North Lake Cochichewick Boat Launch

May 2025



PREPARED FOR: Town of North Andover, MA



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DIVISION 0

BIDDING AND CONTRACT REQUIREMENTS

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SECTION 00020

INVITATION TO BID

- 1. The Town of North Andover, Massachusetts, the Awarding Authority, invites sealed bids for the **North Lake Cochichewick Boat Launch, Town of North Andover, Massachusetts** project in accordance with the documents prepared by Apex Companies, LLC., attached hereto and incorporated herein.
- Sealed Bids will be received until 11:00 a.m. prevailing time on Thursday June 12, 2025. All bids shall be submitted online at <u>www.Projectdog.com</u> ("ProjectDog") for the Invitation to Bid entitled "North Lake Cochichewick Boat Launch, Town of North Andover, Massachusetts". All electronic bids are compiled in real time upon bid close and published forthwith on ProjectDog. Official bid tabulations shall be posted on ProjectDog.
- 3. The work under this Contract includes, but is not necessarily limited to the reconstruction of the existing boat launch with a permeable paver boat launch, reconstruction of the lakeside retaining wall with a mechanically stabilized earth (MSE) concrete block retaining wall, permeable paver driveways and parking areas, stormwater control measures (SCMs), loam and seeding, native tree plantings, and all necessary appurtenances and incidentals to complete the project.
- 4. This project is being Electronically Bid (E-Bid). All bids shall be submitted online at <u>www.Projectdog.com</u>. <u>Hard copy bids will not be accepted by the Awarding Authority</u>. Tutorials, instructions, and videos on how to complete the electronic bid documents are available online as well as in Section 00100 Instructions to Bidders and Supplemental Instructions to Bidders for Electronic Bid Projects. For assistance, contact Projectdog, Inc. at (978) 499-9014.
- 5. Bid forms and contract documents are available online at <u>www.Projectdog.com</u> starting Wednesday May 21, 2025. at 12:00 pm. Enter Project Code 867468 in the project locator box and select "Acquire Documents" to download documents or to purchase hard copies. New users to Projectdog.com must first select <u>Sign Up</u> to create an online account. Contract documents may also be viewed, but not removed, from the offices of Projectdog, Inc., 18 Graf Road Unit 8, Newburyport, MA 01950, Monday Friday, 8:30 a.m. to 5:00 p.m.
- 6. Any and all addenda shall be posted online at Projectdog.com. Each individual or firm recorded as having received the contract documents will be notified by email if and when addenda are issued. Hard copies of addenda will not be mailed or faxed to plan holders. It is the sole responsibility of the Bidder to review any and all addenda prior to the bid opening either online or at the offices of Projectdog, Inc.
- 7. All documents shall be submitted in PDF format only. All bidders must complete and digitally sign (Adobe) or print, complete, sign and scan bid form Signature page(s) and upload as a PDF file.
- Construction must be complete within 90 calendar days from and including issuance of a notice to proceed, and/or receipt of fully executed contract. Construction shall be final complete within 150 calendar days from and including issuance of a notice to proceed. All in-water work shall

N. Lake Cochichewick Boat Launch North Andover, MA

INVITATION TO BID 00020-1 be completed within the time of year restriction outlined in the project permits. The Town of North Andover anticipates executing the contract in **July 2025**, and no more than ninety (90) calendar days after the actual date of the opening of the Bids.

- 9. Contract payment will be by the unit price method or the lump sum method as indicated on the Bid Proposal. No Bidder may withdraw his/her Bid for a period of ninety (90) calendar days after the actual date of the opening of the Bids. Based on the contract price, the Owner may delay executing the contract until July 2025 or later until funding is available.
- 10. Bidders shall certify that they do not, and will not, maintain or provide for their employees any facility that is segregated on a basis of race, color, creed, sex, national origin, or sexual preference.
- For minimum qualifications of Bidders, refer to the Instructions to Bidders, Section 00100, Article
 3.
- 12. Each bid shall also be accompanied by a bid security in the form of a certified, treasurer's or cashier's check, bid bond or cash in the amount of five (5) percent of the value of the Bid.
- 13. Minimum Wage Rates as determined by the Commissioner of Department of Workforce Development under the provision of the Massachusetts General Laws, Chapter 149, Section 26 to 27D, as amended, apply to this project. It is the responsibility of the contractor, before bid opening, to request if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed work under this contract.
- 14. Successful bidder must furnish 50 percent Construction Payment Bond with a surety company acceptable to the Owner.
- 15. The bidding and award of the Contract shall be in full compliance with Section 39M of Chapter 30 of the General Laws of the Commonwealth of Massachusetts as last revised.
- 16. The successful bidder must provide a \$20,000 Cash Bond directly to the North Andover Conservation Commission (NACC) as noted in the NACC Order of Conditions (OOC).
- 17. The Contract will be awarded to the bidder deemed by the awarding authority to be the lowest responsible and eligible bidder. The Owner reserves the right to waive any informality, to accept or reject, in whole or in part, any or all bids, or take whatever action may be deemed to be in the best interest of the Town of North Andover, Massachusetts.
- 18. The Owner also reserves the right to omit part or whole of any proposed work to be performed, as shown on the Contract Drawings, as may be required to maintain the total cost of work within available funds.

END OF SECTION 00020

DOCUMENT 00100

INSTRUCTIONS TO BIDDERS

INDEX

- 1. Receipt and Opening of Bids
- 2. Preparation of Bid
- 3. Subcontracts
- 4. Telegraphic Modification (NOT USED)
- 5. Qualifications of Bidders
- 6. Bid Security
- 7. Liquidated Damages for Failure to Enter into Contract
- 8. Time of Completion and Liquidated Damages
- 9. Conditions of Work
- 10. Addenda and Interpretations
- 11. Security for Faithful Performance
- 12. Power of Attorney
- 13. Notice of Special Conditions
- 14. Laws and Regulations
- 15. Site Examination
- 16. Obligation of Bidder
- 17. Minimum Wage Rates
- 18. Manufacturer's Experience
- 19. Equal Products Acceptable
- 20. Sales Tax Exemption
- 21. Guarantee
- 22. Bonding and Insurance
- 23. Health and Safety Regulations
- 24. Buy American
- 25. Access to the Project
- 26. Traffic Police
- 27. Third Party Work

1. Receipt and Opening of Bids:

The North Andover Department of Public Works (herein called the "Owner") invites bids on the form attached hereto, all blanks of which must be appropriately filled in. All bids shall be submitted electronically online at www.Projectdog.com no later than the date and time specified. No hard copy bids will be accepted. All electronic bids are compiled in real time upon bid close and published forthwith on ProjectDog. Official bid tabulations shall be posted on ProjectDog. The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No Bidder may withdraw a bid within thirty (30) calendar days after the actual date of the opening thereof.

