENCE IS MADE TO NEAR MAPS AERIAL IMAGE, DATED APRIL 10, 2023.
- REFERENCE IS MADE TO CT ECO LIDAR MAPPING, DATED 2016.
- ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988.
- REFERENCE IS MADE TO DRAWING ENTITLED "PROPOSED REPLACEMENT WELL 5A" AS PREPARED BY THE EAST LYME ENGINEERING DEPARTMENT, DATED JULY 2021.
- IT IS THE RESPONSIBILITY OF EACH BIDDER IN EVALUATING THESE PLANS TO MAKE EXAMINATIONS IN THE FIELD BY VARIOUS METHODS AND OBTAIN NECESSARY INFORMATION FROM AVAILABLE RECORDS, UTILITY COMPANIES, AND INDIVIDUALS AS TO THE LOCATION OF SUBSURFACE STRUCTURES.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THIS PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE DRAWINGS, SPECIFICATIONS OR APPLICABLE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNER IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE OWNER SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL CONFORMANCE WITH LOCAL REGULATIONS AND CODES.

EXISTING CONDITIONS LEGEND

PROJECT LIMIT LINE	
PROPERTY LINE	
MINOR CONTOUR	
MAJOR CONTOUR	
SPOT ELEVATION	
WETLAND FLAGS	
WETLAND BOUNDARY	
TREES	
TREE LINE	
BUILDING	
FENCE LINE	
EDGE OF GRAVEL	
STORM SEWER	
WATER VALVE	
HYDRANT	
WATER MAIN	
OVERHEAD WIRES	
UTILITY POLE	
APPROXIMATE TEST PIT LOCATION	
APPROXIMATE PERCOLATION TEST LOCATION	
100' UPLAND REVIEW AREA	
100-YEAR FLOODPLAIN*	

*NOTE: 100 YEAR FLOOD PLAIN IS BASED ON FEMA PATTAGANSETT RIVER PROFILE



DEEP TEST HOLE #1 & #2 - CONDUCTED ON JULY 20, 2023

CONDUCTED BY ELYSA GOLDBERG AND ANDREW WHITE, PE, TIGHE & BOND

TEST PIT 01
 LOCATION: TP-01
 GROUND ELEVATION: 54.6
 8:30 AM
 0" - 12" TOPSOIL
 12" - 28" F-M BROWN SILTY SAND
 28" - 40" M-C SAND WITH SOME COBBLE

NO LEDGE
 NO MOTTLING
 GROUNDWATER @ 40"

TEST PIT 02
 LOCATION: TP-02
 GROUND ELEVATION: 54.8
 9:00 AM
 0" - 12" TOP SOIL
 12" - 20" F-M DARK BROWN SILT
 20" - 22" F SILTY CLAY
 22" - 30" M-C LIGHT BROWN SAND WITH TRACE SILT
 30" - 40" SAND

NO LEDGE
 NO MOTTLING
 GROUNDWATER @ 40"

PERC HOLE #1 & #2 - CONDUCTED ON JULY 20, 2023

CONDUCTED BY ELYSA GOLDBERG AND ANDREW WHITE, PE

PERCOLATION TEST 01
 DEPTH: 18"
 DIAMETER: 12"

TIME	INTERVAL (minutes)	DEPTH (inches)	DROP (inches)	RATE (min./inch)	RATE (in/hr)	COMMENTS
9:10 AM		6				START PRE-SOAK
9:40 AM	30.00	14	8			END PRE-SOAK
9:41 AM		1				REFILLED AND START TEST
9:46 AM	5.00	3	2	2.50	24.00	
9:51 AM	5.00	4 1/4	1 1/4	4.00	15.00	
9:56 AM	5.00	5 1/2	1 1/4	4.00	15.00	
10:01 AM	5.00	6 1/4	3/4	6.67	9.00	
10:06 AM	5.00	7	3/4	6.67	9.00	
10:11 AM	5.00	8 1/4	3/4	6.67	9.00	END TEST
RESULT		PERCOLATION RATE		7.00	9.00	

PERCOLATION TEST 02
 DEPTH: 18"
 DIAMETER: 13"

TIME	INTERVAL (minutes)	DEPTH (inches)	DROP (inches)	RATE (min./inch)	RATE (in/hr)	COMMENTS
9:16 AM		0				START PRE-SOAK
9:46 AM	30.00	10	10			END PRE-SOAK
9:47 AM		0				REFILLED AND START TEST
9:52 AM	5.00	1 3/4	1 3/4	2.85	21.00	
9:57 AM	5.00	3	1 1/2	4.00	18.00	
10:02 AM	5.00	4	1	5.00	12.00	
10:07 AM	5.00	5	1	5.00	12.00	
10:12 AM	5.00	5 3/4	3/4	6.67	9.00	
10:17 AM	5.00	7	1 1/4	4.00	15.00	
10:22 AM	5.00	8	1	5.00	12.00	
10:27 AM	5.00	8 1/2	1/2	10.00	6.00	
10:32 AM	5.00	9	1/2	10.00	6.00	
10:37 AM	5.00	9 1/2	1/2	10.00	6.00	END TEST
RESULT		PERCOLATION RATE		10.00	6.00	

Last Saved: 1/2/2024
 Plotted On: Jan 03, 2024 1:13pm By: APW
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 Well 5 WTP Lagoons\Drawings\AutoCAD\Sheet\100-034-C-100-EXCN.dwg

East Lyme Well 5 Lagoon Expansion

Town of East Lyme Water and Sewer Commission

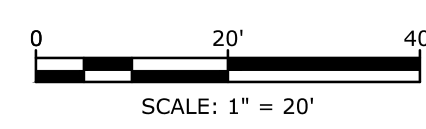
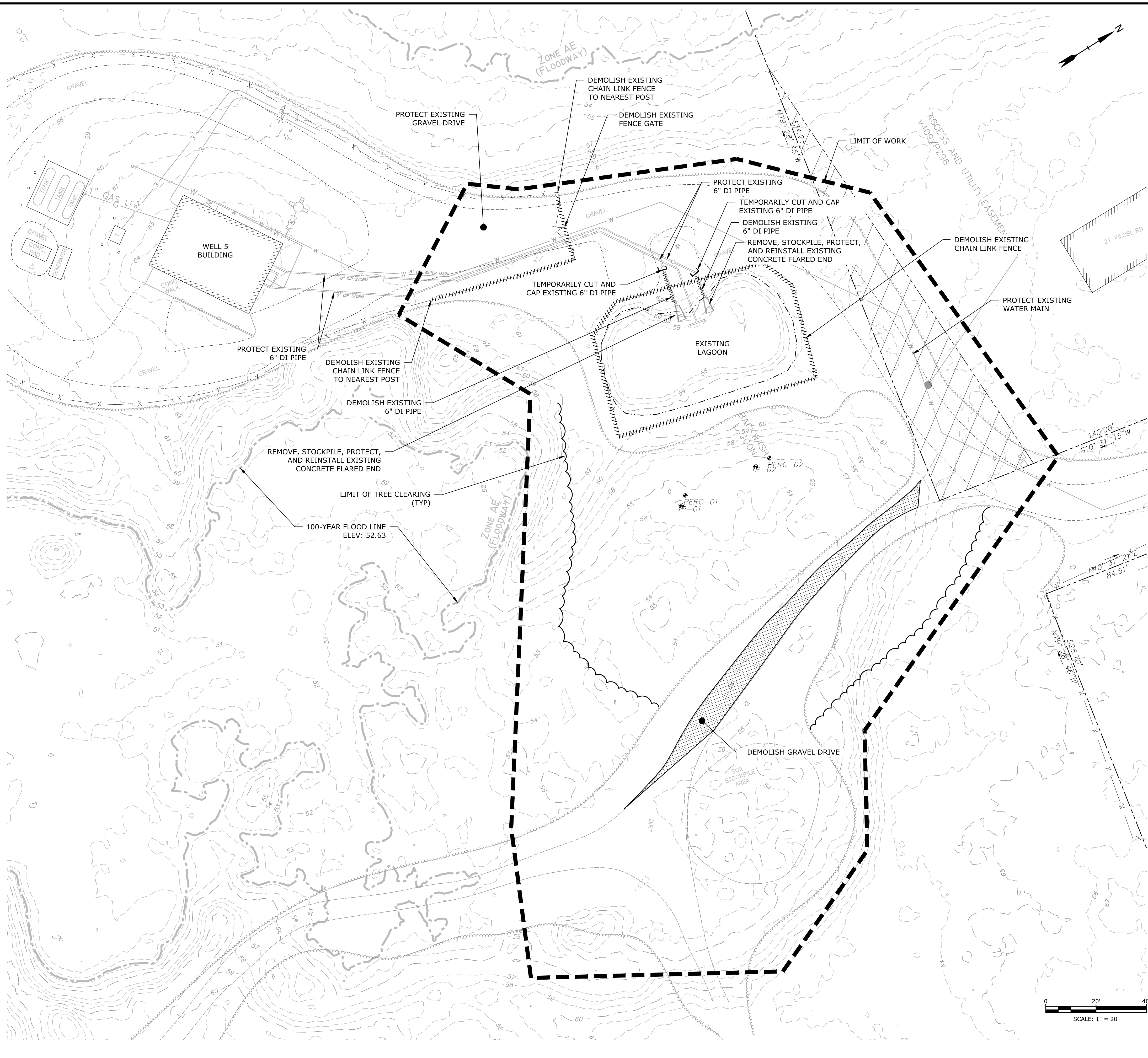
East Lyme, CT

MARK	DATE	DESCRIPTION
PROJECT NO:	E0610-034	
DATE:	JANUARY 2024	
FILE:	E0610-034-C-100-EXCN.dwg	
DRAWN BY:	ZNH	
DESIGNED/CHECKED BY:	APW	
APPROVED BY:	PBG	

EXISTING CONDITIONS PLAN

SCALE: AS SHOWN

Last Saved: 1/2/2024
 Plotted On: Jan 03, 2024 1:13pm By: APW
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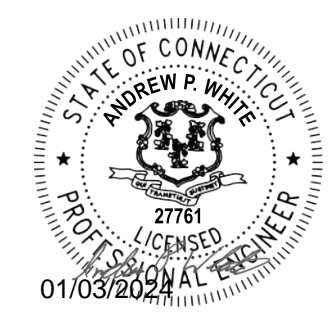
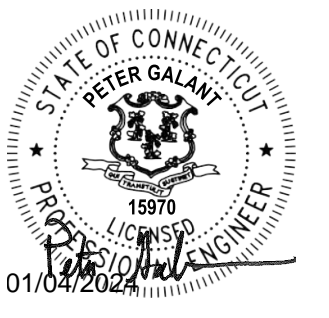


SITE DEMOLITION NOTES

1. UTILITY, STRUCTURE AND FACILITY LOCATIONS SHOWN HEREON WERE PLOTTED FROM INFORMATION SUPPLIED BY RESPECTIVE UTILITY COMPANIES AND DATA OBTAINED FROM FIELD SURVEYS AND AS-BUILT DRAWINGS. THE ACCURACY AND COMPLETENESS OF SUBSURFACE INFORMATION SHOWN ON THESE DRAWINGS IS NOT GUARANTEED. THE CONTRACTOR SHALL DETERMINE THE LOCATIONS AND ELEVATIONS OF ALL UTILITIES WHICH MAY AFFECT CONSTRUCTION OPERATIONS. THE CONTRACTOR MUST ADEQUATELY PROTECT AND SUPPORT UTILITIES AND SHALL BE RESPONSIBLE FOR ALL DAMAGE INCURRED AT NO EXPENSE TO THE OWNER. ANYONE USING UTILITY INFORMATION AND DATA PROVIDED HEREIN SHALL CONTACT "CALL BEFORE YOU DIG", 1-800-922-4455 OR WWW.CBYD.COM, 72 HOURS IN ADVANCE TO VERIFY THE LOCATION OF UTILITIES PRIOR TO STARTING CONSTRUCTION.
2. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FROM THE TOWN OF EAST LYME PRIOR TO ANY WORK BEING PERFORMED WITHIN TOWN RIGHT-OF-WAY.
3. ANY AND ALL WORK PERFORMED WITHIN THE TOWN OF EAST LYME RIGHT-OF-WAY SHALL BE REQUIRED TO MEET THE TOWN STANDARDS.
4. THE CONTRACTOR SHALL TAKE EXTREME CARE TO PROTECT ALL EXISTING STRUCTURES, SURFACE IMPROVEMENTS, LANDSCAPING, ETC. OUTSIDE THE PROJECT LIMIT LINE AND SHALL RESTORE ANY DAMAGE TO THESE ITEMS TO PRE-DAMAGE CONDITION OR BETTER.
5. CONTRACTOR TO DEMOLISH, REMOVE, AND LEGALLY DISPOSE OF MISCELLANEOUS POLES, BIT CONC PAVEMENT, CONCRETE WALK, CURBING, PAVERS, LANDSCAPING, UTILITY PIPING, ETC. AND ALL ITEMS INDICATED TO BE REMOVED WITHIN THE PROJECT LIMIT LINE.
6. THE CONTRACTOR SHALL PROTECT EXISTING UTILITY STRUCTURES NOT IDENTIFIED FOR REMOVAL DURING UTILITY AND SURFACE DEMOLITION OPERATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED TO EXISTING UTILITY STRUCTURES AND SHALL REPAIR OR REPLACE THE EXISTING UTILITY STRUCTURES TO PRE-DAMAGED CONDITION OR BETTER TO THE SATISFACTION OF THE OWNER AND AT NO ADDITIONAL COST TO THE OWNER.
7. THE PLAN IS PROVIDED TO SHOW THE GENERAL EXTENT OF THE SITE UTILITY REMOVAL AND DEMOLITION. NOT ALL ITEMS REQUIRING REMOVAL MAY BE SHOWN OR CALLED OUT. THE CONTRACTOR IS RESPONSIBLE TO REMOVE AND PROPERLY DISPOSE OF ALL ITEMS ON THE SITE (ABOVE GROUND OR BELOW GROUND) WHICH ARE NOT REQUIRED TO BE SAVED OR PROTECTED AND WHICH WILL NOT BE INCORPORATED INTO THE FINAL CONSTRUCTION.
8. THE PROVISIONS OF WORKER SAFETY AND/OR HEALTH PROTOCOLS THAT ADDRESS COMPLIANCE WITH THE RULES, LAWS AND REGULATIONS PERTAINING TO CONSTRUCTION SAFETY AND/OR THE POTENTIAL AND/OR ACTUAL RISK OF EXPOSURE TO SITE SPECIFIC PHYSICAL OR CHEMICAL HAZARDS POSED TO THE CONTRACTOR'S EMPLOYEES IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. REFER TO APPLICABLE HEALTH AND SAFETY SPECIFICATIONS.
9. PRIOR TO DEMOLITION WORK OF ANY UTILITY COMPANY, THE CONTRACTOR SHALL CONTACT THE RESPECTIVE UTILITY COMPANY. THE CONTRACTOR SHALL COORDINATE ANY REMOVAL OF EXISTING UTILITIES WITH THE RESPECTIVE UTILITY COMPANY.
10. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES NOT IDENTIFIED FOR REMOVAL OR ABANDONMENT. COORDINATE REMOVAL LIMITS AND SEQUENCE WITH PROPOSED UTILITY WORK.
11. ALL ITEMS IDENTIFIED FOR REMOVAL/DEMOLITION SHALL BE DISPOSED OF LEGALLY OFF-SITE.
12. CONTRACTOR TO COMPLY WITH THE REQUIREMENTS FOR EROSION AND SEDIMENTATION CONTROL.
13. THE CONTRACTOR SHALL MAINTAIN EXISTING STORM SEWER FLOWS BY PUMPING OR OTHER MEANS APPROVED BY THE OWNER'S REPRESENTATIVE DURING CONSTRUCTION OF THE PROPOSED STORM SEWER IN LOCATIONS WHERE STORM SEWER ARE BEING INSTALLED, REPLACED OR RELOCATED.
14. CONTRACTOR TO COORDINATE ALL REMOVALS WITH THE TOWN OF EAST LYME PRIOR TO DEMOLITION.