2. Preparation of Bid:

Bids shall be submitted electronically at www.Projectdog.com as appropriate and at no cost. There are PDF and video tutorials available online. For additional assistance call Projectdog, Inc 978-499-9014.

All bidders must complete and digitally sign (Adobe) or print, complete, sign and scan bid form Signature page(s) and upload as a PDF file. All documents must be in PDF format only.

Sums shall be expressed in both words and figures in the space indicated on the bid form. Where there is a discrepancy between the bid sum expressed in words and the bid sum expressed in figures, the words shall control. Note: The online form will automatically match the word value to the numeric figure entered in whole dollar amounts with no punctuation.

Each bid must be submitted on the prescribed form. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures. Each bid must be submitted electronically online at www.Projectdog.com no later than the date and time specified bearing the name of the Bidder, his address, the name of the project for which the bid is submitted, and containing the bid security as specified in paragraph 5 below.

Enclosed with the bid shall be:

- Bid Security (5%) and Affidavit
- Completed and signed Bid Proposal and Project Reference List (Section 00301)
- Completed Certificate of Non-Collusion (Section 00520-8)
- Completed Certificate of Tax Compliance (Section 00520-8)
- Completed Labor Harmony and OSHA Training Requirements (00520-9)
- Completed Certificate of Vote (Corporation Only) (Section 00520-10)
- List of Proposed Sub-Contractors

All Bids shall be submitted online at http://www.Projectdog.com. No hard copy bids will be accepted. The Bidder will receive a convenience email confirmation upon clicking the submit bid or retract bid link for informational purposes only. The bidder shall be solely responsible for contacting Projectdog, Inc at 978-499-9014 (M-F, 9:00AM - 5:00PM) if the bidder does not receive a convenience email. It is the bidder's responsibility to review and confirm online that their bid has been Submitted and/or Retracted successfully and accurately.

Date and time for receipt of bids is set forth in the Invitation to Bid.

Timely submission of a bid online shall be the full responsibility of the Bidder. The server clock is the time of record.

Any bid may be withdrawn (retracted) prior to the time designated for receipt of bids upon clicking the "Retract Bid" link. The Bidder will receive a convenience email confirmation upon

clicking the Retract link for informational purposes only. The bidder shall be solely responsible for contacting Projectdog, Inc at 978-499-9014 (M-F, 9:00AM -5:00PM) if the bidder does not receive a convenience email. It is the bidder's responsibility to review and confirm online that their bid has been Submitted and/or Retracted successfully and accurately.

Withdrawn bids may be modified and submitted up to the time designated for the receipt of bids.

3. Subcontracts:

The Bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this contract must be acceptable to the Owner.

4. Telegraphic Modification: (NOT USED)

5. Qualifications of Bidders:

The Owner shall make such investigations as he deems necessary to determine the ability of the Bidder to perform the work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be accepted.

The low bidder shall be required to provide proof that his bid is based on paying workers the Massachusetts prevailing wages. Failure to provide such proof to the Owner's satisfaction may be cause for rejection of the bid.

6. Bid Security:

Each bid must be accompanied by a bid bond or cash, or a certified check on, or a treasurer's or cashier's check issued by a responsible bank or trust company, in the amount of not less than five (5) percent of the bid price, payable to the Town of North Andover. Bid bonds shall be submitted electronically via ProjectDog. Bidders submitting the 5% Bid Deposit in the form of cash, certified check, treasurer's or cashier's check issued by a responsible bank or trust company shall include the Bid Bond Affidavit form and ensure that these documents are received by the Procurement Department prior to the closing of the electronic bid.

Bid securities will be returned to all except the three lowest Bidders within five days, Saturdays, Sundays, and legal holidays excluded after the opening of bids, and the remaining checks of the Bidders will be returned promptly after the Owner and the accepted Bidder have executed the contract, or if all bids are rejected.

7. Liquidated Damages for Failure to Enter into Contract:

The successful Bidder, upon his failure or refusal to execute and deliver the contract and bonds

required within ten days after he has received notice of the acceptance of his bid, shall forfeit to the Owner, as liquidated damages for such failure or refusal, the security deposited with his bid, provided that the amount of the security which becomes the property of the Owner shall not, in any event, exceed the difference between his bid price and the bid price of the next lowest responsible Bidder.

8. Time of Completion and Liquidated Damages:

Construction shall be substantially complete within **90 calendar days** from and including issuance of a notice to proceed. Construction shall be finally complete within **150 calendar days** from and including issuance of a notice to proceed. Bidders must agree to pay liquidated damages as stated in the Agreement, in the amount of \$1,000 dollars for each day beyond the Contract Completion dates, for which Substantial Completion and Final Completion is not achieved.

9. Conditions of Work:

Each Bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful Bidder of his obligation to furnish all material and labor necessary to carry out the provisions of his contract. Insofar as possible the Contractor in carrying out his work must employ such methods or means as will not cause any interruption of or interference with the work of any other Contractor.

10. Addenda and Interpretations:

No interpretation of the meaning of the Drawings, Specifications or other pre bid documents will be made to any Bidder orally. No interpretation of the meaning of the Drawings, Specifications or other pre-bid documents will be made to any Bidder orally.

Every request for such interpretation should be in writing addressed to Jamie Veillette, PE at the email address <u>Jamie.veillette@apexcos.com</u> and to be given consideration must be received by 12:00 p.m. at least seven (7) calendar days prior to the date fixed for the opening of bids.

Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the Specifications, not later than three (3) days prior to the date fixed for the opening of bids. All addenda must be acquired electronically at www.Projectdog.com. Each individual or firm recorded as having requested a set of Contract Documents will be electronically notified via email when addenda are issued. Failure of any Bidder to receive any such addendum or interpretation shall not relieve any Bidder from any obligation under their bid as submitted. All addenda so issued shall become part of the Contract Documents.

11. Security for Faithful Performance:

Simultaneously with his delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the Owner and shall be in the full amount of the accepted proposal.

12. Power of Attorney:

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

13. Notice of Special Conditions:

Attention is particularly called to those parts of the Contract Documents which deal with the following:

- a. Inspection and Testing of Materials;
- b. Dewatering and Portable Dams;
- c. Grading;
- d. Insurance Requirements;
- e. Wage Rates;
- f. Coordination of the Work;
- g. Health and Safety;
- h. Underground Utilities;
- i. Permit compliance;
- j. Guarantee; and
- k. Subsurface Conditions.

14. Laws and Regulations:

The Bidder's attention is directed to the fact that all applicable State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the contract the same as though herein written out in full.

15. Site Examination:

The Bidder is expected to examine the site, stockpiles, borrow source, material test results, and the subsurface information, and then, based upon his own inspections, interpretations, and such other investigations, as he may desire, decide for himself the character of material to be encountered and excavated, the suitability of the materials to be used for backfilling and other purposes, groundwater conditions, difficulties or obstacles likely to be encountered, and other conditions affecting the work.

The Bidder is expected to be familiar with all sites for completion of the project. Failure to visit the sites will not be a means for additional compensation. Contact the Department of Public Works to arrange visits to each site. Three days minimum notice shall be required for all requests.

16. Obligation of Bidder:

At the time of the opening of bids, each Bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Contract Documents (including all addenda). The failure or omission of any Bidder to examine any form, instrument, or documents shall in no way relieve any Bidder from any obligation in respect to his bid.

17. Minimum Wage Rates:

State wage rates apply to this project. The Wage Determination is attached to these Specifications. It is the responsibility of the Contractor, after award, to request, if necessary, any additional information on wage rates for those tradespeople who are not covered by the applicable Wage Decision, but who may be employed for the proposed work under this contract.

The Contractor shall submit certified payroll records to the Department of Labor and Industries and the Owner on a weekly basis. Failure to submit records will be cause for the withholding of payment due the Contractor.

18. Manufacturer's Experience:

Whenever it is written that an equipment manufacturer must have a specified period of experience with his product, equipment which does not meet the specified experience period can be considered if the equipment supplier or manufacturer is willing to provide an "Efficiency Guarantee Bond" or cash deposit for the duration of the specified time period which will guarantee replacement of that equipment in the event of failure.

19. Equal Products Acceptable:

Wherever in the Drawings and Specifications any item of equipment or material is designated by reference to a particular brand, manufacturer, or trade name, it is understood that an approved equal product, acceptable to the Engineer may be substituted by the Bidder or Contractor. It shall be the Contractor's responsibility to coordinate all submittals to eliminate any conflicts which might arise due to the use of the "or equal" item. Any additional costs incident to the use of "or equal" items, including re-design, will be paid by the Contractor.

20. Sales Tax Exemption:

Materials and equipment purchased for permanent installation in this project will be exempt from the Massachusetts Sales and Use Tax. The exemption certificate number will be furnished to the Contractor. Each bidder shall take exemption into account in calculating his/her bid for the work.

21. Guarantee:

The Contractor guarantees the work performed under this contract and all materials furnished by him for use in connection therewith to be free from defects or flaws for one (1) year after the completion of the Contract, and guarantees for a term of one (1) year from the date of final completion of the work to maintain the stability of all materials, equipment, and workmanship, except that due to normal wear and tear, at his own expense when notified in writing to do so by the Engineer and such work shall be performed to the satisfaction of the Engineer.

If, at any time within said guaranty period, any part of the work constructed under the terms of this contract shall, in the opinion of the Engineer, require repair or replacement due to defective work or materials furnished by the Contractor, he may notify the Contractor in writing to make the required work and repairs, and the Contractor shall perform the same promptly. If he shall not do so, the Owner may do it and charge the Contractor.

It is expressly understood, however, that these guarantee provisions shall not absolve the Contractor from any liability to the Owner arising out of a failure to substantially complete the work in accordance with the Drawings and Specifications.

22. Bonding and Insurance:

The Contractor must furnish Payment Bonds, each of which shall be in an amount not less than fifty (50) percent of the contract price. Contractors should obtain such construction insurance (e.g., Fire and Extended Coverage, Workmen's Compensation, Public Liability and Property Damage, and "All Risk" Builder's Risk) as indicated in the Supplemental Conditions (Section 00800).

23. Health and Safety Regulations:

This project is subject to all the Health and Safety Regulations (CFR 29 Part 1926 and all subsequent amendments) as promulgated by the U.S. Department of Labor on June 24, 1974. Contractors are urged to become familiar with the requirements of these regulations, as well as the Occupational Safety and Health Administration's (OSHA) 29 CFR 1910.120.

24. Access to the Project:

The successful BIDDER shall provide full and complete access to the project site or any portion thereof by any authorized agent of the North Andover Department of Public Works at any time during normal working hours throughout the duration of the Contract.

26. Traffic Police:

Traffic control, when required by the Chief of Police or the Owner, will be paid for by the Contractor under the appropriate Bid item. The Contractor is required to directly coordinate all Police details with the North Andover Police Department. Any police overtime expenses incurred by the Town due to the Contractor electing to work longer than the normal workday (eight consecutive hours, weekends, or holidays) shall be the responsibility of the Contractor, the cost of which will be deducted from the monthly pay requisition. The Contractor will also be charged for any police expenses when police coverage is requested or scheduled in advance by the Contractor, but the Contractor does not work.

27. Third Party Work:

The Contractor is responsible for maintaining a safe and secure worksite at all times, and for expeditiously repairing any damage done to private property. If, in the opinion of the Owner, the Contractor is negligent in these duties the Owner shall have the right to employ a third party to remedy the problem.

Situations which develop and require the services of and payment to a third party will be handled in the following manner:

The Contractor will be given a reasonable period of time determined at the discretion of the Owner to remedy the situation without third party involvement. If the Contractor is unavailable the Owner will authorize work by a third party on the Contractor's behalf.

Third party work authorized on the Contractor's behalf by the Owner shall be paid for by the Contractor within a reasonable time period (generally two weeks). If payment is not made within a reasonable time period the Owner will make payment and deduct the cost from the next pay requisition.