LEGEND

- DEMOLISH EXISTING GRAVEL
- DEMOLISH EXISTING UTILITY STRUCTURE/TREE
- ABANDON STRUCTURE
- CUT AND CAP PIPE
- PROJECT LIMIT LINE
- 100-YEAR FLOODPLAIN
- DEMOLISH EXISTING UTILITY PIPE
- DEMOLISH EXISTING FENCE
- LIMIT OF TREE CLEARING



East Lyme Well 5 Lagoon Expansion

Town of East Lyme Water and Sewer Commission

East Lyme, CT

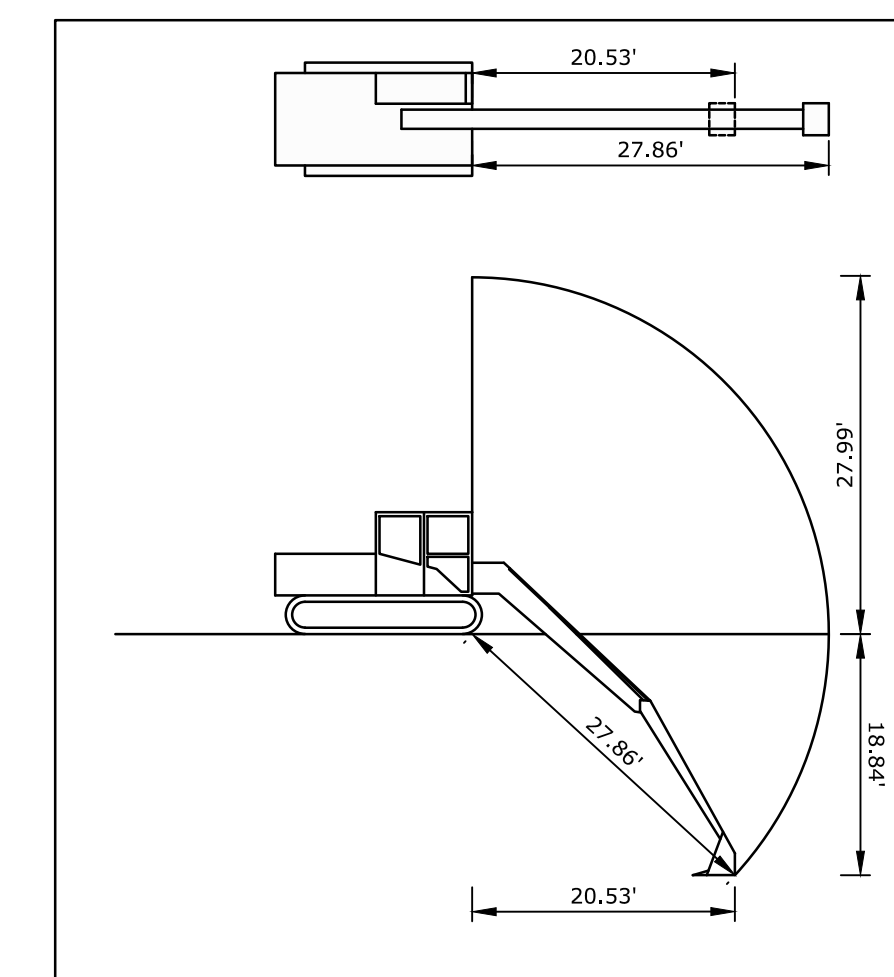
MARK	DATE	DESCRIPTION
PROJECT NO:	E0610-034	
DATE:	JANUARY 2024	
FILE:	E0610-034-C-201-DEMO.dwg	
DRAWN BY:	EG	
DESIGNED/CHECKED BY:	APW	
APPROVED BY:	PBG	

SITE DEMOLITION PLAN

SCALE: AS SHOWN

SITE PLAN NOTES

1. UNDERGROUND UTILITY, STRUCTURE AND FACILITY LOCATIONS DEPICTED HEREON HAVE BEEN COMPILED, IN PART, FROM RECORD MAPPING AND OTHER DATA SUPPLIED BY THE RESPECTIVE UTILITY COMPANIES, GOVERNMENTAL AGENCIES AND/OR OTHER SOURCES. THESE LOCATIONS MUST BE CONSIDERED APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH DATA MAY EXIST ON SITE, THE EXISTENCE OF WHICH ARE UNKNOWN TO TIGHE & BOND. THE EXISTENCE, SIZE AND LOCATION OF ALL SUCH FEATURES MUST BE DETERMINED AND VERIFIED IN THE FIELD BY APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION @ CALL-BEFORE-YOU-DIG 1-800-922-4455.
2. REFERENCE IS MADE TO KEYES SITE PLAN AND DETAILS FOR WELL PUMPING STATION NO.5, DATED SEPTEMBER 1990.
3. REFERENCE IS MADE TO NEAR MAPS AERIAL IMAGE, DATED APRIL 10, 2023.
4. REFERENCE IS MADE TO CT ECO LIDAR MAPPING, DATED 2016.
5. REFERENCE IS MADE TO DRAWING ENTITLED "PROPOSED REPLACEMENT WELL 5A" AS PREPARED BY THE EAST LYME ENGINEERING DEPARTMENT, DATED JULY 2021.
6. ANY AREAS DISTURBED BY CONSTRUCTION ACTIVITIES AND IS NOT PROVIDED WITH A SPECIFIC SITE IMPROVEMENT (PAVING, SIDEWALK, LANDSCAPING, ETC.) SHALL HAVE 4" TOPSOIL AND TURF ESTABLISHMENT IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
7. CONTRACTOR SHALL PROCURE A QUALIFIED SURVEYOR LICENSED IN THE STATE OF CONNECTICUT TO ESTABLISH AND RECORD ALL SITE LAYOUT WORK INCLUDING GRADES, LINES, AND ELEVATIONS.
8. THE GENERAL CONTRACTOR SHALL FORWARD A LETTER FROM HIS LAND SURVEYOR OR PROFESSIONAL ENGINEER STATING THAT THE CONTROL INFORMATION FURNISHED BY THE OWNER IS ACCURATE OR SHALL IDENTIFY INACCURACIES, IF THEY EXIST. THE GENERAL CONTRACTOR SHALL NOT TAKE ADVANTAGE OF ERRORS, WHICH MAY BE INCLUDED IN THE CONTROL INFORMATION. STAKES AND MARKINGS SHALL BE PRESERVED.
9. THE LOCATIONS OF ITEMS NOT DIMENSIONED ON THE DRAWINGS SHALL BE FIELD STAKED BY THE CONTRACTOR AND THEIR LOCATIONS APPROVED BY THE TOWN OF EAST LYME PRIOR TO INSTALLATION.



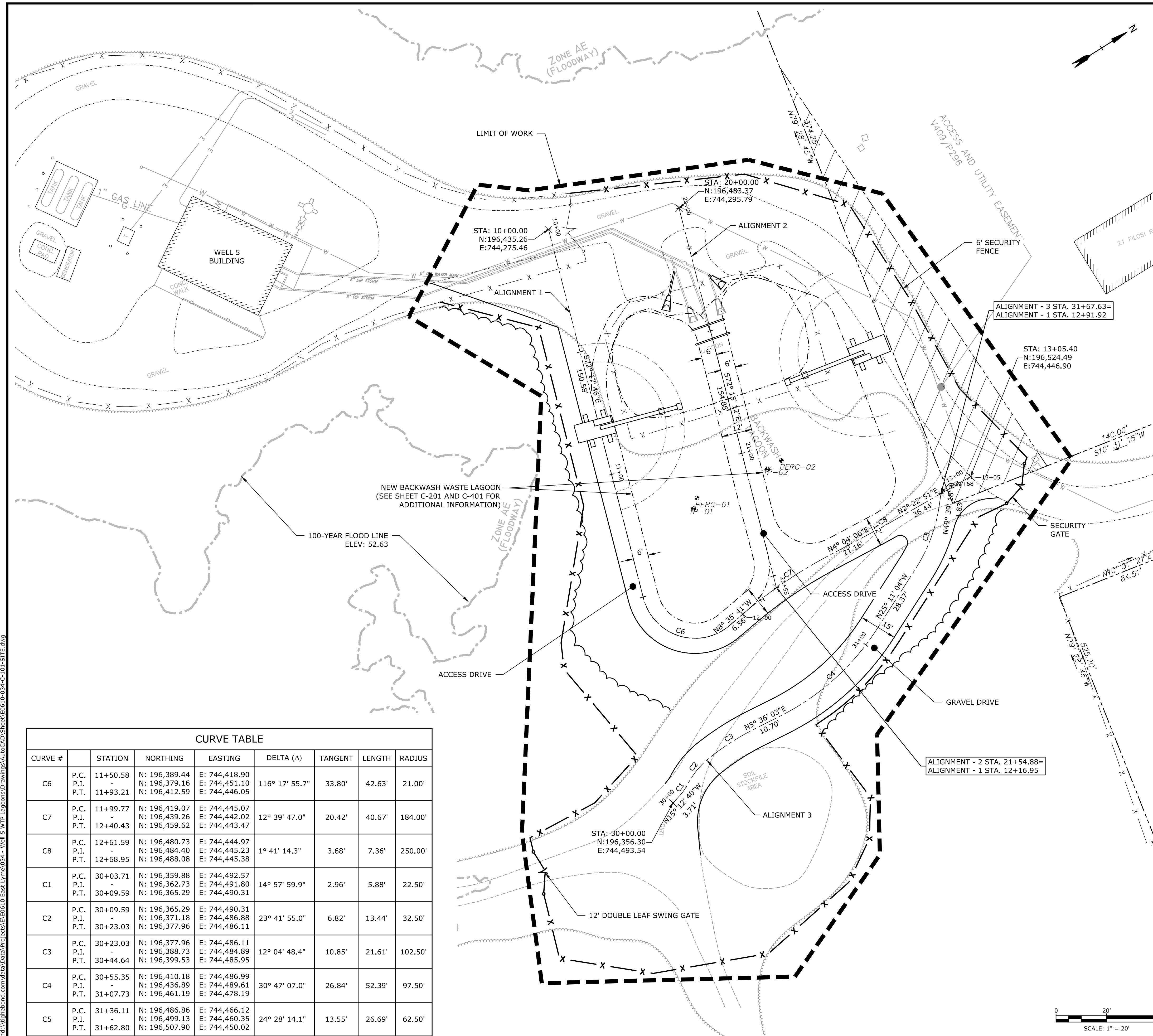
VOLVO EC160-CL EXCAVATOR

EXISTING LAAGOON VOLUME = 15,508 CF
PROPOSED TOTAL VOLUME = 40,418 CF
NORTHERN CELL VOLUME = 20,083 CF
SOUTHERN CELL VOLUME = 20,335 CF

SITE PLAN LEGEND

- PROJECT LIMIT LINE
- PROPERTY LINE
- SETBACK LINE
- 100-YEAR FLOOD PLAIN*
- FLARED END
- OVERHEAD WIRES
- UTILITY POLE
- EDGE OF GRAVEL
- BACKWASH WASTE LAAGOON

*NOTE: 100 YEAR FLOOD PLAIN IS BASED ON FEMA PATTAGANSETT RIVER PROFILE



CURVE TABLE								
CURVE #		STATION	NORTHING	EASTING	DELTA (Δ)	TANGENT	LENGTH	RADIUS
C6	P.C.	11+50.58	N: 196,389.44	E: 744,418.90	116° 17' 55.7"	33.80'	42.63'	21.00'
	P.I.	-	N: 196,379.16	E: 744,451.10				
	P.T.	11+93.21	N: 196,412.59	E: 744,446.05				
C7	P.C.	11+99.77	N: 196,419.07	E: 744,445.07	12° 39' 47.0"	20.42'	40.67'	184.00'
	P.I.	-	N: 196,439.26	E: 744,442.02				
	P.T.	12+40.43	N: 196,459.62	E: 744,443.47				
C8	P.C.	12+61.59	N: 196,480.73	E: 744,444.97	1° 41' 14.3"	3.68'	7.36'	250.00'
	P.I.	-	N: 196,484.40	E: 744,445.23				
	P.T.	12+68.95	N: 196,488.08	E: 744,445.38				
C1	P.C.	30+03.71	N: 196,359.88	E: 744,492.57	14° 57' 59.9"	2.96'	5.88'	22.50'
	P.I.	-	N: 196,362.73	E: 744,491.80				
	P.T.	30+09.59	N: 196,365.29	E: 744,490.31				
C2	P.C.	30+09.59	N: 196,365.29	E: 744,490.31	23° 41' 55.0"	6.82'	13.44'	32.50'
	P.I.	-	N: 196,371.18	E: 744,486.88				
	P.T.	30+23.03	N: 196,377.96	E: 744,486.11				
C3	P.C.	30+23.03	N: 196,377.96	E: 744,486.11	12° 04' 48.4"	10.85'	21.61'	102.50'
	P.I.	-	N: 196,388.73	E: 744,484.89				
	P.T.	30+44.64	N: 196,399.53	E: 744,485.95				
C4	P.C.	30+55.35	N: 196,410.18	E: 744,486.99	30° 47' 07.0"	26.84'	52.39'	97.50'
	P.I.	-	N: 196,436.89	E: 744,489.61				
	P.T.	31+07.73	N: 196,461.19	E: 744,478.19				
C5	P.C.	31+36.11	N: 196,486.86	E: 744,466.12	24° 28' 14.1"	13.55'	26.69'	62.50'
	P.I.	-	N: 196,499.13	E: 744,460.35				
	P.T.	31+62.80	N: 196,507.90	E: 744,450.02				



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 Plotted On: Jan 03, 2024 1:31pm By: APW
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East Lyme Well 5 Lagoon Expansion

Town of East Lyme Water and Sewer Commission

East Lyme, CT

MARK	DATE	DESCRIPTION
PROJECT NO:	E0610-034	
DATE:	JANUARY 2024	
FILE:	E0610-034-C-101-SITE.dwg	
DRAWN BY:	EG	
DESIGNED/CHECKED BY:	APW	
APPROVED BY:	PBG	

SITE PLAN

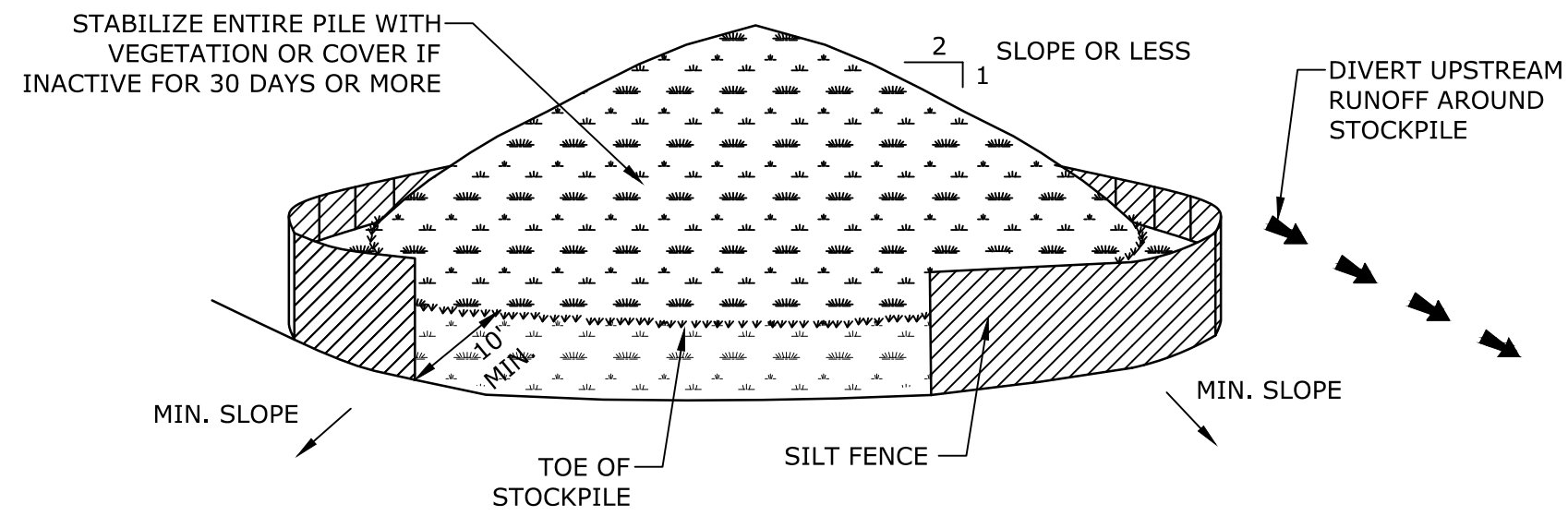
SCALE: AS SHOWN

SOIL EROSION AND SEDIMENTATION CONTROL NOTES

1. UNDERGROUND UTILITIES, STRUCTURES AND FACILITY LOCATIONS DEPICTED HEREON HAVE BEEN COMPILED, IN PART, FROM RECORD MAPPING AND OTHER DATA SUPPLIED BY THE RESPECTIVE UTILITY COMPANIES, GOVERNMENTAL AGENCIES AND/OR OTHER SOURCES. THESE LOCATIONS MUST BE CONSIDERED APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH DATA MAY EXIST ON SITE, THE EXISTENCE OF WHICH ARE UNKNOWN TO TIGHE & BOND. THE EXISTENCE, SIZE AND LOCATION OF ALL SUCH FEATURES MUST BE DETERMINED AND VERIFIED IN THE FIELD BY APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION @ CALL-BEFORE-YOU-DIG 1-800-922-4455.
2. CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" (1-800-922-4455) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION OPERATION.
3. REFERENCE IS MADE TO KEYES SITE PLAN AND DETAILS FOR WELL PUMPING STATION NO.5, DATED SEPTEMBER 1990.
4. ALL SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE "2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL" DEEP BULLETIN NO 34, AND ALL AMENDMENTS AND ADDENDA THERETO AS PUBLISHED BY THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION.
5. LAND DISTURBANCE SHALL BE KEPT TO THE MINIMUM NECESSARY FOR CONSTRUCTION.
6. ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND ELSEWHERE AS ORDERED BY THE TOWN OF EAST LYME.
7. ALL CATCH BASINS SHALL BE PROTECTED WITH SILT SACKS, HAYBALE RING, SILT FENCE OR BLOCK AND STONE INLET PROTECTION THROUGHOUT THE CONSTRUCTION PERIOD AND UNTIL ALL DISTURBED AREAS ARE THOROUGHLY STABILIZED.
8. WHEREVER POSSIBLE, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO CONSTRUCTION.
9. ADDITIONAL CONTROL MEASURES SHALL BE INSTALLED DURING CONSTRUCTION PERIOD AS ORDERED BY THE TOWN OF EAST LYME.
10. ALL SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE MAINTAINED IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD.
11. SEDIMENT REMOVED SHALL BE DISPOSED OF LEGALLY OFFSITE.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION AND MAINTENANCE OF ALL EROSION CONTROL MEASURES THROUGHOUT THE CONSTRUCTION PERIOD.
13. THE CONTRACTOR SHALL MAINTAIN A SUPPLY OF SILT FENCE/HAYBALES AND ANTI-TRACKING CRUSHED STONE ON-SITE FOR EMERGENCY REPAIRS.
14. THE CONTRACTOR SHALL UTILIZE APPROVED METHODS/MATERIALS FOR PREVENTING THE BLOWING AND MOVEMENT OF DUST FROM EXPOSED SOIL SURFACES ONTO ADJACENT PROPERTIES AND SITE AREAS.
15. ALL DRAINAGE STRUCTURES SHALL BE INSPECTED WEEKLY BY THE CONTRACTOR AND CLEANED TO PREVENT THE BUILD-UP OF SILT.
16. THE CONTRACTOR SHALL CAREFULLY COORDINATE THE PLACEMENT OF EROSION CONTROL MEASURES WITH THE PHASING OF CONSTRUCTION.
17. KEEP ALL PAVED ROADWAYS CLEAN. SWEEP BEFORE FORECASTED STORMS OR WEEKLY AS NECESSARY.
18. TREAT ALL UNPAVED SURFACES WITH 4" MINIMUM OF TOPSOIL AND SEEDING PRIOR TO FINAL STABILIZATION.
19. STRAW WATTLE BARRIERS AND SILT FENCING SHALL BE INSTALLED ALONG THE TOE OF CRITICAL CUT AND FILL SLOPES AS SHOWN ON THE PLANS AND AS DIRECTED BY THE TOWN OF EAST LYME.
20. ALL TRUCKS LEAVING THE SITE MUST BE COVERED.
21. DISTURBED SLOPES SHALL BE TREATED WITH AN EROSION CONTROL SLURRY CONSISTING OF A MIXTURE OF WOOD FIBER MULCH, PLANT SEED AND 3 GALLONS/ACRE OF SILT STOP 640 LIQUID FLOCCULENT. THE FLOCCULENT IS PROVIDED BY HYDROGRASS TECHNOLOGIES, OXFORD MASSACHUSETTS
22. ALL SEDIMENTATION AND EROSION CONTROLS SHALL BE CHECKED WEEKLY AND AFTER EACH RAINFALL EVENT. NECESSARY REPAIRS SHALL BE MADE WITHOUT DELAY.
23. PRIOR TO ANY FORECASTED RAINFALL, EROSION AND SEDIMENT CONTROLS SHALL BE INSPECTED AND REPAIRED AS NECESSARY.
24. AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED, EROSION CONTROLS MAY BE REMOVED ONCE AUTHORIZATION TO DO SO HAS BEEN SECURED FROM THE TOWN OF EAST LYME. DISTURBED AREAS SHALL BE SEEDED AND MULCHED.
25. ALL EMBANKMENT SLOPES 3:1 OR GREATER TO BE STABILIZED WITH EROSION CONTROL BLANKET, NORTH AMERICAN GREEN SC150BN OR APPROVED EQUIVALENT, UNLESS OTHERWISE NOTED ON THE PLANS.
26. ALL DRAINAGE SWALES SHALL BE STABILIZED WITH EROSION CONTROL BLANKET, NORTH AMERICAN GREEN C125BN OR APPROVED EQUIVALENT.