In the case of inadequately secured worksites necessitating extra or increase police details or other public safety personnel, the following procedure will be followed. The Contractor (if available) will be notified that the worksite needs to be secured in order to prevent the need for weekend/night police coverage. If the area is not immediately secured as determined by the Owner or Engineer, a police, fire, or highway department detail will be used and the Contractor will be charged for the cost. It is understood that in many instances worksites cannot realistically be secured to a point where police or other safety personnel are not needed. In these instances, the Owner will continue to pay for the coverage.

END OF SECTION 00100

Projectdog, Inc

Supplemental Instructions to Bidders for Electronic Bid Projects (E-Bid)

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Dago

Sign Up

Every user of <u>Projectdog.com</u> has a unique username and password for their account. <u>MANDATORY</u>: All users must keep usernames and passwords PRIVATE and SECURE. Do not share accounts.

- 1. Go to <u>www.Projectdog.com</u>.
- 2. Select the "Sign Up" (Fig 1).
- 3. Complete all required form fields and press Submit. An automatic email will be sent to the registered email.
- 4. Select the confirmation link in the email to complete the registration.

Login

- 1. Go to <u>www.Projectdog.com</u>.
- 2. Enter a registered email address and password (Fig 1).
- 3. Press Login.

Logoff

- 1. Hover over Home (Fig 2).
- 2. Select "Logoff".

Forgotten Password

- 1. Select "Forgot your password?" (Fig 3).
- 2. Enter the e-mail address.
- 3. Select "Send Info". An automated e-mail will be sent with the password.

Account Information

View and edit user contact information. To change an email address, users must register a new account. Call Projectdog to have the old account removed.

- 1. Hover over Home (Fig 4).
- 2. Click "My Information".
- 3. Edit information as needed.
- 4. Click "Save" to finalize edits.









Project Details

Utilize the search page (Fig 5) or enter a Project Code (Fig 6) to view a project's "Project Details" page (Fig 7).

Search Project Calendar			, -	
Search ALL Projects				0 Pack/Balance
Refine Search:				
City :	State:	All 🔹		
Project Details Key Word :				
Limit search by date.			75	
(Company)	1	particular and a second se		
From :	3/28/2016 To:			
From : USA	13/28/2016 To:			
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Acquire Documents

Download all project documents.

- 1. Click "Acquire Documents" link found on a project's "Project Details" page (Fig 7).
- 2. Respond to the Legal Notice after reviewing.
- 3. Click on any file description to open, review, or save a document (Fig 8).

Users are automatically added to the project's "Document Recipients" list to receive update notifications upon viewing any document online.

Document Recipients

Review all plan holders who have acquired documents.

- 1. Click "Document Recipients" link found on a project's "Project Details" page (Fig 7).
- 2. All potential bidders are listed and sorted by company type (Fig 9). Click on a column title to sort alphabetically.







Electronic Bid (E-Bid)

This project is being **Electronically Bid** at <u>www.Projectdog.com</u>. Hard copy bids <u>will not</u> be accepted by the Awarding Authority. Go to <u>www.Projectdog.com</u> and Login with an existing account or click <u>Sign Up</u> to register for free. Enter a project code or search by keyword to access the "Project Details" page. Select "Acquire Documents" to download all bidding documents.

A				Enter Project Code GO
(F)	Home	Project Central	Company	
	Loc optimite			
				Add to my Project Calend
Code: 799090 Project Title: Ebid Location: Newburyport, M	A	Project	Details	0 - 5
Timeline		2/12 10 00 11		i i i i i i i i i i i i i i i i i i i
General Bid Deadline:	13010: 05/2 06/2	1/13 04:00 PM		
Sub Bid Deadline:	06/1	9/13 04:00 PM		
Estimated Cost:	Nego	otiated		
Project Owner		24.04724.02		
Sales Department				Phone: 978-499-9014
18 Graf Road				Fax: 978-499-9014
Suite 8 Newburyport MA US, 019	950			Email: sales@projectdog.com
Document Manager				
Online Orders				Phone: 978-499-9014
Projectdog 18 Graf Road, Suite 8				Fax: 978-499-9016
Newburyport MA US, 019	50			Email: orders@projectdog.com
Contract Information				
Project: Ebid Test Demo for Sales	Departmen	vt.		
Additional Information: THIS PROJECT IS BEING E prepared and submitted documents are available	LECTRONIC at www.Pro	CALLY BID AND HARD (ojectdog.com - Tutoria g with all project doci	COPY BIDS WILL Is and instruction mentation.	NOT BE ACCEPTED. The bids are to be as on how to complete the electronic bid
Project Documents				
Acquire Documents				
Document Recipients				
GC E-Bid				
Sub E Bid				
C				
•				

Section#	Description	Status	Bidding	
220000	Plumbing	Incomplete	GO	
230000	HVAC	Incomplete	GO	
260000	Electrical	Incomplete	GO	

How to Submit an E-Bid

Complete and save all required forms as PDF files. Please be sure to sign all required signatures either digitally or manually.

1. Select the **GC E-Bid** or **Sub E-Bid** link located on the "Project Details" page.

Subcontractors select a bidding trade;

General Contractors will not be able to submit an E-Bid until the official sub bid tabulation is released by the Awarding Authority.

- 2. Answer / enter / upload all required areas. Enter all dollar value amounts as a <u>whole</u> <u>dollar values only</u>.
- 3. Select "Submit My E-Bid." Review the submitted bid package via the "View My Bid Package" link.

It's that simple!