FLOODPLAIN NOTES

1. THE LIMITS OF THE 100-YEAR FLOODPLAIN ARE SHOWN BASED UPON THE FEMA PETTAGANSETT RIVER PROFILE.
2. MATERIALS THAT ARE HAZARDOUS, SOLUBLE, OR EXPANSIVE SHALL NOT BE STORED WITHIN THE FLOODPLAIN.
3. MATERIALS SHALL NOT BE STORED OVERNIGHT WITHIN THE LIMITS OF THE FLOODPLAIN OR FLOODWAY, UNLESS ADEQUATELY ANCHORED TO PREVENT FLOATATION.

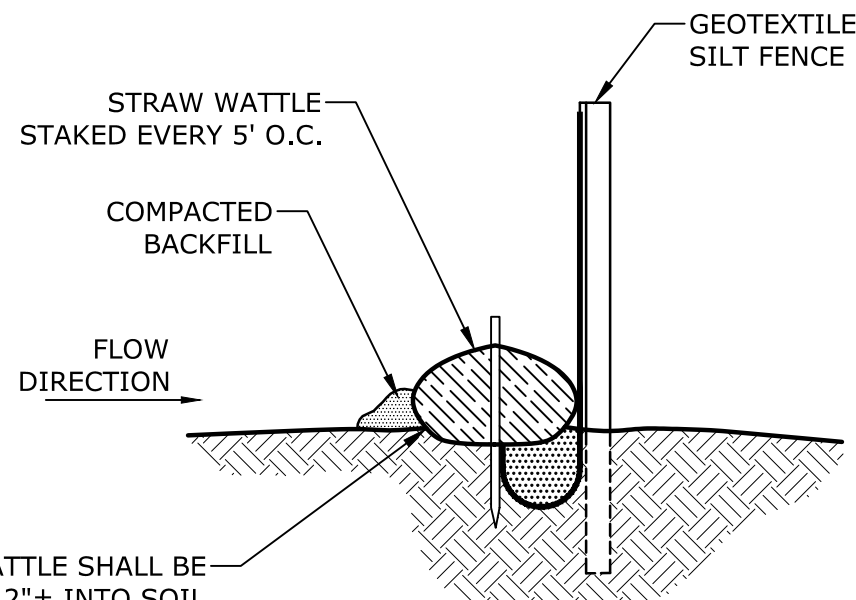


INSTALLATION NOTES:

1. AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY AND STABLE.
2. MAXIMUM SLOPE OF STOCKPILE SHALL BE 2H:1V.
3. UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR HAYBALES, THEN STABILIZED WITH VEGETATION OR COVERED.

TEMPORARY SOIL STOCKPILING

NO SCALE

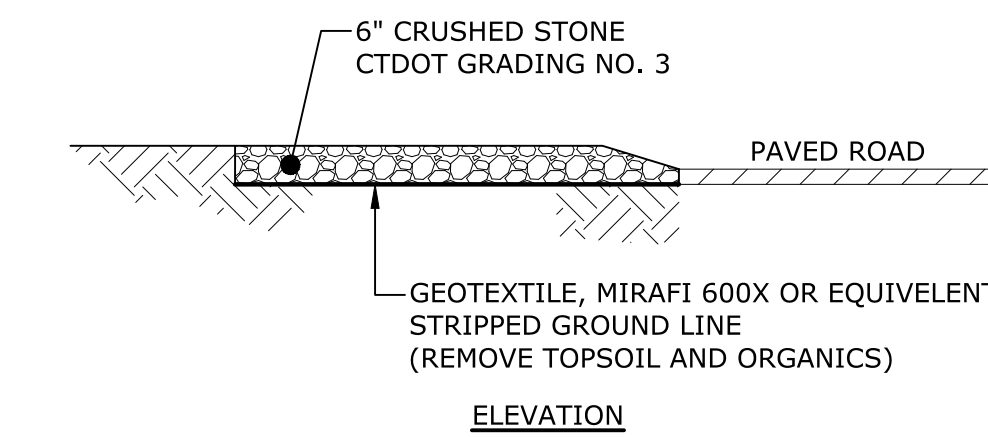
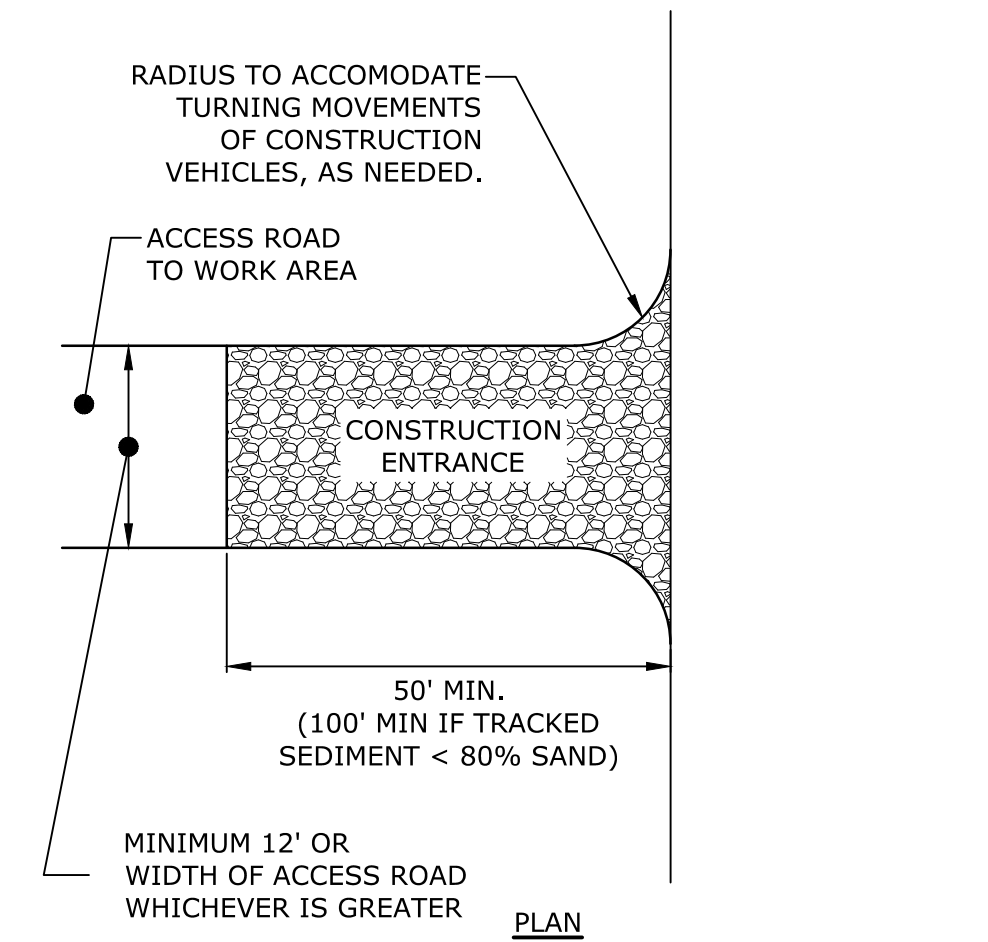


STRAW WATTLE SHALL BE RECESSED 2"± INTO SOIL AND RESTING FIRM ON THE SOIL FOR THE ENTIRE LENGTH. NO DAYLIGHT SHALL BE VISIBLE BENEATH STRAW WATTLE.

BACKFILL AND COMPACT THE EXCAVATED SOIL AS SHOWN ON THE UPHILL SIDE OF THE BARRIER TO PREVENT PIPING.

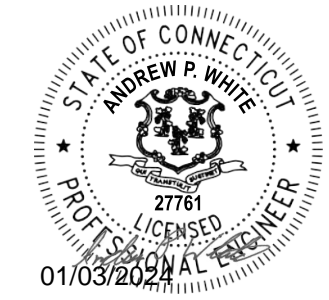
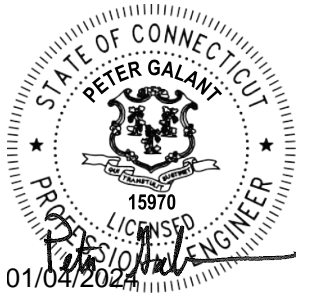
STRAW WATTLE AND SILT FENCE COMBINED BARRIER

NO SCALE



CONSTRUCTION ENTRANCE

NO SCALE



East Lyme Well 5 Lagoon Expansion

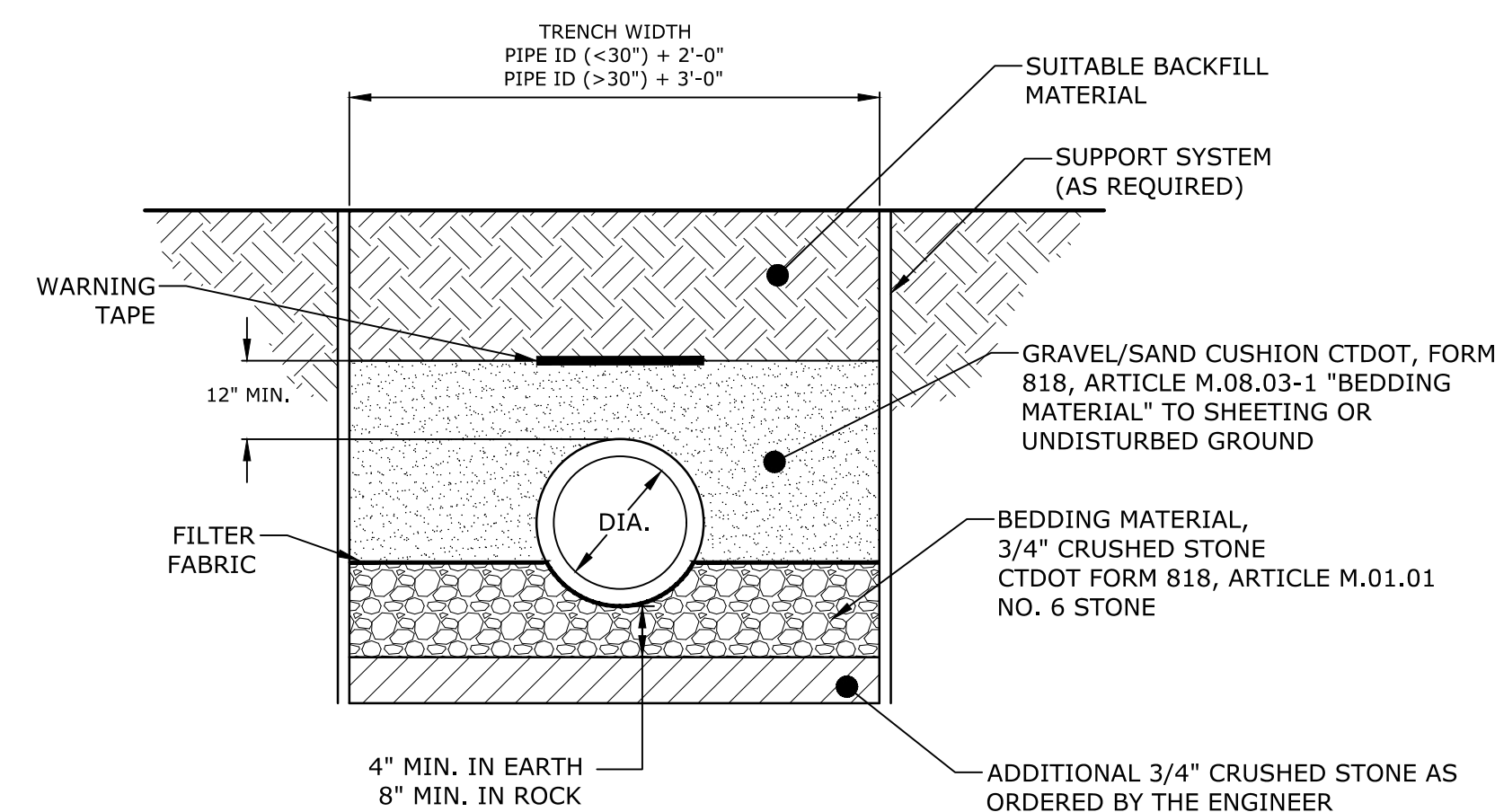
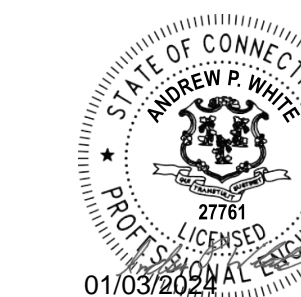
Town of East Lyme Water and Sewer Commission

East Lyme, CT

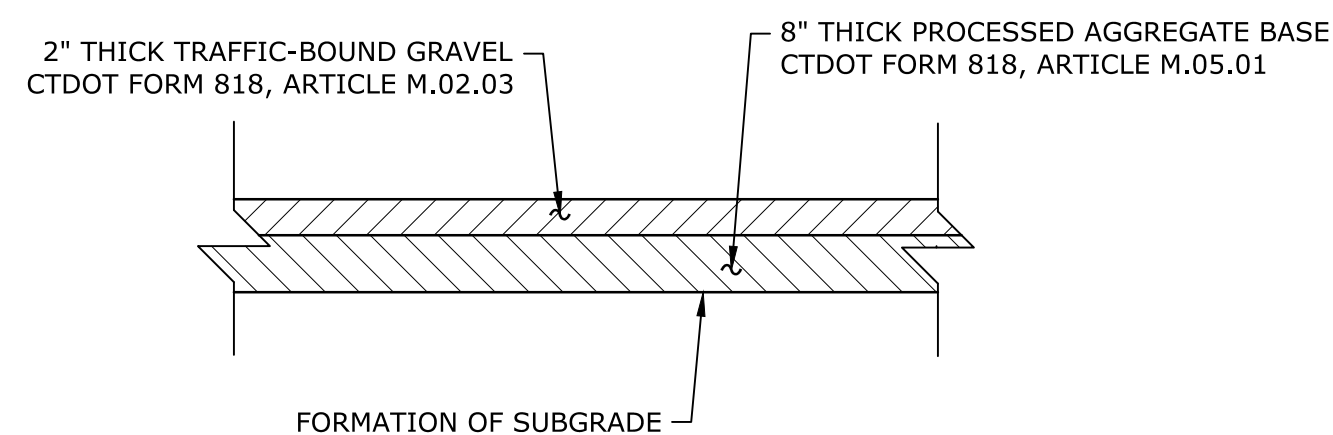
MARK	DATE	DESCRIPTION
PROJECT NO:	E0610-034	
DATE:	JANUARY 2024	
FILE:	E0610-034-C-501-DETL.dwg	
DRAWN BY:	EG	
DESIGNED/CHECKED BY:	APW	
APPROVED BY:	PBG	

SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

SCALE: AS SHOWN

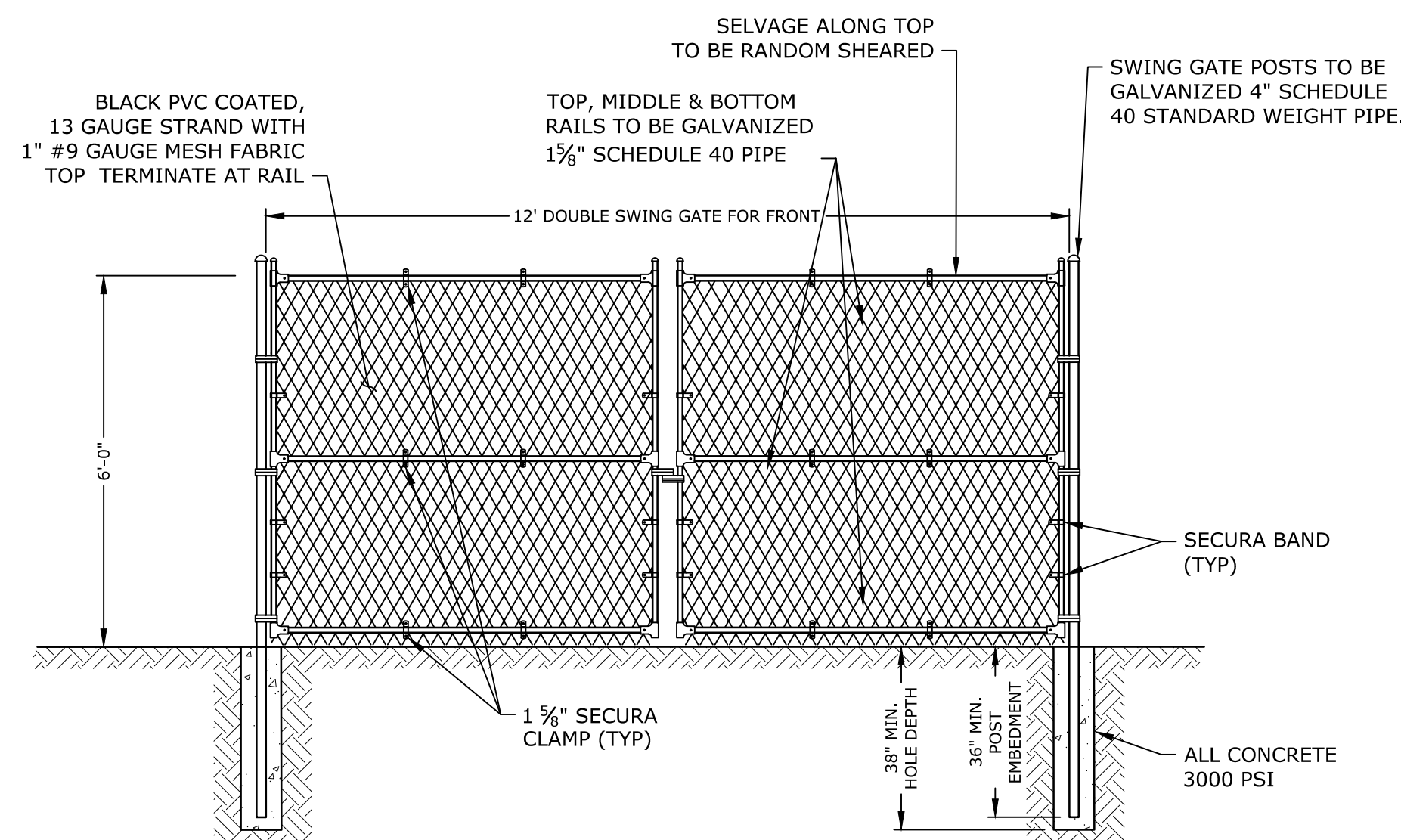


CIRCULAR DIP/RCP TRENCH BEDDING
NO SCALE

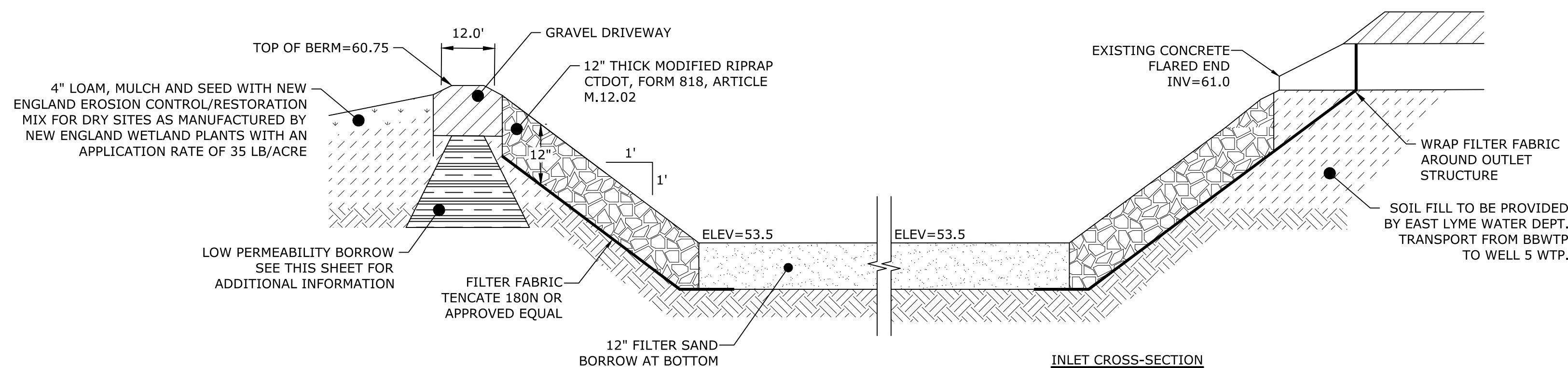


- NOTES**
1. PROCESSED AGGREGATE BASE GRADATION SHALL CONFORM WITH CTDOT, FORM 818, ARTICLE M.05.01-1. COARSE AGGREGATE SHALL CONFORM WITH CTDOT, FORM 818, ARTICLE M.05.01-2(a)(b). THE RECLAIMED MISCELLANEOUS AGGREGATE, ARTICLE M.05.01-2(c) IS NOT ACCEPTABLE.
 2. CRUSHED GRAVEL SUBBASE SHALL CONFORM WITH CTDOT, FORM 818, ARTICLE M.02.02-1. CRUSHER-RUN STONE SHALL CONFORM WITH CTDOT, FORM 818, ARTICLE M.02.02-2. THE RECLAIMED MISCELLANEOUS AGGREGATE, ARTICLE M.02.02-3 IS NOT ACCEPTABLE.

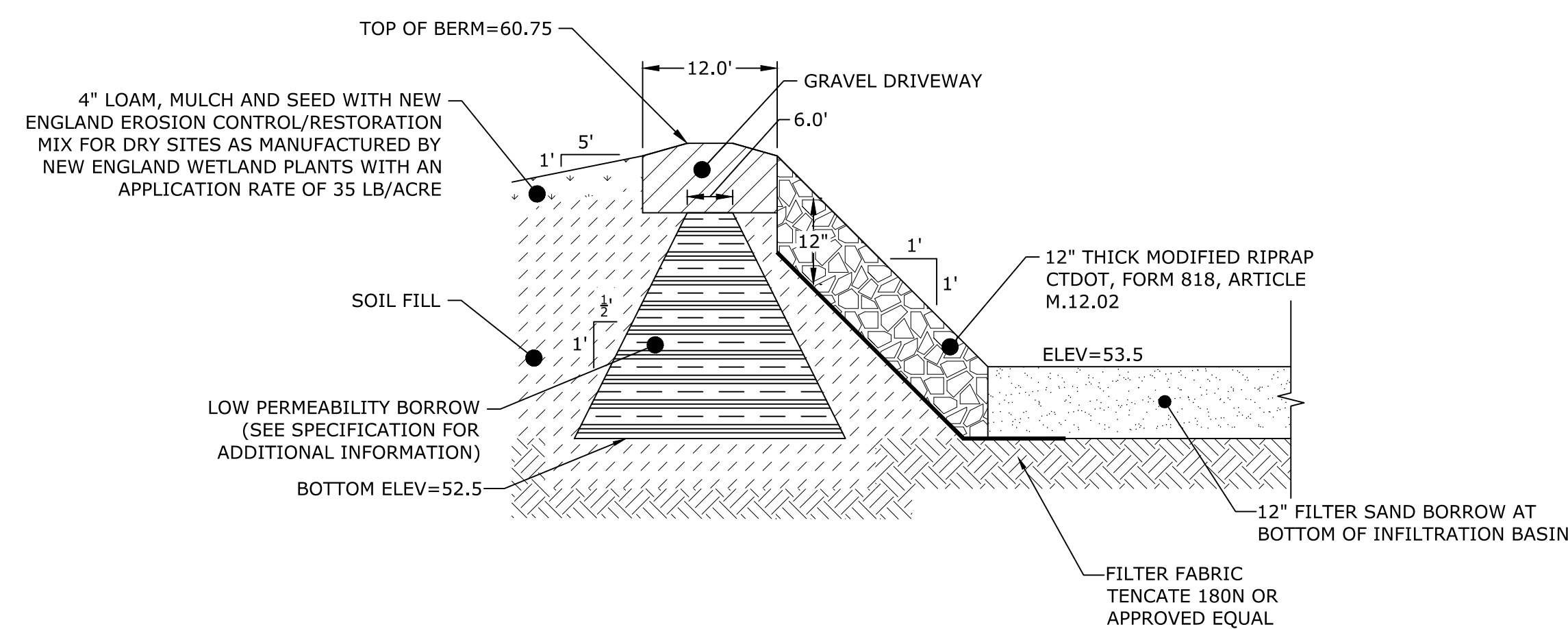
GRAVEL DRIVEWAY
NO SCALE



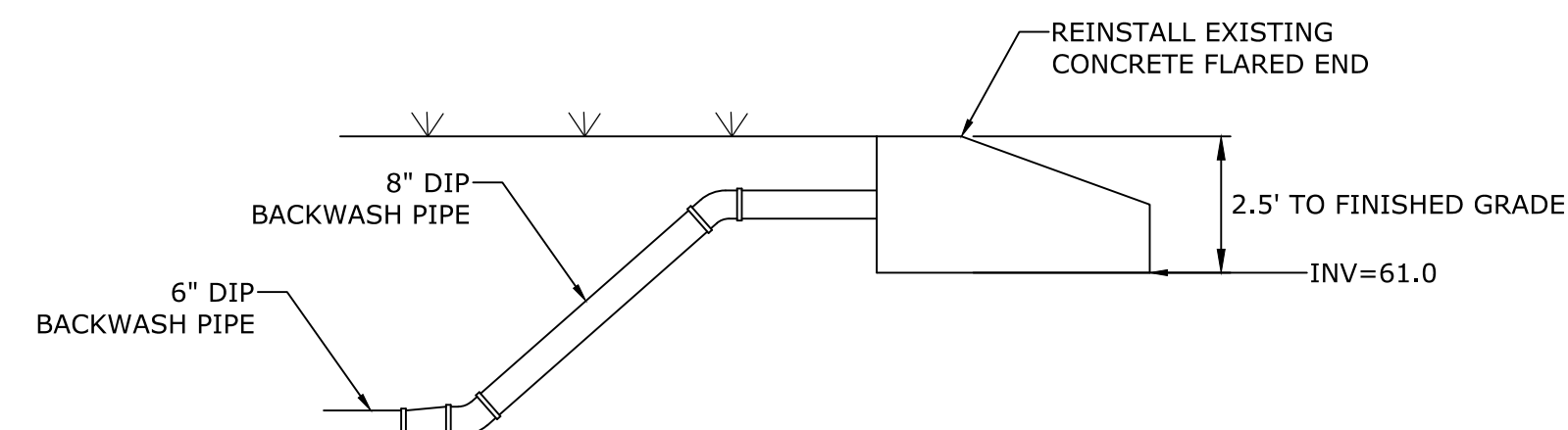
SECURITY FENCE GATE DETAIL
NO SCALE



LAGOON TYPICAL CROSS-SECTION
NO SCALE



TYPICAL DETENTION BASIN FILL BERM CROSS SECTION
NO SCALE



EXISTING LAGOON BACKWASH INLET PIPE
NO SCALE

East Lyme Well 5 Lagoon Expansion

Town of East Lyme Water and Sewer Commission

East Lyme, CT

MARK	DATE	DESCRIPTION
PROJECT NO:	E0610-034	
DATE:	JANUARY 2024	
FILE:	E0610-034-C-501-DETL.dwg	
DRAWN BY:	EG	
DESIGNED/CHECKED BY:	APW	
APPROVED BY:	PBG	

SITE DETAILS - 1

SCALE: AS SHOWN

C-401

SECTION 02075

GEOSYNTHETICS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes
 - 1. Non-woven geotextiles
 - 2. Woven geotextiles
 - 3. Temporary 100% degradable erosion control blankets

1.2 REFERENCES

- A. ASTM D1248 - Specification for Polyethylene Plastics Molding and Extrusion Materials
- B. ASTM D1388 - Test Methods for Stiffness of Fabrics
- C. ASTM D3786 - Test Method for Hydraulic Bursting Strength of Knitted Goods and Non-Woven Fabrics: Diaphragm Bursting Strength Tester Method
- D. ASTM D4218 - Test Method for Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique
- E. ASTM D4491 - Test Methods for Water Permeability of Geotextiles by Permittivity
- F. ASTM D4533 - Test Method for Trapezoid Tearing Strength of Geotextiles
- G. ASTM D4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles
- H. ASTM D4751 - Test Method for Determining the Apparent Opening Size of a Geotextile
- I. ASTM D4833 - Test Method for Index Puncture Resistance of Geotextiles Geomembranes and Related Products
- J. ASTM D5261 - Test Method for Measuring Mass per Unit Area of Geotextiles
- K. ASTM D5262 - Standard Test Method for Evaluating the Unconfined Tension Creep Behavior of Geosynthetics

1.3 SUBMITTALS

- A. Product samples and data for all geosynthetics proposed for use on this project.
- B. Manufacturer-approved construction quality assurance/quality control manual for all of the geosynthetics proposed for use on this project.
- C. Manufacturing quality control testing data specified. Submit certification of required performance testing on all geosynthetics by an independent laboratory and label and identify all geosynthetic products delivered to the site.

- D. Manufacturer's recommended installation and fastening details for the erosion control blankets and turf reinforcement matrices. The following details are required:
 - 1. Typical stapling pattern and spacing. List staple density in terms of staples per square yard.
 - 2. Anchoring details for channels and slopes.
 - 3. Transverse blanket lap splice details, as well as longitudinal lap splice details if parallel blankets are to be installed.
 - 4. Termination details for the origin and termination of the channels and slopes.

1.4 QUALITY ASSURANCE

- A. Obtain from the geosynthetic product manufacturers a warranty that their products are free from defects in materials and workmanship at the time of delivery to the project site.
- B. Material found to be defective or which does not conform to these specifications will be rejected.

1.5 DELIVERY, STORAGE AND PROTECTION

- A. The Engineer reserves the right to reject and require replacement of any damaged materials delivered to the site, at no additional cost to the Owner.
- B. Stockpile and store the materials in accordance with the manufacturer's recommendations.
- C. Label and bag all geosynthetic rolls in packing that is resistant to photo degradation by ultraviolet (UV) radiation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Non-woven Geotextile
 - 1. "180N" as manufactured by TenCate Geosynthetics
 - 2. Or equal
- B. Woven Geotextile
 - 1. "600X" as manufactured by TenCate Geosynthetics
 - 2. Or equal
- C. Temporary 100% Degradable Erosion Control Blankets
 - 1. "SC150 BN" as manufactured by North American Green,
 - 2. "C125 BN" as manufactured by North American Green,
 - 3. "S75" as manufactured by North American Green,
 - 4. Or equal

2.2 MATERIALS

- A. Non-woven geotextiles shall be manufactured from a continuous polypropylene filament. A needle punching process shall achieve bonding.
- B. Woven geotextiles shall be manufactured from a polypropylene slit-film monofilament.
- C. Temporary, 100% degradable ECBs shall be composed of a core of 100% coconut fibers encased between two confining meshes of degradable material.
 - 1. As a minimum, 100% degradable ECBs shall be recommended by the manufacturer for use on 3:1 slopes.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Inspect all products prior to the installation for any defects that may have been the result of storage and handling. The Engineer reserves the right to reject and require replacement of any damaged product, at no additional cost to the Owner.

3.2 INSTALLATION

- A. Install geosynthetic products in accordance with the approved manufacturer's QA/QC manuals, project details, and pertinent sections of these Specifications.

3.3 QUALITY CONTROL

- A. The Engineer may remove a sample (i.e. a strip that is 3 feet long by the entire roll width) from a maximum of 1 roll of each 10 rolls of all geosynthetic materials delivered to the project, and submit the samples to an independent laboratory for analysis of the product to ensure that the geosynthetics meet the specifications herein.

END OF SECTION

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SECTION 02200

SITE PREPARATION

1.1 SUMMARY

- A. Section includes
 - 1. Clearing and grubbing
 - 2. Grading
 - 3. Stripping and stockpiling of soil and sod

1.2 SUBMITTALS

- A. Submit construction methods and equipment that will be utilized for the clearing, grubbing, and waste material disposal specified within this Section.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CLEARING AND GRUBBING

- A. Except as otherwise directed, cut, grub, remove and dispose of all trees, stumps, brush, shrubs, roots and any other objectionable material within the limits of the Work on the site and where required to construct the work.
- B. Protect trees or groups of trees, designated by the Engineer to remain, from damage by all construction operations by erecting suitable barriers, or by other approved means. Conduct clearing operations to prevent falling trees from damaging trees designated to remain.
 - 1. All damage done to the trees by the Contractor's operation shall be trimmed and painted where cut as directed or as necessary to provide adequate vertical clearance for construction activities. The dressing or paint shall be applied no later than two days after the cuts are made.
 - 2. Use all necessary precautions to prevent injury to other desirable growth in all areas. Contractor shall assume full responsibility for any damage.
- C. Protect areas outside the limits of clearing from damage. No equipment or materials shall be stored in these areas.
- D. No stumps, trees, limbs, or brush shall be buried in fills or embankments.

3.2 DISPOSAL OF MATERIALS

- A. Remove all tree trunks, limbs, roots, stumps, brush, foliage, other vegetation and objectionable material from the site and dispose of in a legal manner.
- B. Burning or direct burial of cleared and grubbed materials on-site will not be permitted.

3.3 GRADING

- A. In preparation for placing loam, paved drives and appurtenances, perform grading to the lines, grades and elevations shown on the Drawings, and otherwise directed by the Engineer and perform in such a manner that the requirements for formation of embankments can be followed. All material encountered, regardless of its nature, within the limits indicated, shall be removed and disposed of as directed. During the process of grading, maintain the subgrade in such condition that it will be well drained at all times. Install temporary drains and drainage ditches to intercept or divert surface water that may affect the work when necessary.
- B. If at the time of grading it is not possible to place material in its final location, stockpile material in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.
- C. The right is reserved to make minor adjustments or revisions in lines or grades if found necessary as the work progresses.
- D. Stones or rock fragments larger than 4 inches in their greatest dimensions will not be permitted in the top 12 inches of the finished subgrade of all fills or embankments except along the access roadways and rip-rap where shown on the Drawings.
- E. In cuts, loose or protruding rocks on the excavated slopes shall be barred loose or otherwise removed to line or finished grade of slope. Cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings or as directed by the Engineer.