Cancel Save Reset	ectdog.com/?Description=01 General Bid 01 General Bid Form Up 01 General Bid Form File:	I Form&ProjectID=797441&UserI		- Cli Fil a c "Sa	Add File ck "Browse" or "Choose e" to attach a PDF file from omputer. To upload, click ave" on the left-hand side.
You will not be sufficient time to u	able to Submit your bid unless all mar pload all information. You will receive a for your re DHCD 016128 Roof Replacement & Warning: Your Bid Please complete: Acknowledge Addendum 0,1, Bid Price (Whole Dollar) Invalid, nu Bid Bond Bidders Reference Form Please complete all mandatory a	ndatory fields are complete. Plea an automated email once comple cords. Vinyl Siding, Project #811541 is not complete. Imeric values only.	ase allow yoursel ated. Please sav	f e this	- Warning E-Bids cannot be submitted unless all areas are complete.
	Acknowledge Addendum 0,1,	🔍 Yes 🔍 No			Save before adding files or
	Bid Price (Whole Dollar)	.00			data may need to be re-entered
	Form for General Bid (Signature pa Bid Bond Bidders Reference Form Item 2 Sub-bids There are no Sub bid Bid Close D Days 2 Hours 20 Mit	age) Replace File - View File Add File - Add File - s as follows: s for this project. es in: putes 20 Seconds.			Projectdog.com server time is set to industry standards at time-a.nist.gov. Bidders are encouraged to update their computer clock.
	Save <u>Submit my E</u>	-Bid Close			

Bidders may save, submit or modify an Electronic Bid (E-Bid) at any time prior to bid close. Once submitted, a bid cannot be edited. To modify a bid the bidder must retract the bid, make any necessary changes, and then submit the bid again. Upon submitting or retracting the bidder will receive a convenience email for informational purposes only. Bidders are encouraged to contact Projectdog if an email is not received.

It is the bidder's responsibility to review and confirm online that a bid has been submitted and/or retracted and that the bid is 100% true, complete and accurate. All bidders are required to review their submitted E-Bid via the "<u>View My Bid Package</u>" link.

If a bid is submitted prior to an addendum being issued the bidder will receive an automated email for informational purposes only stating the bidder must review the addendum, retract the bid, acknowledge all addenda, and submit the bid again. If a bidder fails to acknowledge addenda their bid may be rejected by the Awarding Authority.

Once the bid deadline has closed the E-Bid links are no longer available. All E-Bids are complied in real time upon bid close and published forthwith on the "Project Details" page titled as "List of Bids Received". Official bid tabulations are posted at the discretion of the Awarding Authority.

For additional assistance, call Projectdog at (978) 499-9014 (M-F, 9AM-5PM).

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SECTION 00301

BID FORM

To the Town of North Andover, Massachusetts, acting through its Town Administrator ("the Owner"):

Regarding: North Lake Cochichewick Boat Launch

The Owner reserves the right to reject any bid in the event that any bid item or items are obviously unbalanced or appear to the Owner to be so unbalanced as to affect or to be liable to affect adversely any interest of the Owner.

The Owner reserves the right to reject any or all bids if it deems it to be in its best interest to do so.

The Owner reserves the right to award the Contract based on sufficiency of appropriated funds to complete the work.

The Undersigned, as Bidder, declares as follows:

- The only parties interested in this BID as Principals are named herein;
- This BID is made without collusion with any other person, firm, or corporation;
- No officer, agent, or employee of the Owner is directly or indirectly interested in this BID;
- The Bidder has carefully examined the site of the proposed Work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed Work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this BID, and has carefully read and examined the Drawings, the annexed proposed AGREEMENT and the Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof;
- Bidder understands that information relative to subsurface and other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) has been furnished only for his information and convenience without any warranty or guarantee, express or implied, that the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered will be the same as those shown on the Drawings or in any of the other Contract Documents and agrees that the Bidder shall not use or be entitled to use any such information made available to him through the Contract Documents or otherwise obtained by him in his own examination of the site, as a basis of or ground for any claim against the Owner or the Engineer arising from or by reason of any variance which may exist between the aforesaid

information made available to or acquired by him and the subsurface and/or other conditions, natural phenomena, existing pipes and/or other structures (surface and/or subsurface) actually encountered during the construction work, and has made due allowance therefore in this BID;

- Bidder understands that the quantities of work tabulated in this BID or indicated on the Drawings or in the Specifications or other Contract Documents are approximate and are subject to increase or decrease as deemed necessary by the Engineer; and
- Bidder agrees that, if this BID is accepted, Bidder will contract with the Owner using substantially the same form as the contract for the Town of North Andover provided herein, which incorporates all Contract Documents deposited in the office of the Engineer, this BID Form being part of said Contract Documents, and that the Bidder will perform all the work and furnish all the materials and equipment, and provide all labor, services, plant, machinery, apparatus, appliances, tools, supplies and all other things required by the Contract Documents in the manner and within the time therein prescribed and according to the requirements of the Engineer as therein set forth, and that the Bidder will take in full payment therefore the lump sum or unit price applicable to each item of the Work as stated in the following schedule:

Bidders must bid on each item of the Base Bid. All entries in the entire BID must be made clearly and in ink; bid prices must be written in both words and figures. In case of discrepancy, the written word shall govern.

Bidders shall insert extended item prices obtained from quantities and unit prices. In case of discrepancy between the products obtained by multiplying the estimated quantity by the unit price, the actual product shall apply. In case of discrepancy between the sum of the total figure of the items and the total amount listed, the actual sum shall apply.

Refer to Section 01024 - Measurement and Payment for Item Descriptions.

Addenda: This BID includes Addenda numbered _____ to ____ (To be filled in by Bidder if Addenda are issued.)

(Bidder)	 	 	 _
(by)	 	 	 -
(Title)	 	 	

PART I – BASE BID (ITEMS 1- 27)

Item No.	Item Description and Unit Price in Words	Units	Estimated Quantity	Unit Price (In Figures)	Extended Amount (In Figures)
1	Mobilization and Demobilization (inc. bonds and insurance)	LS	1		
2	Turbidity Curtain, Portable Dam, Dewatering, and Treatment	LS	1		
3	Mechanically Stabilized Earth (MSE) Block Retaining Wall	SF	850		
4	Permeable Paver Boat Launch	LS	1		
5	Rip Rap Bank Stabilization	LS	1		
6	Site Clearing, Grubbing, and Tree Removal	LS	1		
7	Site Grading	LS	1		

N. Lake Cochichewick Boat Launch North Andover, MA

Item No.	Item Description and Unit Price in Words	Units	Estimated Quantity	Unit Price (In Figures)	Extended Amount (In Figures)
8a	Permeable Concrete Pavers (Stone Filled)	SY	850		
8b	Permeable Concrete Pavers (Loam and Seed Filled)	SY	300		
9	12" RCP Drain Pipe	LF	50		
10a	12" Drain Flared End Section	EA	1		
10b	2-ft Dia. Drain Structure	EA	1		
11a	Additional Crushed Stone	СҮ	5		
11b	Rip-Rap (Infiltration Basins and Misc. Areas)	СҮ	15		

Item No.	Item Description and Unit Price in Words	Units	Estimated Quantity	Unit Price (In Figures)	Extended Amount (In Figures)
12	Additional Excavation of Unsuitable Materials	CY	50		
13	Electrical Handholes	EA	2		
14	4" PVC Electrical Conduit (2-each)	LF	240		
15	3.5" Miscellaneous Pavement (Driveway)	SY	55		
16 a	Loam and Seed (Infiltration Basins)	SY	260		
16b	Loam and Seed (All Other Areas)	SY	1,260		
17	Trees	EA	17		

Item No.	Item Description and Unit Price in Words	Units	Estimated Quantity	Unit Price (In Figures)	Extended Amount (In Figures)
18 a	36" Wooden Post Rope Fence	LF	220		
18b	42" Safety Railing	LF	125		
19	New Guardrail	LF	205		
20	Site Accessories (Bollards, Gates, Signs, Boulders, Boat Racks)	LS	1		
21	Filter Sock	LF	1,000		
22	Silt Fence	LF	700		
23	Silt Sacks	EA	2		

Item No.	Item Description and Unit Price in Words	Units	Estimated Quantity	Unit Price (In Figures)	Extended Amount (In Figures)
24	Rock Excavation	СҮ	10		
25	Allowance for Material and Soil Testing <u>Twenty Thousand Dollars and Zero Cents</u>	LS	1	\$20,000.00	\$20,000.00
26a	Sediment Disposal – Contaminated and Impacted Soils	TONS	90		
26b	Sediment Disposal – Unimpacted and Uncontaminated Soils	TONS	30		
27	Miscellaneous Work	LS	1		

TOTAL FOR BASE BID (ITEMS 1- 27)

Total Amount of Base Bid.

\$

(Amount in figures)

(Amount in words)

Basis of Award: The basis of award shall be at the Owner's sole discretion, contingent on the Base Bid Price first and Bid Alternatives will be added in sequential order. The grand total of the Base Bid, will be used to determine the lowest responsive bidder, unless the Town elects to add the Bid Alternatives. Each Bid Alternative will be added to the Basis of Award in sequential order starting with Bid Alternative A. Contract to be awarded to the lowest responsible and eligible bidder in compliance with Sections 39M inclusive of Chapter 30 of the General Laws of the Commonwealth of Massachusetts.

<u>Requirements</u>: Specific items of this Contract may be eliminated or reduced in quantity to keep within limits of available funding, at the OWNER'S option. All of the above items shall include all labor, materials, equipment, hauling, disposal, transportation, overhead, profit and insurance to cover the work as required in the Contract Documents.

The undersigned agrees that extra work, if any, will be performed in accordance with Article 11 of the General Conditions of the Contract and will be paid for in accordance with Article 13 of the General Conditions of the Contract.

An unbalanced or unreasonable lump sum and/or unit price submitted herein may be considered as non-responsive to the Instructions to Bidders.

The bid security accompanying this BID shall be in the amount of five percent (5%) of the BID.

The Bidder, by submittal of this BID, agrees with the Owner that the amount of the bid security deposited with this BID fairly and reasonably represents the amount of damages the Owner will suffer due to the failure of the Bidder to fulfill his agreements as above provided.

As provided in the INSTRUCTIONS TO BIDDERS, the Bidder hereby agrees that he will not withdraw this BID within ninety (90) consecutive calendar days after the actual date of the opening of Bids and that, if the Owner shall accept this BID, the Bidder will duly execute and acknowledge the AGREEMENT and furnish, duly executed and acknowledged, the required CONTRACT BONDS within ten (10) days after notification that the AGREEMENT and other Contract Documents are ready for signature.

Construction shall be substantially complete within **90 calendar days** from and including issuance of a notice to proceed. Construction shall be finally complete within **150 calendar days** from and including issuance of a notice to proceed. Liquidated damages for each calendar day of delay shall be \$1,000 as stipulated in the AGREEMENT.

Should the Bidder fail to fulfill any of his agreements as herein above set forth, the Owner shall have the right to retain as liquidated damages the amount of the bid check or cash which shall become the Owner's property. If a bid bond was given, it is agreed that the amount thereof shall be paid as liquidated damages to the Owner by the Surety.

The undersigned as Bidder, hereby certifies that he is aware of the applicable requirements of the Williams-Steiger Occupational Safety and Health Act of 1970. (O.S.H.A.), and all latest revisions thereto, and that this Proposal is prepared on the basis of compliance with those requirements.

The undersigned as Bidder, hereby certifies that he will maintain records in reasonable detail, which accurately and fairly reflect the financial transactions and disposition of the Bidder, in accordance with M.G.L. Chapter 30, Section 30R.

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that he will comply fully with all laws and regulations applicable to awards made subject to MGL Ch. 30, Section 39M. The bidding and award of the contract will be in full compliance with Section 39M inclusive of Chapter 30 of the General Laws of the Commonwealth of Massachusetts as last revised.

The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

Pursuant to G.L. c.62C, §49A, the undersigned bidder certifies under penalties of perjury that the he/she/it has complied with all laws of the commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting child support.

The undersigned certifies under penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this paragraph the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

The following documents are attached to and made a condition of the bid, and shall be filed with the bid:

- Bid Security (5%) and Affidavit
- Completed and signed Bid Proposal and Project Reference List (Section 00301)
- Completed Certificate of Non-Collusion (Section 00520-8)
- Completed Certificate of Tax Compliance (Section 00520-8)
- Completed Labor Harmony and OSHA Training Requirements (00520-9)
- Completed Certificate of Vote (Corporation Only) (Section 00520-10)
- List of Proposed Sub-Contractors

This Proposal must bear the written signature of the Bidder or that of his duly authorized agent. If the Bidder is a corporation or a partnership, the bid must be signed by a duly authorized officer of such corporation or by a Partner and the title of such officer must be stated. Satisfactory completion of the following data is an essential part of submission of this Proposal and is required. Bid must be embossed with corporate seal.

(Name of General Bidder)	
Date uthorized representative)	9
	SEAL
(Business address)	
(City, State, Zip)	
	(Name of General Bidder) Date uthorized representative) (Business address) (City, State, Zip)

The Bidder is requested to list five (5) or more of your firm's projects in the past 10 years in the Commonwealth of Massachusetts of a similar character as required for acceptable bid. References will enable the Owner to judge the Contractor's qualifications, experience, skill, and business standing.