3.4 DUTCH ELM WOOD

- A. Dutch Elm diseased wood shall be disposed of in accordance with any local regulations.
- B. Where the work includes the removal of elm trees or the limbs of elm trees, such trees or limbs thereof shall be disposed of immediately after cutting or removal and in such a manner as to prevent the spread of Dutch Elm disease. This shall be accomplished by covering them with earth to a depth of at least 6 inches in areas outside the right-of-way locations where the Contractor has arranged for disposal.
- C. Where the work includes the removal and disposal of stumps of elm trees, such stumps shall be completely disposed of immediately after cutting in the manner specified above.

END OF SECTION

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SECTION 02210

SUBSURFACE INVESTIGATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. The Contractor acknowledges satisfaction as to the nature and location of the work, the general and local conditions, particularly those bearing upon transportation, disposal, handling, and storage of materials, availability of labor, water, electric power, roads and uncertainties of weather, groundwater table or similar physical conditions at the site, the conformation of subsurface materials to be encountered, the character of equipment and facilities needed prior to and during the prosecution of the work and all other matters which can in any way affect the work or the cost thereof under this Contract. Any failure by the Contractor to acquaint himself with all available information concerning these conditions will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the work.
- B. Related Sections
 - 1. Section 02920 - Lawns and Grasses
 - 2. Section 02315 - Excavation, Backfill, Compaction, and Dewatering

1.2 REFERENCES

- A. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.560 through 1926.562 including Appendices A through F

1.3 SITE CONDITIONS

- A. Soils Investigation
 - 1. Available geotechnical data (test pit logs and lab testing results) and exploration locations are included on Existing Conditions Plan, sheet C-002 of the Drawing Set. Such data is offered in good faith solely for the purposes of placing the Contractor in receipt of all information available. The Contractor must interpret such data according to their own judgment and acknowledges that they are not to rely solely on the recorded information to accurately describe the subsurface conditions which may be found to exist. The Contractor further acknowledges that they assume all risk contingent upon the nature of the subsurface conditions actually encountered while performing the Contracted Work, even though such conditions may result in the Contractor performing more or less work than originally anticipated.

END OF SECTION

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SECTION 02315

EXCAVATION, BACKFILL, COMPACTION AND DEWATERING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Excavation, backfill and compaction for buildings, retaining walls and other structures
 - 2. Excavation, backfill and compaction for subsurface utilities
 - 3. Removal, handling and disposal of rock
 - 4. Earth retention systems
 - 5. Temporary dewatering systems
- B. Related Sections
 - 1. Section 02370 - Sedimentation and Erosion Control
 - 2. Section 02210 - Subsurface Investigations
 - 3. Section 02320 - Borrow Materials
 - 4. Section 02410 - Rock Excavation

1.2 REFERENCES

- A. ASTM D1557-07 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))
- B. ASTM D1556-07 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- C. ASTM D2487-06e1 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- D. ASTM D6938-08a - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- E. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.650 through 1926.652 including Appendices A through F

1.3 DEFINITIONS

- A. Benching - A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.
- B. Earth Retention Systems - Any structural system, such as sheeting and bracing or cofferdams, designed to retain in-situ soils in place and prevent the collapse of the sides of an excavation in order to protect employees and adjacent structures.

- C. Excavation - Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.
- D. Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include earth retention systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.
- E. Registered Professional Engineer - A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.
- F. Shield System - A structure that is designed to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 29 CFR 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."
- G. Sloping - A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.
- H. Temporary Dewatering System - A system to lower and control water to maintain stable, undisturbed subgrades at the lowest excavation levels. Dewatering shall be provided for all pipelines, structures and for all other miscellaneous excavations.
- I. Trench - A narrow excavation (in relation to its length) made below the surface of the ground, of at least three feet in depth. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).

1.4 SUBMITTALS

- A. Drawings and calculations for each Earth Retention System required in the Work. The submittal shall be in sufficient detail to disclose the method of operation for each of the various stages of construction required for the completion of the Earth Retention Systems.
 - 1. Submit calculations and drawings for Earth Retention Systems prepared, signed and stamped by a Professional Engineer registered in the state where the work is performed.
- B. Performance data for the compaction equipment to be utilized
- C. Construction methods that will be utilized for the removal of rock

- D. Modified Proctor Test (ASTM D1557) results and soil classification (ASTM D2487) for all proposed backfill materials at the frequency specified below:
1. For suitable soil materials removed during Excavation, perform one test for every 1,000 cubic yards of similar soil type. Similarity of soil types will be as determined by the Engineer.
 2. For borrow materials; perform tests at frequency specified in Section 02320, Borrow Materials.
- E. Compaction test results (i.e. ASTM D6938 or ASTM D1556) at a frequency of one test for every 100 cubic yards of material backfilled or at a minimum of one test per lift. The Engineer will determine the locations and lifts to be tested. The Contractor shall plan his operations to allow adequate time for laboratory tests and to permit taking of field density tests during compaction.
1. Methods and equipment proposed for compaction shall be subject to prior review by the Engineer. Compaction generally shall be done with vibrating equipment. Static rolling without vibration may be required by the Engineer on sensitive soils that become unstable under vibration. Displacement of, or damage to existing utilities or structure shall be avoided. Any utility or structure damaged thereby shall be replaced or repaired as directed by the Engineer.
 2. Additional compaction testing may be required when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.
 - a. Any costs associated with correcting and retesting as a result of a failure to meet compaction requirements shall be borne by the Contractor.
 3. If all compaction test results within the initial 25% of the total anticipated number of tests indicate compacted field densities equal to or greater than the project requirements, the Engineer may reduce frequency of compaction testing. In no case will the frequency be reduced to less than one test for every 500 cubic yards of material backfilled.
 4. The Contractor is cautioned that compaction testing by nuclear methods may not be effective where trenches are so narrow that trench walls impact the attenuation of the gamma radiation, when adjacent to concrete that impacts the accuracy of determining moisture content, or where oversize particles (i.e. large cobbles or coarse gravels) are present. In these cases, other field density testing methods may be required.
- F. Dewatering plan for the excavation locations. Design shall include calculations and drawings stamped and signed by a Professional Engineer registered in the state where the work is performed.

1.5 QUALITY ASSURANCE

- A. All Excavation, Trenching, and related Earth Retention Systems shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart

- P), and other State and local requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- B. The following test procedures will be performed by the Owner's inspection agency. Results will be submitted to the Engineer for review.
1. Modified Proctor Test (ASTM D1557) results and soil classification (ASTM D2487) for all proposed backfill materials at the frequency specified below:
 - a. For suitable soil materials removed during excavation, perform one test for every 1,000 cubic yards of similar soil type. Similarity of soil types will be as determined by the Engineer.
 - b. For borrow materials; perform tests at frequency specified in Section 02320 - Borrow Materials.
 2. Compaction test results (i.e. ASTM D6938 or ASTM D1556) at a frequency of one test for every 100 cubic yards of material backfilled. The Engineer will determine the locations and lifts to be tested.
 - a. The Engineer may specify additional compaction testing when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.
 - b. If all compaction test results within the initial 25% of the total anticipated number of tests indicate compacted field densities equal to or greater than 95% of maximum dry density at optimum moisture content, the Engineer may reduce frequency of compaction testing. In no case will the frequency be reduced to less than one test for every 500 cubic yards of material backfilled.
 - c. The Contractor is cautioned that compaction testing by nuclear methods may not be effective where excavation sidewalls impact the attenuation of the gamma radiation or where oversize particles (i.e. large cobbles or coarse gravels) are present. In these cases, other field density testing methods may be required.
- C. Employ the services of a dewatering specialist or firm when well points, deep wells, recharge systems, or equal systems are required. Specialist shall have completed at least 5 successful dewatering projects of equal size and complexity and with equal systems.

1.6 PROJECT CONDITIONS

- A. Notify Call Before You Dig at least two full working days prior to beginning excavation, and obtain a "Call Before You Dig identification number.
- B. Notify utility owners in reasonable advance of the work and request the utility owner to stake out on the ground surface the underground facilities and structures. Notify the Engineer in writing of any refusal or failure to stake out such underground utilities after reasonable notice.

- C. Make explorations and Excavations to determine the location of existing underground structures, pipes, house connection services, and other underground facilities in accordance with Paragraph 3.2.D of this Section.
- D. In accordance with State and local requirements, no person shall, except in an emergency, make an excavation in any public way, public property, or privately owned land until a permit is obtained from the appropriate designated permitting authority.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

- A. Fill material is subject to the approval of the Engineer and may be either material removed from excavations or borrow from off site. Fill material, whether from the excavations or from borrow, shall be of such nature that after it has been placed and properly compacted, it will make a dense, stable fill.
- B. Satisfactory fill materials shall include materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, SW, and SP. Additional requirements are included in Section 02320.
- C. Satisfactory fill materials shall not contain trash, refuse, vegetation, masses of roots, individual roots more than 18 inches long or more than 1/2 inch in diameter, or stones over 6 inches in diameter. Unless otherwise stated in the Contract Documents, organic matter shall not exceed minor quantities and shall be well distributed.
- D. Satisfactory fill materials shall not contain frozen materials nor shall backfill be placed on frozen material.
- E. Excavated surface and/or pavement materials such as gravel or trap rock that are salvaged may be used as a sub-grade material, if processed to the required gradation and compacted to the required degree of compaction. In no case shall salvaged materials be substituted for the required gravel base.

2.2 DEWATERING MATERIALS

- A. Provide haybales and silt fence in accordance with Section 02370.
- B. Provide silt filter bags (Dandy Dewatering Bag, Dirtbag, JMP Environ-Protection Filter Bag, or equal) of adequate size to match flow rate.
- C. Provide dewatering equipment and materials for engineered dewatering systems.

PART 3 EXECUTION

3.1 PREPARATION

- A. Public Safety and Convenience
 1. Adhere to state and local requirements for all excavation work.
 2. Take precautions for preventing injuries to persons or damage to property in or about the Work.
 3. Provide safe access for the Owner and Engineer at site during construction.

4. Do not obstruct site drainage, natural watercourses or other provisions made for drainage.

3.2 CONSTRUCTION

A. Earth Retention Systems

1. Provide Earth Retention Systems necessary for safety of personnel and protection of the Work, adjacent work, utilities and structures.
2. Maintain Earth Retention Systems for the duration of the Work.
3. Sheeting
 - a. Systems shall be constructed using interlocking corner pieces at the four corners. Running sheet piles by at the corners, in lieu of fabricated corner pieces, will not be allowed.
 - b. Drive sheeting ahead of and below the advancing excavation to avoid loss of materials from below and from in front of the sheeting.
 - c. Sheeting is to be driven to at least the depth specified by the designer of the earth retention system, but no less than 2 feet below the bottom of the Excavation.
4. Remove earth retention system, unless designated to be left in place, in a manner that will not endanger the construction or other structures. Backfill and properly compact all voids left or caused by the withdrawal of sheeting.
 - a. Remove earth retention systems, which have been designated by the Engineer to be left in place, to a depth of 3 feet below the established grade.

B. Excavation

1. Perform excavation to the lines and grades indicated on the Drawings. Backfill unauthorized over-excavation in accordance with the provisions of this Section.
2. Excavate with equipment selected to minimize damage to existing utilities or other facilities. Hand excavate as necessary to locate utilities or avoid damage.
3. Sawcut the existing pavement in the vicinity of the excavation prior to the start of excavation in paved areas, so as to prevent damage to the paving outside the requirements of construction.
4. Perform excavation in such a manner as to prevent disturbance of the final subgrade. The Engineer or Owner may require the final six inches of excavation be performed by hand, with the use of a smooth-faced bucket, or other means acceptable to the Engineer or Owner, at no additional cost if subgrade disturbance is considered excessive as judged by the Engineer or Owner.
5. During excavation, material satisfactory for backfill shall be stockpiled in an orderly manner at a distance from the sides of the excavation equal to at least one half the depth of the excavation, but in no case closer than 2 feet.

- a. Excavated material not required or not suitable for backfill shall be removed from the site.
 - b. Perform grading to prevent surface water from flowing into the excavation.
 - c. Pile excavated material in a manner that will endanger neither the safety of personnel in the excavation nor the Work itself. Avoid obstructing sidewalks and driveways.
 - d. Hydrants under pressure, valve pit covers, valve boxes, manholes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the Work is completed.
6. Grade or create berms or swales to direct surface water from excavations to appropriate structures designed to accommodate storm water. If no structures exist, direct water to areas that minimize impacts to adjacent structures and properties.
 7. Make pipe trenches as narrow as practicable and keep the sides of the trenches undisturbed until backfilling has been completed. Provide a clear distance of 12 inches on each side of the pipe.
 8. Perform the excavation in such a manner as to prevent disturbance of the final subgrade. If excessive subgrade disturbance is occurring, as judged by the Owner or Engineer, then the final 6 inches of the excavation shall be performed by hand, with the use of a smooth-faced bucket, or other means acceptable to the Engineer or Owner.
 - a. Grade the excavation bottom to provide uniform bearing and support for the bottom quadrant of each section of pipe.
 - b. Excavate bell holes at each joint to prevent point bearing.
 - c. Remove stones greater than 6 inches in any dimension from the bottom of the trench to prevent point bearing.
 9. If satisfactory materials are not encountered at the design subgrade level, excavate unsatisfactory materials to the depth directed by the Engineer and properly dispose of the material. Backfill the resulting extra depth of excavation with satisfactory fill materials and compact in accordance with the provisions of this Section.
- C. Backfill and Compaction
1. Unless otherwise specified or indicated on the Drawings, use satisfactory material removed during excavation for backfilling trenches. The Engineer may require stockpiling, drying, blending and reuse of materials from sources on the Project.
 2. Spread and compact the material promptly after it has been deposited. When, in the Engineer's judgment, equipment is inadequate to spread and compact the material properly, reduce the rate of placing of the fill or employ additional equipment.

3. Prior to backfilling or placement of structures, excavated subgrades shall be proof compacted with either 10 passes of a 10-ton vibratory drum roller for open excavations or 6 passes of a large, reversible, walk behind vibratory compactor capable of exerting a minimum force of 2,000 pounds in trench or pit excavations. Soft or weak spots shall be over-excavated and replaced with compacted Granular Fill or compacted Crushed Stone wrapped in a non-woven geotextile, as directed by the Owner or their representative. If proof compaction will prove detrimental to the subgrade due to the presence of groundwater, static rolling may be allowed at the discretion of the Engineer or Owner.
4. Soil bearing surfaces shall be protected against freezing and the elements before and after concrete placement. If construction is performed during freezing weather, structures shall be backfilled as soon as possible after they are constructed. Insulating blankets or other means shall be used for protection against freezing at the discretion of the Engineer or Owner.
5. When excavated material is specified for backfill and there is an insufficient amount of this material at a particular location on the Project due to rejection of a portion thereof, consideration will be given to the use of excess material from one portion of the Project to make up the deficiency existing on other portions of the Project.
 - a. Use borrow material if there is no excess of excavated material available at other portions of the Project.
6. Backfilling and compaction methods shall attain 95% of maximum dry density at optimum moisture content as determined in accordance with ASTM D1557.
7. Do not place stone or rock fragment larger than six inches in greatest dimension in the backfill.
8. Maximum loose lift height for backfilling existing or borrow material shall be 12 inches, unless satisfactory compaction is demonstrated otherwise to the Engineer through field-testing. In no case shall loose lift height for backfilling exceed 3 feet.
9. Do not drop large masses of backfill material into the trench endangering the pipe or adjacent utilities.
10. Install pipe in rock excavated trenches on a dense graded stone bedding with a minimum depth of 6 inches. Shape the stone bedding at the pipe bells to provide uniform support. Encase the pipe in the dense graded crushed stone bedding to a grade 6 inches over the top of the pipe and 12 inches on each side of the pipe.
11. Backfill from the bottom of the trench to the centerline of the pipe with the specified material. This initial backfill is to be placed in layers of no more than 6 inches and thoroughly tamped under and around the pipe. This initial backfilling shall be deposited in the trench for its full width on both sides of the pipe, fittings and appurtenances simultaneously.

12. Electrical conduit not encased in concrete, shall be backfilled with sand borrow conforming to the requirements of Section 02320. The backfill shall be placed in the trench for its full width and shall extend to 12 inches over the conduit.
13. Where excavation is made through permanent pavements, curbs, paved driveways, or paved sidewalks, or where such structures are undercut by the excavation, place the entire backfill to sub-grade with granular materials and compact in 6 inch layers. Use approved mechanical tampers for the full depth of the trench. If required, sprinkle the backfill material with water before tamping so as to improve compaction. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required to correct the problem, and shall then be refilled and properly compacted with the surface restored to required grade at no additional expense.
14. The Contractor shall not place backfill against or on structures until they have attained sufficient strengths to support the loads to which they will be subjected, without distortion, cracking, or other damage. As soon as possible after the structures are adequate, they shall be backfilled with suitable backfill material.
15. Place and compact backfill around manholes, vaults, pumping stations, gate boxes or other structures in six inch layers, from a point one foot over the pipe. Exercise care to protect and prevent damage to the structures.

D. Test Pit Excavation

1. General requirements of test pits are specified in Section 02210.

E. Dewatering

1. Obtain the following construction dewatering permits, as required:
 - a. CT DEEP permit titled “Stormwater and Dewatering Wastewaters from Construction Activities (DEP-PERD-GP-015)”
2. Provide, operate and maintain adequate pumping, diversion and drainage facilities in accordance with the approved dewatering plan to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. Locate dewatering system components so that they do not interfere with construction under this or other contracts.
3. Conduct operations so as to prevent at all times the accumulation of water, ice and snow in excavations or in the vicinity of excavated areas so as to prevent water from interfering with the progress or quality of the work.
4. Take actions necessary to ensure that dewatering discharges comply with permits applicable to the Project. Dispose of water from the trenches and excavations in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.
5. Repair any damage resulting from the failure of the dewatering operations and any damage resulting from the failure to maintain all the areas of work in a suitable dry condition.