Project Name:					
Project Location:					
Contract Amount: \$	Completion Date				
Owner:					
Contact Name:	_Telephone:				
Architect/Engineer:					
Contact Name:	_Telephone:				
Project Name:					
Project Location:					
Contract Amount: \$	Completion Date				
Owner:					
Contact Name:	_Telephone:				
Architect/Engineer:					
Contact Name:	_Telephone:				

Project Name:					
Project Location:					
Contract Amount: \$	Completion Date				
Owner:					
Contact Name:	Telephone:				
Architect/Engineer:					
Contact Name:	Telephone:				
Project Name:					
Project Location:					
Contract Amount: \$	Completion Date				
Owner:					
Contact Name:	Telephone:				
Architect/Engineer:					
Contact Name:	Telephone:				
Project Name:					
Project Location:					
Contract Amount: \$	Completion Date				
Owner:					
Contact Name:	Telephone:				
Architect/Engineer:					
Contact Name:	Telephone:				
[ADD SUPPLEMENTARY PAGES AS NECESSARY]

END OF SECTION 00301

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BID DEPOSIT AFFIDAVIT

This document is an affidavit form that is drafted to serve as a statement wherein the person (Bidder) who signs it swears under penalty of perjury that the facts and information that are identified in this affidavit are true.

In lieu of an insurance Bid Bond certificate, a hard copy of this completed Bid Deposit Affidavit AND the 5% Bid Deposit in the form of cash, certified check, treasurer's or cashier's check issued by a responsible bank or trust company MUST be received by the Awarding Authority PRIOR to the closing of the project's electronic bid.

BOTH the completed Bid Deposit Affidavit and the check (or cash) shall be enclosed in a sealed envelope with the following information plainly written on the outside:

DO NOT OPEN BEFORE: [indicate DATE and TIME of the bid opening] Project Name -Project Number -Bidder's Name -Business Address -Phone Number -

It is the Bidder's responsibility to ensure that this completed Bid Deposit Affidavit AND the check (or cash) are submitted as stated above AND received by the Awarding Authority prior to the closing of electronic bids. In addition, this completed Bid Deposit Affidavit must be uploaded with the electronic bid via the project's E-Bid <u>Add File</u> link "Bid Deposit (Bid Bond or Affidavit)" at <u>www.Projectdog.com</u>.

The Bidder understands and consents that any failure to do so whether his own or other fault may result in the rejection of said bid. The Bidder is solely responsible for the accuracy and value of the Bid Deposit. If the Bid Deposit is less than the required amount as outlined in the project specifications the bid may be rejected.

Bid Deposit amount enclosed:	Certified check, Treasurer's or Cashier's check
	Cash
Date:	
Bidder's Name:	
Address:	
City, State, Zip:	
Signature:	

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SECTION 00520

CONSTRUCTION CONTRACT

CONTRACT NO. ______

PUBLIC WORKS CONSTRUCTION CONTRACT WITH THE TOWN OF NORTH ANDOVER SAMPLE CONTRACT

THIS CONTRACT made and entered into this ____ day of _____, 20___, by and between _____, a domestic profit corporation duly authorized by law and having a principal place of business at ______, hereinafter called "CONTRACTOR", and the TOWN of North Andover, ("TOWN") a municipal corporation duly established by law and located in Essex County and Commonwealth of Massachusetts, acting by and through its Commissioner of Public Works.

WHEREAS, the TOWN issued its Invitation for Bids for _____; and

WHEREAS, the CONTRACTOR represents that it is duly qualified in this field, and has agreed to perform such services for the TOWN; and

WHEREAS, the TOWN has accepted the CONTRACTOR'S offer.

NOW, THEREFORE, IT IS AGREED by and between the Parties as follows:

-1-

The CONTRACTOR agrees that it will furnish all equipment, labor, plant, materials, and components, installing all systems and appurtenances, and performing all work shown on the Drawings and described in the Specifications of the <u>North Lake Cochichewick Boat Launch</u> project, as directed by the Town, during the period commencing upon execution and terminating______, and will perform such work in a good workmanlike manner. As per the terms of the Invitation for Bids, the work must be **substantially complete within 90 calendar days** from and including issuance of a notice to proceed. Construction shall be **finally complete within 150 calendar days** from and including issuance of a notice to proceed. Time is of the essence for this Contract. Any extensions of time must be in writing and are at the sole discretion of the TOWN.

-2-

The Invitation for Bid, the Specifications, the Bid, all required Certifications, all Insurance Binders, and the Schedule of Minimum Wage Rates, as established by the Director of the Department of

Labor Standards in the Executive Office of Labor and Workforce Development, are incorporated herein and made a part of this CONTRACT.

-3-

Total payments under this CONTRACT shall not exceed \$______. This Contract is expressly subject to and contingent upon an appropriation of funds.

-4-

The TOWN agrees to use best efforts to pay for services within thirty (30) days of receiving an invoice, so long as all services provided are sufficiently detailed in the invoice, and that the invoice has filed with the contracting department. Any payment under this Contract shall not constitute or be deemed a waiver, relinquishment, release, or abandonment of any claim which the TOWN may have against the CONTRACTOR for breach of this Contract.

-5-

The CONTRACTOR agrees that no obligation shall be considered to have incurred under this CONTRACT unless and until a purchase order shall have been duly issued and approved.

And further, that the obligation incurred shall be limited to the amount set forth in purchase order or purchase orders duly issued and approved.

-6-

The work to be done under this CONTRACT, including all the necessary labor, equipment, tools, appliances and materials in connection therewith must, in all respects, notwithstanding any provision herein to the contrary or inconsistent therewith, meet with the approval of the said Facilities Director. The CONTRACTOR states that it is qualified, and is in all relevant aspects, in good standing. The CONTRACTOR certifies that performance under this Contract will meet ethical business standards and good stewardship of taxpayer and public funding to prevent waste or abuse.

-7-

No laborer, workman or mechanic, working within the Commonwealth, in the employ of the CONTRACTOR, or any subcontractor authorized under this CONTRACT shall, in connection with the work to be done under this CONTRACT, be required or requested to work more than eight (8) hours in any one (1) calendar day, or more than forty-eight (48) hours in any one (1) week, except in cases of extraordinary emergency, unless otherwise provided by law.