6. Exercise care to ensure that water does not collect in the bell or collar holes to sufficient depth to wet the bell or collar of pipes waiting to be jointed.
7. Take precautions to protect new work from flooding during storms or from other causes. Control the grading in the areas surrounding all excavations so that the surface of the ground will be properly sloped to prevent water from running into the excavated area. Where required, provide temporary ditches for drainage. Upon completion of the work, all areas shall be restored to original condition.
8. Brace or otherwise protect pipelines and structures not stable against uplift during construction.
9. Do not excavate until the dewatering system is operational and the excavation may proceed without disturbance to the final subgrade.
10. Unless otherwise specified, continue dewatering uninterrupted until the structures, pipes, and appurtenances to be installed have been completed such that they will not float or be otherwise damaged by an increase in groundwater elevation.
11. Temporarily lower the groundwater level at least two feet below excavations to limit potential “boils”, loss of fines, or softening of the ground. If any of these conditions are observed, submit a modified dewatering plan to the Engineer within 48 hours. Implement the approved modified plan and repair any damage incurred.
12. When subgrades are soft, weak, or unstable due to improper dewatering techniques, remove and replace the materials in accordance with Section 02320 at no cost to the Owner.
13. Notify the Engineer immediately if any settlement or movement is detected of survey points adjacent to excavations being dewatered. If settlement is deemed by the Engineer to be related to the dewatering, submit a modified dewatering plan to the Engineer within 24 hours. Implement the approved modified plan and repair any damage incurred to the adjacent structure at no cost to the Owner.
14. Dewatering discharge:
 - a. Install sand and gravel, or crushed stone, filters in conjunction with sumps, well points, and/or deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
 - b. Transport pumped or drained water without interference to other work, damage to pavement, other surfaces, or property. Pump water through a silt filter bag or other approved sedimentation device prior to discharge to grade of drainage system.
 - c. Do not discharge water into any sanitary sewer system.
 - d. Provide separately controllable pumping lines.
 - e. The Engineer reserves the right to sample discharge water at any time.

15. Install erosion/sedimentation controls for velocity dissipation at point discharges onto non-paved surfaces.
16. Removal
 - a. Do not remove dewatering system without written approval from the Engineer.
 - b. Backfill and compact sumps or ditches with screened gravel or crushed stone in accordance with Section 02320.
 - c. Remove well points and deep wells. Backfill abandoned well holes with cement grout having a water cement ratio of 1 to 1 by volume.

3.3 PROTECTION

A. Protection of Existing Structures

1. All existing foundations, conduits, wall, pipes, wires, poles, fences, property line markers and other items which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the Contractor. Should such items be damaged, they shall be restored by the Contractor to at least as good condition as that in which they were found immediately before the Work began.

B. Accommodation of Traffic

1. Streets and drives shall not be unnecessarily obstructed. The Contractor shall take such measures at his own expense to keep the street or road open and safe for two-way traffic unless otherwise indicated.
2. Construct and maintain such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians and vehicles. Provide substantial barricades at crossings of trenches, or along the trench to protect the traveling public.
3. Where deemed necessary, such additional passageways as may be directed shall be maintained free of such obstructions. All material piles, open excavations, equipment, and pipe which may serve as obstructions to traffic shall be protected by proper lights, signage, or guards as necessary.
4. All traffic controls shall be in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition.

C. Erosion and Sedimentation Control

1. Take all necessary steps to prevent soil erosion.
2. Plan the sequence of construction so that only the smallest practical area of land is exposed at any one time during construction.
3. Temporary vegetation and/or mulching shall be used to protect critical areas exposed during construction as judged by the Engineer.

END OF SECTION

SECTION 02320

BORROW MATERIALS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes

1. Processed Aggregate Base
2. Filter Sand Borrow
3. Low Permeability Borrow
4. Granular Fill
5. Gravel/Sand Cushion for Pipe Bedding
6. Crushed Stone for Pipe Bedding
7. Traffic Bound Gravel for Gravel Access Drive
8. Ordinary Borrow
9. Riprap for Lagoon Sidewalls

B. Related Sections

1. Section 02315 – Excavation, Backfill, Compaction and Dewatering

1.2 REFERENCES

- A. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- B. ASTM C117 - Standard Test Method for Materials Finer than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing
- C. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- D. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb./ft³)
- E. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head)
- F. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- G. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- H. ASTM D422 - Standard Test Method for Particle-Size Analysis of Soils (including Hydrometer analysis for silts and clays)

- I. ASTM D4318 – Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils
- J. ASTM D5084 – Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials using a Flexible Wall Permeameter (Falling Head Permeability Test)
- K. AASHTO – Standard Specification for Transportation Materials and Methods of Sampling and Testing, 1986 Edition as amended
- L. Connecticut Department of Transportation (CTDOT), Standard Specifications for Roads, Bridges, and Incidental Construction, ‘Form 818’, latest revision.

1.3 SUBMITTALS

- A. Representative Samples of borrow materials taken from the source. Tag, label, and package the Samples as requested by Engineer. Provide access to the borrow site for field evaluation and inspection.
- B. Provide sieve analysis (ASTM C136) for all granular materials and permeability analysis (ASTM D2434), particle size analysis (ASTM D422) and Atterberg Limits (D4318) for low permeability borrow from certified soils testing laboratory for all borrow materials. Take and test a sample, at no additional cost to the Owner for each 100 c.y. of borrow material placed.
- C. Provide modified proctor analysis (ASTM D1557) from certified soils testing laboratory for all borrow materials.
- D. Provide sieve analysis (ASTM 422) from certified soils testing laboratory for all borrow materials (including hydrometer analysis for silts and clays).
- E. Provide permeability analysis from certified soils testing laboratory for low permeability soil borrow and sand borrow materials.
 - 1. Take and test a sample of low permeability soils using ASTM Method D5084 for each 100 cy of material placed, or as directed by the Engineer.
- F. Provide Atterberg Limits testing (ASTM D4318) for low permeability soil borrow.
 - 1. A sample of low permeability soil shall be taken and tested for each 300 cy of material placed, or as directed by the Engineer.
- G. The Engineer reserves the right to require more frequent testing than that which is specified above should the borrow characteristics change.

1.4 QUALITY ASSURANCE

- A. No borrow shall be placed prior to the approval of Samples by the Engineer.
- B. A Certificate of Clean Fill must be provided to Engineer and Owner for approval prior to delivery of any and all fill material including but not limited to, mineral soil, borrow material, structural fill, processed fill material, loam, or topsoil to be placed on site during the course of the Work. The Certificate must include laboratory analytical reports for all material to be used at the site on a basis of one sample per every 500 cubic yards or lesser portions thereof. Analytical reports must demonstrate that the proposed material does not contain detectable concentrations of contaminants

including but not limited to; petroleum hydrocarbons, semi volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), pesticides, and/or herbicides and metals listed in the Connecticut Remediation Standard Regulations do not exceed minimal concentrations deemed allowable by Engineer and Owner. No fill material shall be placed on site until Contractor has received approval from Engineer and/or Owner. Engineer and Owner reserve the right to collect and analyze samples from any proposed fill material prior to or after delivery to the site and to allow use of off-specification material at their sole discretion.

The Certificate must clearly state the following and be signed by an authorized signatory employed by the Contractor:

1. Volume of material to be used
2. Process by which the material was obtained
3. Location of origin and summary of current and past site uses of the location of origin
4. Statement from Contractor that the analytical reports included with the Certificate represent the specific material to be used at the site
5. Statement that the Contractor does not know or have reason to believe that the proposed fill material contains foreign materials or contaminants.

1.5 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. Comply with any environmental requirements and restrictions.
2. Keep all public and private roadway surfaces clean during hauling operations and promptly and thoroughly remove any borrow or other debris that may be brought upon the surface before it becomes compacted by traffic. Frequently clean and keep clean the wheels of all vehicles used for hauling to avoid bringing any dirt upon the paved surfaces.

PART 2 PRODUCTS

2.1 PROCESSED AGGREGATE BASE

- A. Processed Aggregate Base for Bituminous Concrete Pavement shall conform to the requirements of CTDOT Form 818, article M.05.01-1. Coarse aggregate shall conform to the requirements of Article M.05.01-2(1) or M.05.01-2(b). The reclaimed miscellaneous aggregate, Article M.05.01-2(c) is not acceptable.
- B. Stockpile the processed materials in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.
- C. Comply with applicable Town and State material requirements.

2.2 FILTER SAND BORROW

- A. Filter Sand shall be free from ice and snow, roots, silt, clay, loam, shale, and other deleterious or organic matter. Filter Sand shall conform to the quality requirements of ASTM C33, and shall conform to the following gradation requirements:

Percent by Weight Passing Through

Sieve Size	Minimum	Maximum
1/2"	100	-
3/8"	85	100
#4	60	100
#16	35	80
#50	10	55
#100	2	10
#200	0	2

- B. Sand borrow materials with up to 10% by weight, passing the #200 sieve shall be acceptable for use in a final cover system provided that all other gradation and permeability requirements are satisfied.

2.3 LOW PERMEABILITY BORROW

- A. Low permeability soil shall be free from litter and foreign materials.
- B. The permeability shall be no greater than 1×10^{-7} cm/s. at 95% compaction.
- C. Low permeability material shall be consistent with one of the following USCS designations:
 - OC – Clayey gravels, gravel-sand-clay mixtures
 - SC – Clayey sands, sand-clay mixtures.
 - CH – Inorganic clays of high plasticity index, fat clays
 - CL – Inorganic clays of low to medium plasticity index, gravelly clays, sandy clays, silty clays, lean clays.
 - OH – Organic clays of medium to high plasticity.

2.4 GRANULAR FILL

- A. Granular Fill to be used as fill material to achieve gravel base grade beneath structures, pavement, or other area requiring structural fill shall consist of inert material that is hard, durable stone and sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

- B. Gradation requirements for Granular Fill shall conform to the requirements in CTDOT, Form 818, Article M.02.01.

2.5 GRAVEL/SAND CUSHION FOR PIPE BEDDING

- A. Sand borrow material shall be supplied from an off-site borrow area approve by the Engineer. Testing of the off-site sand borrow shall be at the Contractor's expense.
- B. Sand borrow shall consist of clean, inert, hard, durable grains of quartz or other hard, durable, rock, free from loam or clay, surface coatings and deleterious materials. The allowable amount of material passing a No. 200 sieve as determined by ASTM-C117 shall not exceed 10% by weight.
- C. Material shall consist of a clean, non-plastic, granular material conforming to the requirements of a SW, SP or SM under the Unified Soil Classification System (USCS) (ASTM D2487).
- D. The material shall have the characteristics that when placed and compacted, the soil particles will bind together so as to form a solid, stable surface capable of supporting rubber-tired vehicular traffic during wet weather periods as well as extended dry weather periods. The borrow material shall not contain fines to the extent that the surface layer become "greasy" when wet.
- E. The material shall not contain stones larger than 3/8 inch in diameter.
- F. Material consisting of frozen clogs, ice and snow will be rejected.
- G. All sand borrow material to be used shall be subject to approval by Engineer, and Engineer reserves the right to reject any borrow material from the job that does not meet the above requirements.

2.6 CRUSHED STONE FOR PIPE BEDDING

- A. Shall conform to the requirements of CTDOT, "Form 818" Article M.01.02, No. 6 stone.

2.7 TRAFFIC BOUND GRAVEL FOR GRAVEL ACCESS DRIVEWAY

- A. Shall conform to the requirements of CTDOT, "Form 818" Article M.02.03 and M.02.06, Traffic Bound Gravel.

2.8 ORDINARY BORROW

- A. Ordinary borrow shall have the physical characteristics of soils designated as type GW, GP, GM, SW, SP or SM, under USCS and shall not be specified as gravel borrow, sand borrow, special borrow material or other particular kind of borrow. It shall have properties such that it may be readily spread and compacted for the formation of embankments. The borrow shall not include rocks with a major dimension greater than 8 inches.

2.9 RIPRAP FOR LAGOON SIDEWALLS

- A. Shall conform to the requirements of CTDOT, "Form 818" Article M.12.02 Riprap.

PART 3 EXECUTION**3.1 INSTALLATION**

- A. Prior to the placement of borrow material, site preparation shall be completed as required by the Contract Documents, and approved by the Engineer.
- B. Ensure that all materials are properly stockpiled on site to prevent contamination by other materials.
- C. Place borrow material over the entire area in uniform lifts and compact in accordance with Section 02315.
- D. Utilize on-site soils prior to using off-site borrow provided on-site soils meet the requirements of the specifications.
- E. Utilize standard aggregate borrow in all locations where a surface treatment has not been specified but requires a firm finish surface.
- F. Processed aggregate borrow for pavement subbase is intended to provide a stable foundation for driveways, sidewalk and roadway repair where a gravel base has been specified.
- G. Borrow shall be used as a replacement for unsuitable materials where poor soil conditions are encountered during the progress of the work, where approved by the Engineer. Borrow type will be determined by the Engineer. Borrow material used as a replacement for unsuitable soil is not intended to be an aid to dewatering.
- H. Shape borrow used for pipe foundation material so that it supports the pipe properly and will not damage the pipe, bells, collars, or the pipe fittings.
- I. Place all borrow to keep it free of other materials and to prevent segregation.
- J. Low permeability borrow shall be placed in 6 inch lifts, shall be compacted to 95% of maximum dry density and shall have an in-place permeability of 1×10^{-7} cm/sec or less.
- K. Carry out compaction testing in accordance with ASTM D1556 (sand cone), or D6938 (Nuclear Methods), as specified in Section 02315.
- L. Maintain and repair all eroded areas during the life of this contract at no additional cost to the Owner.

END OF SECTION

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SECTION 02370

SEDIMENTATION AND EROSION CONTROL

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division 1 Specifications, apply to this section.
- B. Contractor is bound to comply with project-related permits obtained by Owner affecting the performance of the work, including all requirements of such permits and representations contained in permit application as though Contractor were the permittee. Requirements and conditions set forth in Owner-obtained project-related permits and permit applications shall be binding on Contractor just as any Specification would be.

1.2 SUMMARY

- A. Related work includes the following:
 - 1. Dust control
 - 2. Drainage and erosion control
 - 3. Haybales and siltation fence
 - 4. Sediment trapping devices
- B. Related Sections
 - 1. Section 02200 – Site Preparation
 - 2. Section 02920 – Lawn and Grasses

PART 2 PRODUCTS

2.1 HAYBALES

- A. Haybales required for siltation control shall be wire tied bales of the type normally used for siltation or erosion control or construction projects.

2.2 FILTER FABRIC

- 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 Mirafi FW404 as manufactured by TenCate Geosynthetics North America; or equal.

2.3 SEDIMENT TRAPPING DEVICES

- A. Sediment trapping devices shall be Siltsack[®], Dandy Bag II[®], or equal.

2.4 MULCH

- A. Hay mulch shall consist of mowed cured grass, clover, alfalfa, timothy, oats, or wheat. No salt hay shall be used.

PART 3 EXECUTION

3.1 DUST CONTROL

- A. Control dust during the Work. Use a mechanical street sweeper as needed or at the request of the Engineer.
- B. Prevent dust from becoming a nuisance or hazard. During construction, excavated material and open or stripped areas are to be policed and controlled to prevent spreading of the material.
- C. Control dust during the work on-site using calcium chloride and/or water.
- D. During the Work on-site, all paved road and driveway surfaces shall be scraped and swept free of excavated materials on a daily basis. The surfaces shall be hosed down or otherwise treated to eliminate active or potential dust conditions and the natural road or wearing surface shall be exposed.
- E. Ensure that the existing equipment, facilities, and occupied space adjacent to or nearby areas of the work do not come in contact with dust or debris as a result of concrete demolition, excavation or surface preparation for coatings.
- F. Control dust by the construction of temporary wooden frame/polyethylene sheeting walls and covering enclosures separating adjacent or nearby areas and equipment from the Work site.
- G. Submit for approval materials proposed for use for dust control, prior to start of the Work.

3.2 DRAINAGE AND EROSION CONTROL

- A. Control erosion and siltation during the construction through mulching, haybales, siltation fencing, diversion and control of storm water run-off, ponding areas and similar methods.
- B. Provide and maintain sediment trapping systems.
- C. Discharge surface runoff from any disturbances to the site into silt containment basins. Utilize siltation prevention measures including haybale and geotextile fences before discharge to drainage systems.
- D. Control surface waters within the construction area through the use of temporary culverts.
- E. Install sediment trapping devices in catch basins located in existing paved areas with sediment trapping devices to minimize the transport of sediment through the subsurface stormwater collection system.

3.3 HAYBALES AND SILTATION FENCE

- A. Place and maintain both haybales and a staked filter fabric siltation fence along the entire length of the proposed construction between the area of construction and where shown on the Drawings or required by permit.
- B. Install haybales by anchoring bales butted together to existing ground with at least 2 stakes per bale. The stake shall be a minimum of 1 inch thick square cross section and shall be long enough to penetrate 12 inches into the ground. Replace deteriorated haybales. Remove and dispose of the haybales following the successful growth of vegetation in the areas disturbed by the construction. Haybales shall not be removed until their removal is approved by the Engineer.
- C. Install a filter fabric siltation fence in addition to the staked haybales, prior to construction and remove after full surface restoration has been achieved. Install the siltation fence parallel and immediately adjacent to the haybales as shown on the Drawings. Install as follows:
 - 1. Hand shovel excavate a small trench on the upstream side of the desired fence line location.
 - 2. Unroll the siltation fence system, position the post in the back of the trench (downhill side), and hammer the post at least 1½ feet into the ground.
 - 3. Lay the bottom 6 inches of the fabric into the trench to prevent undermining by storm water run-off.
 - 4. Backfill the trench and compact.
- D. Perform work in accordance with City of Stafford Springs Conservation Commission Order of Conditions.

3.4 RESTORATION

- A. Provide erosion control, seed and mulch and netting for surface restoration of areas disturbed during construction activities.
- B. Provide temporary stabilization of disturbed areas that remain inactive greater than 14 consecutive days to minimize erosion. Methods to minimize erosion may include but are not limited to:
 - 1. Spreading straw and/or providing temporary planting stabilization.
 - 2. Installing jute netting.
 - 3. Preparing surfaces to increase the runoff flow path, reduce the runoff flow velocity, or create small storage pockets to retain surface flows. Methods of accomplishing this include using mechanical devices such as track equipment or sheep's foot rollers.
- C. Restore the ground surface in brush and/or woodland areas by machine spreading of existing stripped surface soils (loam and humus), liming, fertilizing, seeding and mulching, as well as installing jute netting where required by steep slopes.
- D. Salvage existing loam and topsoil and stockpile this material for re-spreading where originally removed. On backfilling, grading shall be returned to preconstruction

contours and the stockpile of loam shall be spread over areas disturbed during construction activities.

- E. Place mulch on seeded areas. Use jute netting on areas having a slope greater than 3 horizontal to 1 vertical, to anchor the mulch until a satisfactory growth is obtained. If seeding is not possible because of the time of the year, apply mulch and netting to stabilize the area until such time as seed can be sown.
- F. Provide grading, refertilizing, reseeding, remulching and/or netting to maintain the restored areas until the Work is accepted by the Owner.
- G. Seed shall be as specified under Section 02920.

3.5 CLEANING

- A. Remove any sediment that builds up around the haybales or catch basins.
- B. Clean sediment trapping devices periodically during the Work. Devices shall be cleaned on a weekly basis, or more frequently if the devices become clogged.
- C. Clean catch basins that collect sediment as a result of the Work.

END OF SECTION

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SECTION 02514

DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Ductile iron pipe and fittings, direct buried or in below grade vaults
 - 2. Restrained joints and fittings
 - 3. Cast-in-place concrete anchor blocks and thrust blocks
- B. Related Sections
 - 1. Section 02315 – Excavation, Backfill, Compaction and Dewatering
 - 2. Section 02317 – Underground Warning Tape

1.2 REFERENCES

- A. Pipe and fittings shall conform to the latest edition of the following standards unless otherwise specified:
 - 1. ANSI/AWWA C104/A21.4, Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water.
 - 2. ANSI/AWWA C110/A21.10, Ductile Iron and Grey Iron Fittings 3" through 48" for Water and Other Liquids.
 - 3. ANSI/AWWA C111/A21.11, Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
 - 4. ANSI/AWWA C115/A21.15, Flanged Ductile Iron Pipe with Ductile Iron or Gray-Iron Threaded Flanges.
 - 5. ANSI/AWWA C150/A21.50, Thickness Design of Ductile Iron Pipe.
 - 6. ANSI/AWWA C151/A21.51, Ductile Iron Pipe, Centrifugally Cast, for Water.
 - 7. ANSI/AWWA-C153/A21.53, Ductile Iron Compact Fittings Water Service.
 - 8. ANSI/AWWA C600, Installation of Ductile Iron Water Mains and their Appurtenances.
 - 9. ANSI/AWWA C800, Underground Service Line Valves and Fittings.
 - 10. ANSI/AWWA C651, Disinfecting Water Mains.
 - 11. ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - 12. ASTM A536, Standard Specification for Ductile Iron Castings
 - 13. ASTM B88, Standard Specification for Seamless Copper Water Tube.

14. Ductile Iron Pipe Research Association, “Thrust Restraint Design for Ductile Iron Pipe” (Current Edition).

1.3 SUBMITTALS

A. Administrative Submittals

1. Detailed description of proposed pipe handling and installation methods along with the manufacturer’s approval of those methods.
2. Construction details and schedule of Work for each connection to existing piping at least 7 days prior to beginning the Work. Approval must be received before commencement of Work on-site.

B. Shop Drawings

1. Manufacturer’s drawings and catalog cuts, including descriptive literature indicating product characteristics and conformance with specifications and code requirements. Submit shop drawings for ductile iron pipe; fittings; couplings; filling rings; linings and coatings; and all accessories.
2. Location for each type of restrained joint or device to prevent joint separation along with installation, assembly and disassembly instructions.

C. Quality Control Submittals

1. Certificates of compliance on pipe materials.
2. Prior to first shipment of pipe, submit certified test reports that the pipe for this Contract was manufactured and tested in accordance with the ASTM and ANSI/AWWA Standards specified herein.
3. Manufacturer of pipe and Manufacturer of fittings on the project shall have an established, annually audited and certified, quality control procedure for manufacturing of pipe and manufacturing of fittings respectively. Manufacturer shall be certified by an independent, third party auditor for compliance with all requirements of the AWWA standards. The manufacturer shall submit a current certificate of compliance for the plant facility where the pipe or fittings are to be made. Certificate of compliance shall be submitted for each additional year of manufacturing during the duration of the Project. The manufacturer shall not change the plant manufacturing the pipe or fittings during the duration of the Work.

1.4 QUALITY ASSURANCE

- A. All materials shall be manufactured in the United States of America or Canada.
- B. Pipe and fittings shall be inspected at the foundry as required by the standard specifications to which the material is manufactured. In addition, the Owner reserves the right to have any or all pipe, fittings, and special castings inspected and/or tested by an independent service, or by the Engineer, at either the manufacturer’s plant or other testing laboratory at their own expense.
- C. Ductile iron pipe shall be from a single manufacturer. Fittings shall be from a single manufacturer, not necessarily the pipe manufacturer.

- D. The Engineer will inspect the pipe and fittings after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements. Pipe rejected after delivery, or at any point during the progress of the Work, shall be marked for identification and shall immediately be removed from the job site and replaced at no additional cost to the Owner.
- E. Test pipe under pressure for defects and leakage in accordance with Section 02502.

1.5 PROJECT CONDITIONS

- A. Secure permits and pay fees required to carry out the piping work. Comply with laws, ordinances, codes, rules, and regulations of the local and state authorities having jurisdiction over the Work. Where provisions of the Contract Documents are in conflict with the codes, the more stringent shall govern.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. American Cast Iron Pipe Company
- B. U.S. Pipe & Foundry Company
- C. McWane Ductile

2.2 PIPE AND FITTINGS - GENERAL

- A. Ductile iron pipe shall be designed in accordance with AWWA C150 and shall be manufactured in accordance with AWWA C151. Fittings and other materials referenced in this section shall conform to the latest edition of the references listed in Paragraph 1.2 of this section.
- B. Unless otherwise indicated or specified in the Contract Documents, buried ductile iron pipe and fittings shall be Class 52 with push on joints, and with restraint.
- C. Unless otherwise indicated or specified, buried pipe shall have an asphaltic exterior coating in accordance with AWWA C110, C151 or C153, as applicable.
- D. Unless otherwise indicated or specified in the Contract Documents, buried fittings shall be ductile iron with mechanical joints.
- E. Unless otherwise indicated or specified in the Contract Documents, ductile iron pipe and fittings installed above ground and/or in buried vaults, shall be Class 54 with 125# flanges.
- F. Exposed piping shall be shop primed and painted in the field in accordance with manufacturer's recommend for this application. Exposed piping to be painted shall not have an asphaltic exterior coating applied.
- G. Pipe and fittings shall be double cement mortar-lined and double bituminous seal coated on the interior in accordance with AWWA C104.

2.3 PIPE AND FITTING JOINTS

- A. Push-on-joints and mechanical joints shall conform to ANSI/AWWA C111/A21.11.
- B. Flanged joints shall be assembled with bolts and nuts, bolt studs with nut on each end, or studs with nuts in tapped flanges. Bolts and nuts shall be manufactured in accordance with ASTM A325, Type 1, Grade 5, hot-dipped galvanized finish, heavy hex head,

120,000 psi minimum tensile strength with X-Heavy nuts. Nuts and bolts shall be provided with an anti-seize, thread lubricating compound.

- C. Gaskets for flanged joints shall be full face, 1/8 inch red rubber. Ring gaskets shall be provided for piping 14 inches in diameter and larger.
- D. Gaskets shall meet the material requirements of ANSI/AWWA A21.11/C111 for mechanical joint gaskets.
- E. Provide EBAA Megalug 1100 for all fittings, and for mechanical joint pipes or approved equal.

2.4 FITTINGS

- A. Fittings shall be ductile iron.
- B. Fittings less than or equal to 12 inches in size shall conform to ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53 and shall have a 350 psi pressure rating.
- C. Mechanical joint retainer glands shall be installed on all mechanical joints. Retainer glands shall be specifically designed to fit standard mechanical joint bells with corrosion resistant, high strength, low-alloy T-head bolts conforming to ANSI/AWWA A21.11/C-111 and ANSI/AWWA A21.53/C-153. Retainer glands shall be manufactured of ductile iron conforming to ASTM A536-80, grade 60-42-10. Wedges shall be of hardened ductile iron and require the same torque in all sizes. These devices shall have a 350 psi pressure rating and shall be EBAA IRON, Inc., Megalug® series 1100 or equal. Glands shall be listed with Underwriters Laboratories and/or approved by Factory Mutual.

2.5 GASKETS, GLANDS, NUTS, AND BOLTS

- A. Gaskets, glands, nuts, bolts and accessories shall conform to ANSI/AWWA C111/A21.11 or C153/A21.53, as appropriate.
- B. Gaskets shall be of plain tipped rubber, suitable for exposure to the liquid within the pipe.
- C. Glands shall be ductile or cast iron.
- D. Bolts shall be high strength, low alloy.
- E. Requirements for flanged joints:
 - 1. Gaskets for flanged joints shall be full faced red rubber, 1/8 inches thick. Gaskets shall conform to the dimensions of Table A.1 of ANSI/AWWA C115/A21.15. Ring gaskets shall be utilized for joints 14 inches in diameter and larger.
 - 2. Assemble flanged joints with bolts and nuts, bolt studs with nut on each end, or studs with nuts in tapped flanges. Bolts and nuts shall be of low carbon steel conforming to the chemical and mechanical requirements of ASTM A307, 60,000 psi tensile strength, Grade B. Bolts, nuts and studs shall be cadmium plated.

2.6 THRUST BLOCKS AND ANCHOR BLOCKS

- A. Concrete shall have a 28-day compressive strength of 3,000 psi.

PART 3 EXECUTION**3.1 GENERAL**

- A. Deliver, handle, store and install ductile iron pipe in accordance with ANSI/AWWA C600.

3.2 DELIVERY, STORAGE AND HANDLING**A. Delivery of Pipe and Fittings**

1. Coordinate delivery of pipe and fittings with installation and unload along the line of work outside the trench near as practicable to the point of final placement, and properly wedged secure. Give minimum 24 hour notice to the Engineer prior to pipe deliveries. Notice shall include the method of unloading.
2. Unload and handle pipe and fittings with a crane or backhoe of proper capacity outfitted with a steel cable sling, belt sling or other specially designed attachment to protect the pipe coating.
3. At the end of each work week, no more than the amount of pipe to be installed the following work week shall remain along the construction route. All pipes remaining along the construction route are to be properly wedged to prevent movement and not interfere with traffic or pedestrian movement. All excess pipes are to be stockpiled at an approved staging yard in accordance with AWWA C600.

B. Storage of Materials

1. Store pipe in a manner to keep pipe interior free from dirt and foreign matter. Store pipe on wood blocking, rails or other suitable materials. Pipe shall not be stored on stones.
2. Pipe may be stored on top of each other to the maximum stacking height specified by AWWA C600.
3. Protect materials subject to corrosion in accordance with manufacturer's recommendations.
4. If pipe or project materials are stored at the Contractor's approved staging yard, the Engineer shall be permitted reasonable access to the staging yard for inspection of the pipe and materials.
5. Pipe ends shall be sealed tight using polyethylene bags and tape immediately after unloading, regardless of the storage time length, in order to keep foreign matter and wind blown debris out.
6. All fittings are to be stored off of the ground on wooden pallets.

C. Handling Materials

1. Handle materials in such a manner so as to prevent damage to the concrete or mortar coating or lining.
2. Materials are to be handled using methods approved by the pipe manufacturer.
3. Materials damaged during handling will be rejected and shall be replaced at the Contractor's expense.

4. Ensure that no foreign materials enter the pipe and fittings during handling.

3.3 DEFECTIVE PIPE

- A. The Engineer reserves the right to reject all defective pipe shipped to the job site or stored on the site. The Engineer will examine the pipe and determine if the pipe is damaged prior to installation of the pipe. Defective pipe or fittings will be rejected for use on this project. Defective pipe is classified as follows:
 1. Damage to interior lining
 2. Insufficient lining thickness
 3. Pipe out of round
 4. Damaged pipe barrel area
 5. Damaged pipe bells or spigots
 6. Missing, misplaced or illegible marking and identification
 7. Outside pipe diameter exceeding allowable tolerance
- B. If defective pipe is discovered after it has been installed, it shall be removed and replaced with sound pipe, at no additional cost to the Owner.

3.4 JOB CONDITIONS

- A. Environmental Requirements
 1. Do not lay pipe when weather conditions are unsuitable, as determined by the Engineer, for pipe laying work.
 2. Equipment for pipe laying shall be maintained in good operating order.
 3. Job site shall be kept clean of debris and organized.
- B. Protection
 1. At all times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer. This provision shall apply at all times when pipe laying operations are suspended.
 2. Temporary Bulkhead
 - a. Install approved temporary bulkhead on end of pipe at end of the day's work and when pipe laying is not actively in progress.
- C. Work Affecting Existing Pipelines
 1. Location of Existing Pipelines:
 - a. Location of existing pipeline shown on the Drawings shall be considered approximate.
 - b. Contractor is responsible for determining the exact location of existing piping to which he shall make connections, or which he may disturb during earth moving operations, or which may be affected by his work in any way.

2. Work on Existing Pipelines:
 - a. Prior to any work on existing pipelines, remove soils, rust and other debris from the exterior wall of the pipe a minimum of 12 inches beyond the work area.
 - b. Cut pipes as shown or required with machines specifically designed for this work.
 - c. Install temporary plugs to keep out all mud, dirt, water and debris.
 - d. Provide necessary adapters, fittings, pipe and appurtenances required.
 - e. Cut or tap existing mains at the mid span of a pipe barrel. In no case shall a pipe be cut or tapped within 24 inches of a pipe joint.

3.5 CLEANING PIPE AND FITTINGS

- A. Clean and remove foreign matter from the interior of each pipe and fitting before placing in the trench. Remove pipe and fittings whose interior has been contaminated with oil, gasoline or kerosene and replace at no additional cost to the Owner. Remove pipe and fittings whose interior has been contaminated with any material which is a regulated drinking water contaminate or which damages the cement and replace at no additional cost to the Owner. Should foreign material or contaminants be observed in previously installed pipe, cease work until foreign material or contaminated pipe is decontaminated or removed.
- B. Remove all lumps, blisters, and excess asphaltic coating from the bell and spigot ends of each pipe or fitting. The outside of the spigot and the inside of the bell shall be wire-brushed and wiped clean and be dry and free from oil and grease before the pipe or fitting is laid.
- C. On all ductile iron pipe or fittings, the bell of the pipe and the spigot of the adjacent pipe or fitting shall be wire-brushed and cleaned of rust and dirt. The bell of the pipe or fitting and the spigot of the adjacent pipe shall then be lubricated with the joint lubricant furnished with the pipe, and used in accordance with the manufacturer's directions.

3.6 ALIGNMENT AND GRADE

- A. Lay and maintain the pipe at the required lines and grades as shown on the Drawings. Fittings shall be at the locations indicated on the Drawings with joints centered, and spigots properly fitted. No deviation shall be made from the line and grade indicated on the Drawings, except with the approval of the Engineer.
- B. Joint Openings and Deflection:
 1. The maximum allowable joint openings and deflection for push-on joint pipe and restrained joint pipe shall be one-half the manufacturer's maximum allowable opening and deflection.
 2. Radius curves indicated on the Drawings or approved during Shop Drawing review shall be made using full lengths of pipe. The use of short lengths of pipe and extra joints in order to make a smaller radius turn will not be allowed without the written approval of the Engineer.
- C. Line or Grade Conflicts with Other Structures

1. Wherever obstructions not shown on the Drawings are encountered during the progress of the Work and interfere to such an extent that an alteration in the pipe layout is required, the Engineer will order a deviation from the line and grade at locations where obstructions such as culverts, ducts, wire and/or pipes are encountered. The pipe shall be laid over or under such obstacles with a minimum clearance of 6 inches. The Engineer reserves the right to make the decision to go over or under obstructions during construction.
- D. Where underground conditions indicate a change of alignment or grade, such change shall be made only with the written consent of the Engineer.
- E. Except at locations indicated on the Drawings by the profile, do not establish high points where air can accumulate.

3.7 PIPE INSTALLATION

A. General Requirements

1. Prepare the pipe trench in accordance with Section 02315.
2. Keep trenches dewatered while installing pipe until all required pipe joints have been made and the trench has been backfilled above the water table to a point where pipe uplift will not occur when the pipe is empty.
3. Carefully lower pipe and fittings into the trench piece by piece by means of a crane, ropes or other tools or equipment, in such a manner as to prevent damage to pipeline materials and protective coatings and linings. Under no circumstances shall pipeline materials be dropped or dumped into the trench.
4. Carefully inspect pipe and fittings for cleanliness and defects prior to placing them in the trench.
5. Install underground warning tape over the pipe in accordance with Section 02317.

B. Laying Pipe

1. Prepare the pipe trench in accordance with Section 02315.
2. Install pipe with a minimum of 5 feet of cover, unless indicated otherwise on the Drawings or directed by the Engineer.
3. Prevent foreign material from entering the pipe while it is being placed in the line. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe.
4. When laying pipe, the spigot end shall be centered in the bell, the pipe forced home and the joint completely assembled. The pipe shall be adjusted to correct line and grade and secured in place with approved backfill material, properly tamped under and around the pipeline.

C. Cutting Pipe

1. Furnish pipe in full lengths. Cut ductile iron pipe without damage to the pipe or cement lining. The cutting shall be done to leave a smooth end at right angles to the axis of the pipe.

2. Cut ductile iron pipe either by the use of compression-type chain cutters which exert an even continuous force on the wall of the pipe or by power driven abrasive wheels.
3. On ductile iron pipe using rubber joints, the outside edge of the cut end must be tapered back approximately $\frac{1}{4}$ inch at an angle of about 30 degrees so as to provide for the proper assembly of this joint.

3.8 PUSH-ON JOINTS

- A. Push-on joints shall be made in accordance with the manufacturer's instructions. Install gaskets in the pipe bell after lowering the pipe into the trench for installation. Thoroughly clean the bell and spigot of dirt and tar blisters in the trench utilizing a wire brush or bristle brush. Insert rubber gasket in the groove of the bell end of the pipe beginning at the bottom of the bell and working to the top of the bell. Apply lubricant per the manufacturer's recommendations utilizing a paint brush to the pipe gasket and the pipe spigot to be joined. Place a clean rag under the joint to protect the joint from dirt caused by unintentional grounding of the pipe during jointing. Upon completion, remove the rag. Align the plain end of the pipe to be laid and insert in the bell of the pipe to which it is to be joined and push home with a jack or by other means. After joining the pipe use a metal feeler to make certain that the rubber gasket is correctly located.

3.9 MECHANICAL JOINTS

- A. Mechanical joints shall be made in accordance with Appendix A of ANSI A21.11/AWWA C111 and the manufacturer's instructions. Thoroughly clean and lubricate the joint surfaces and rubber gasket before assembly. Tighten bolts to the specified torques. Under no conditions shall extension wrenches or an extended handle ratchet wrench be used to secure greater leverage.

3.10 RESTRAINED JOINTS

- A. Install restrained joint pipe where indicated on the Drawings. Make the joint assemblies in accordance with the manufacturer's recommendations.

END OF SECTION

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SECTION 02820

CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.1 SCOPE

- A. The work of this section includes all labor, materials, tools, and equipment necessary to furnish and install chain link fencing and gates as specified herein and as shown on the drawings.

1.2 SUBMITTALS

- A. Shop drawings and brochures shall be submitted for all items to be furnished.
- B. Submittals required under this section shall include, but are not limited to the following:
 - 1. Materials brochures.
 - 2. Fabric and post samples showing size, color, and finish.
 - 3. Drawings showing height of fence, width of gates, sizes and types of materials used for entire fencing system.
- C. Data indicating compliance with these specifications for the fabric, posts, accessories,
- D. Two fence samples complete with all typical hardware and components. The samples shall be representative of the type of construction for the project and color of all components.

1.3 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.
- B. Supply material in accordance with CLFMI – Product Manual.
- C. Perform installation in accordance with ASTM F567.
- D. Furnish a 10-year factory warranty against corrosion and rust for the entire fencing system.

1.4 PRODUCT HANDLING

- A. Deliver fence fabric and accessories in packed cartons or firmly tied rolls.
- B. Packages shall be labeled with the manufacturer's name.
- C. Store fence fabric and accessories in a secure and dry place.

PART 2 PRODUCTS

2.1 MATERIALS

- A. General. The entire chain link fence and gate system, including posts, braces, and couplings, shall be:
1. Vinyl coated galvanized steel. The color of the vinyl coating shall be selected from manufacturer's samples by the Engineer.
- B. Fabric shall be No. 9 gauge core wire, vinyl-coated galvanized steel wire, woven into a 1-inch mesh. Minimum weight of zinc coating shall be 0.30 ounces per square foot. Minimum thickness resulting in overall thickness of 6 gauge of PVC coating shall be 0.006 inches and maximum shall be 0.010 inches. PVC coating shall be thermally fused and bonded to a primer, which is thermally cured into galvanized steel wire. Minimum breaking strength shall be 1,290 pounds. Fabric shall be of the height shown on the drawings.
- C. The chain link fabric shall be securely fastened to all terminal posts using 3/16 inch by 3/4 inch tension bars and heavy 11 gauge tension bands. One band shall be furnished foot in the height of fence. The fabric shall be fastened to all intermediate posts with 9 gauge tie wires, spacing not to exceed 24 inches. All fabric connectors shall be of galvanized steel conforming to the applicable requirements of ASTM A153. Fabric height shall be approximately 6 feet.
- D. All posts, railings, and couplings used in the construction of the fence (except double leaf gate posts) shall conform to ASTM A120, Schedule 40. All posts, rails, and couplings shall be hot dipped galvanized steel conforming to the applicable requirements of ASTM A123 and of the nominal sizes and weights specified herein SS40 posts will also be accepted. The pipe sizes shall conform to the nominal sizes specified herein and shall be of sufficient length to extend 48 inches into concrete footing. All posts shall be equipped with tops to exclude moisture.
1. The intermediate posts shall be 2-1/2 inches OD pipe.
 2. All end, corner, pull, and single leaf gate posts shall be 3 inches OD pipe and trussed and braced.
 3. Cantilever gate posts shall be 4 inches OD round post pipe and shall be equipped with tops designed to exclude moisture.
 4. The top, bottom, and the intermediate rail shall be 1-5/8 inches OD pipe provided with couplings approximately every 20 feet. Couplings shall be outside sleeve type at least 7 inches long. The top rail shall pass through the line post tops and form a continuous brace from end to end of each stretch of fence. The top rail shall be securely fastened to the terminal posts by heavy pressed steel brace bands and malleable rail end connections. The line posts tops, brace bands, and rail end connections shall be galvanized according to ASTM A153.
 5. Double leaf gates shall have truss rods or intermediate braces. Gate fabric shall be attached to gate frame by methods standard with the manufacturer except that welding will not be permitted. Latches shall be arranged for padlocking so that padlock will be accessible from both sides of the gate regardless of the latching arrangement. Gate frames shall be 2 inch OD galvanized steel pipe. Gate fabric shall conform to the requirements specified hereinbefore. All gates

shall be equipped with a positive type latching device with a means for padlocking. Hinges shall be of pressed steel.

6. All hardware fittings shall be pressed galvanized steel in conformance with ASTM F226.
7. Total fence height shall be 6 feet.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Installation shall be made by skilled mechanics experienced in erection of this type of fence. All posts shall be set in concrete foundations to a minimum depth of 48 inches. Diameter of the foundation shall be pipe OD plus 12 inches. The foundation shall be a 1-2-4 mixture of concrete and shall be 54 inches deep, minimum. All foundations shall extend approximately 1 inch above grade and shall slope away from the post to provide for proper draining. Edge of foundation shall be flush with finish grade. Foundations shall be of the shape and sizes shown on the drawings.
- B. Line posts shall be spaced at a maximum of 10-foot intervals. Intermediate rails shall be used to brace end and gate posts to the adjacent line post, and corner posts to the two (2) adjacent line posts. Changes in line of 30 degrees or more shall be considered corners.
- C. Top rails shall pass through the line tops of each line post, forming a continuous brace from end to end of each stretch of fence. Lengths of top of rail shall be jointed by sleeve type couplings. Top rails shall be securely fastened to terminal posts by pressed steel fittings.
- D. Chain link fabric shall be placed on the fence of the post outside the enclosed areas. The fabric shall be placed approximately two inches above the ground and on a straight grade between posts. The fabric shall be stretched taut and securely fastened to the posts. Fastening to end, gate, and corner posts shall be with stretcher bars and fabric bands spaced at one-foot intervals. Rolls of wire fabric shall be joined by weaving a single strand into the ends of the rolls to form a continuous mesh. Chain link fabric shall be fastened to the end bars of the gate frame by stretcher bars and fabric brands, and to the top and bottom bars of the gate frames by tie wires in the same manner as specified for the chain link fabric; or by other standard methods if approved by the Engineer. Vinyl fabric shall be protected from abrasion during shipping, storage, and installation. Any abraded areas of fence shall be replaced or protected by painting with a matching PVC paint.

END OF SECTION

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SECTION 02920

LAWNS AND GRASSES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Restoration of all vegetated areas disturbed during construction including:
 - a. Lawn areas
 - b. Grass surfaces
 - 2. New loam and seed areas
 - 3. Loam, starter fertilizer, lime, lawn seed, and hydric seed
 - 4. Mulch

1.2 SUBMITTALS

- A. Lawn seed mixture including percent by weight of each seed type, and manufacturer/Supplier name.
- B. Suitable laboratory analysis of the topsoil to determine the quantity of fertilizer and lime to be applied.
- C. Lime and starter fertilizer application rates based on laboratory soil tests.
- D. A sworn certificate indicating each variety of seed, weed content, germination of seed, net weight, date of shipment and manufacturer's name shall accompany each seed shipment.

1.3 QUALITY ASSURANCE

- A. Place seed only between the periods from April 15th to June 1st, and from August 15th to October 1st, unless otherwise approved by the Engineer.
- B. A Certificate of Clean Fill must be provided to Engineer and Owner for approval prior to delivery of any and all fill material including but not limited to, mineral soil, borrow material, structural fill, processed fill material, loam, or top soil to be placed on site during the course of the Work. The Certificate must include laboratory analytical reports for all material to be used at the site on a basis of one sample per every 500 cubic yards or lesser portions thereof. Analytical reports must demonstrate that the proposed material does not contain detectable concentrations of contaminants including but not limited to; petroleum hydrocarbons, semi volatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), pesticides, and/or herbicides and that metals listed in the Connecticut Remediation Standard Regulations do not exceed minimal concentrations deemed allowable by Engineer and Owner. No fill material shall be placed on site until Contractor has received approval from Engineer and/or Owner. Engineer and Owner reserves the right to collect and analyze samples from any proposed fill material prior

to or after delivery to the site and to allow use of off-specification material at their sole discretion.

The Certificate must clearly state the following and be signed by an authorized signatory employed by the Contractor:

1. Volume of material to be used
2. Process by which the material was obtained
3. Location of origin and summary of current and past site uses of the location of origin
4. Statement from Contractor that the analytical reports included with the Certificate represent the specific material to be used at the site
5. Statement that the Contractor does not know or have reason to believe that the proposed fill material contains foreign materials or contaminants.

PART 2 PRODUCTS

2.1 MATERIALS

A. Loam

1. Loam from offsite, as required for Work, shall be taken from a well-drained, arable site, and shall be free of subsoil, large stones, earth clods, sticks, stumps, clay lumps, roots or other objectionable, extraneous matter or debris. Loam shall also be free of quack-grass rhizomes, *Agropyron Repens*, and the nut-like tubers of nutgrass, *Cyperus Esculentus*, and all other primary noxious weeds. Loam shall not be delivered or used for planting while in a frozen or muddy condition. Topsoil as delivered to the Site or stockpiled shall have pH between 6.0 and 7.0 and shall contain not less than 5 percent or more than 8 percent organic matter as determined by loss of ignition of moisture-free Samples dried at 100 degrees Celsius.
2. Onsite loam may be available from stripping of onsite topsoil. Onsite topsoil shall be tested as specified below and shall be amended as necessary to meet Specification requirements for loam.
3. Soil Analysis: The Contractor shall submit representative Samples of loam, which he intends to bring onto the Site, and Samples of loam from onsite sources, to a Soil and Plant Testing Laboratory acceptable to the Engineer. All reports shall be sent to the Engineer for approval. Samples of loam to be brought to the Site must be approved prior to delivery of soil. Deficiencies in the loam shall be corrected by the Contractor, as directed by the Engineer after review of the testing agency report by a soils consultant. Testing reports shall include the following tests and recommendations.
 - a. Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System.
 - b. The silt clay content shall be determined by a Hydrometer Test.

- c. Percent of organics shall be determined by an Ash Burn Test or Walkley/Black Test.
 - d. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Soluble Salts, and acidity (pH).
 - e. Soil analysis tests shall show recommendations for soil additives to correct soils deficiencies as necessary, and for additives necessary to accomplish particular lawn and planting objectives noted.
 - f. All tests shall be performed in accordance with the current standards of the Association of Official Agriculture Chemists.
4. Loam for General Lawn and Site Restoration Areas: Loam shall conform to the following grain size distribution for material passing the #10 sieve:

U.S. Sieve Size Number	Percent Passing	
	Minimum	Maximum
10	100	----
18	84	100
35	63	72
140	26	40
270	22	34
0.002 mm	2	5

¹The ratio of the particle size for 80% passing (D₈₀) to the particle size for 30% passing (D₃₀) shall be 6 or less (D₈₀/D₃₀ < 6).

²Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample.

³Tests shall be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

⁴The organic content shall be between 4.0 and 6.0 percent.

B. Typical Sand Amendment

- 1. Sand to be mixed with topsoil shall meet the following requirements. The material shall be uniformly graded coarse sand consisting of clean, inert, rounded grains of quartz or other durable rock and free from loam or clay, surface coatings, mica, other deleterious materials with the following gradation.

U.S. Sieve Size Number	Percent Passing	
	Minimum	Maximum
10	100	----
18	60	80
35	35	55

60	8	20
140	0	8
270	0	3
0.002 mm	0	0.3

¹Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 10% by weight of the total sample.

²The ratio of the particle size for 70% passing (D_{70}) to the particle size for 20% passing (D_{20}) shall be 3.0 or less ($D_{70}/D_{20} < 3.0$).

³Tests shall be combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

C. Starter Fertilizer

1. Starter fertilizer shall bear the manufacturer’s name and guaranteed statement of analysis and shall be applied in accordance with the manufacturer’s directions.
2. Starter fertilizer shall be Scott’s Starter Fertilizer, or equal, with timed nitrogen release to prevent burning.

D. Lime

1. Lime shall be an agricultural type ground limestone.
2. Lime shall be pelletized type for prolonged time release to soil.
3. Lime shall be applied at the rates recommended in the soil analysis.

E. Seed

1. Seed shall be of the previous year's crop.
2. Required properties:
 - a. Purity > 90%
 - b. Germination > 80%
 - c. Crop < 0.5%
 - d. Weed < 0.3%
 - e. Noxious Weed – 0%
 - f. Inert < 8%
3. Grass seed shall conform to the following mixtures in proportion by weight and weed content and shall pass the minimum percentages of purity and germination as indicated for same.

Open Field Mix	% Weight
Red Fescue (Creeping)	60%
Red Top	10%

Crown Vetch

30%

4. All seed shall comply with State and Federal seed Laws and Regulations.

PART 3 EXECUTION

3.1 RESTORATION

- A. In locations where the Work passes through existing grass, weed brush or tree-surfaced areas that are not covered by a specific lawn repair item, surface restoration shall be as follows:
 1. After completion of backfilling, the existing loam and organic ground cover materials that were salvaged during excavation shall be returned to the top of the trench.
 2. After natural settlement and compaction has taken place, the trench surface shall be harrowed, dragged and raked as necessary to produce a smooth and level surface.
 3. The area is then to be sowed with “orchard grass” or “rye grass” or other such materials to hold the soil and produce a growth similar to that existing prior to construction.

3.2 PREPARATION

- A. After rough grading of the subgrade has been completed and approved, the subgrade surface shall be scarified to a depth of four (4) inches. Then furnish and install a layer of loam providing a rolled four (4) inch thickness. Any depressions which may occur during rolling shall be filled with additional loam, regraded and rerolled until the surface is true to the finished lines and grades. All loam necessary to complete the Work under this section shall be supplied by the Contractor.
- B. The ground surface shall be fine graded and raked to prepare the surface of the loam for lime, fertilizer and seed.
- C. The loam shall be prepared to receive seed by removing stones and grading to eliminate water pockets and irregularities prior to placing seed. Finish grading shall result in straight uniform grades and smooth, even surfaces without irregularities to low points.
- D. All stones over one-half (1/2) inch in diameter remaining on the surface after raking shall be removed.
- E. Shape the areas to the lines and grades required. The Contractor's attention is directed to the scheduling of Loaming and Seeding of graded areas to permit sufficient time for the stabilization of these areas.
- F. All areas disturbed by construction within the property lines and not covered by structures, pavement, or bark mulch shall be loamed and seeded.
- G. Limestone shall be thoroughly incorporated into the loam layer at a minimum rate of 3 ton per acre or more as recommended by the loam analysis in order to provide a pH value of 5.5 to 6.5.

- H. Fertilizer shall be spread on the top layer of loam at the minimum rate of 500 pounds per acre or more as recommended by the loam analysis and worked into the surface

3.3 LOAM AND SEED AREAS

- A. For temporary protection of disturbed areas, seed shall be applied at the following rates:

Winter Rye (fall seeding)	2.5 pounds per 1,000 square feet
Oats (spring seeding)	2.5 pounds per 1,000 square feet
Mulch	1.5 tons per acre

- B. The seed mixtures shall be applied at a minimum rate of 200 pounds per acre, or 4.5 pounds per 1,000 square feet.

- C. Seed shall be sown at the rates indicated above by rotary or drop spreader. Sowing shall be done on a calm, dry day. Immediately before seeding, the soil shall be lightly raked. One half the seed shall be sown in one direction and the other half at right angles to the original direction. It shall be lightly raked into the soil to a depth not over 1/4 inch and rolled with a hand roller weighing not over 100 pounds per linear foot of width.

1. Straw mulch shall be applied immediately after seeding at a rate of 1.5 to 2 tons per acre. Mulch that blows or washes away shall be replaced immediately and anchored using appropriate techniques.
2. The surface shall be watered and kept moist with a fine spray as required, without eroding the soil, until the grass is well established. Any areas, which are not satisfactorily covered with grass, shall be reseeded, and all noxious weeds shall be removed.

- D. Unless otherwise approved, seeding shall be done between the periods from April 15th to June 1st, and August 15th to October 1st, when soil conditions and weather are suitable for such Work.

3.4 MAINTENANCE

- A. Maintenance shall include watering, weeding, removal of stones and other foreign objects over one half (1/2) inch in diameter, cutting the grass until final acceptance. Mow at least weekly, removing no more than 30-40 percent of the leaf tissue using well sharpened blades. Mow grass between one (1) and two (2) inches high in the spring and fall. Mowing heights shall be an additional one-half to an inch in the summer to reduce temperature stress. Leave the clippings in place to help recycle essential plant nutrients needed for growth. All bare or dead spots which become apparent shall be properly prepared, re-loamed, limed, aerated, fertilized, and reseeded as many times as necessary to secure a good growth. The entire area shall be maintained, watered and cut until final acceptance of the lawn installation.

- B. The dressed and seeded areas shall be sprinkled with water as necessary from time to time. Signs and barricades should be placed to protect the seeded areas.

- C. To be acceptable, seeded areas shall consist of a uniform stand without bare or dead spots of at least 90 percent established permanent grass species, with uniform count of at least 200 plants per square foot.
- D. The Engineer shall determine whether maintenance shall continue in any part.
- E. After all necessary corrective Work and clean-up has been completed, and maintenance instructions have been received by the Owner, the Engineer will certify in writing the acceptance of the lawns.
- F. Substantial Completion will not be achieved until the seeded areas have demonstrated a satisfactory stand of growth as determined by the Engineer. Seeded areas not demonstrating satisfactory stands as outlined above, as determined by the Engineer, shall be renovated, reseeded and maintained meeting all requirements as specified herein.

END OF SECTION

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