-8-

The CONTRACTOR shall at all times during the Contract maintain in full force and effect Employer's Liability, Worker's Compensation (MGL c.152), Public Liability, and Property Damage

Insurance, including contractual liability coverage. All insurance shall be for policy limits acceptable to the TOWN; all required insurance shall be certified by a duly authorized representative of the insurers on the "MIIA" or "ACORD" Certificate of Insurance form (incorporated into and made a part of this agreement); and before commencement of work hereunder the CONTRACTOR agrees to furnish the TOWN with certificate(s) of insurance or other evidence satisfactory to the TOWN. The certificates shall contain the following express obligations: "In the event of cancellation or material change in a policy affecting the certificate holder, thirty (30) days prior written notice will be given the certificate holder. Where notice is not provided by CONTRACTOR's insurer, the notice will be provided by the CONTRACTOR." The TOWN shall be named as an additional insured under each policy or policies, except Workers' Compensation.

Refer to the General Conditions and Supplemental Conditions for insurance requirement limits.

-9-

It is further agreed by the CONTRACTOR that, in the event the TOWN is sued in a court of law or equity, or demand is made upon the TOWN for payment of any damages arising out of the CONTRACTOR'S performance or non-performance of this Contract, then the CONTRACTOR, without reservation, shall indemnify and hold harmless the TOWN against any and all claims arising out of the CONTRACTOR'S performance or non-performance of the CONTRACT.

To the full extent permitted by law, no official, employee, agent or representative of the TOWN of North Andover shall be individually or personally liable on any obligation of the TOWN under this Contract.

-10-

The CONTRACTOR agrees that the cost of Liquidated Damages shall be a fixed amount of **ONE THOUSAND and 00/100 DOLLARS (\$1,000.00)** for each consecutive calendar day the CONTRACTOR is in default of the Time for Completion condition for this contract.

-11-

This Contract is subject to all laws of the Commonwealth of Massachusetts, federal, state and local, which are applicable to this Contract or work with a public entity; and it is presumed that the CONTRACTOR is cognizant thereof. Any and all proceedings or actions relating to the subject matter herein shall be brought and maintained in the courts of the Commonwealth, which shall have exclusive jurisdiction thereof. This paragraph shall not be construed to limit any other legal rights of the parties.

The CONTRACTOR agrees to comply with all the provisions of General Laws, Chapter 30, Sections 39M and 39N, and Chapter 149, Sections 26 and 27, and all related sections, including amendments thereto, in performing all work under this CONTRACT, and the provisions of said sections are made a part of this CONTRACT and are to be considered as covenants, terms and conditions hereof as though all the provisions were specifically incorporated herein, and the provisions of the said sections shall apply even though it may appear they are not applicable to the work of the type to be performed under this CONTRACT. The said CONTRACTOR agrees to pay the Wage Scale, as established by the Director of the Department of Labor Standards in the Executive Office of Labor and Workforce Development, a copy of which was provided with the Invitation for Bids and the CONTRACTOR further agrees that, in the event that there are to be employees of classifications other than those specifically stated herein engaged in the work to be performed under this CONTRACT, to submit a list of the additional classifications of those to be employed to the said Facilities Director, and the said CONTRACTOR agrees that it will pay the Schedule of Wages, as determined by the said Director of the Department of Labor Standards in the Executive Office of Labor and Workforce Development, under the provisions of General Laws, Chapter 149, Section 27, and the amendments thereto.

-13-

The CONTRACTOR will carry out the obligations of this Contract in full compliance with all of the requirements imposed by or pursuant to General Laws c.151, §1, et seq. (Minimum Wage Law) and any executive orders, rules, regulations, and requirements of the Commonwealth of Massachusetts as they may from time to time be amended. The CONTRACTOR will at all times comply with the wage rates as determined by the Commissioner of the Department of Labor and Industries, under the provisions of General Laws c.149, §§26 to 27D (Prevailing Wage Law), as shall be in force and as amended. The CONTRACTOR will, in addition to any other submissions required by the Prevailing Wage Law, submit certified weekly payrolls to the TOWN with the information described in General Laws c.149, §27B.

-14-

The CONTRACTOR will carry out the obligations of this Contract in full compliance with all of the requirements imposed by or pursuant to General Laws c.151B (Law Against Discrimination) and any executive orders, rules, regulations, and requirements of the Commonwealth of Massachusetts as they may from time to time be amended.

The CONTRACTOR shall comply with all federal and state laws, rules and regulations promoting fair employment practices or prohibiting employment discrimination and unfair labor practices and shall not discriminate in the hiring of any applicant for employment nor shall any qualified employee be demoted, discharged or otherwise subject to discrimination in the tenure, position, promotional opportunities, wages, benefits or terms and conditions of their employment because of race, color, national origin, ancestry, age, sex, religion, disability, handicap, sexual orientation or for exercising any rights afforded by law.

The CONTRACTOR shall give its personal attention constantly to the faithful performance of the work and shall not assign or delegate, in whole or in part or otherwise transfer any liability, responsibility, obligation, duty or interest under this Contract without the written approval of the TOWN.

Any subcontract entered into by the CONTRACTOR for the purposes of fulfilling the obligations under this Contract must be in writing, authorized in advance by the TOWN and shall be consistent with and subject to the provisions of this Contract. Subcontracts will not relieve or discharge the CONTRACTOR from any duty, obligation, responsibility or liability arising under this Contract. The TOWN is entitled to copies of all subcontracts and shall not be bound by any provisions contained in a subcontract to which it is not a party.

-16-

This Contract shall not be in force until the CONTRACTOR has executed and delivered to the TOWN and until the TOWN has accepted a Payment Bond in the amount of fifty (50%) percent of the contract price. The Payment Bond shall be secured by and paid for by the CONTRACTOR and shall be issued by a Surety Company satisfactory to the Commissioner of Public Works. Any filed or non-filed subcontractor is also required to post a payment bond based on fifty (50%) percent of their filed or non-filed sub-bid.

-17-

It is further agreed that the TOWN may terminate this CONTRACT without cause, upon fourteen (14) days' written notice to the other party, sent by certified mail, to the usual place of business of the other party. The TOWN may also terminate this CONTRACT at any time for cause. To the full extent permitted by law, no official, employee, agent, or representative of the TOWN shall be individually or personally liable on any obligation of the TOWN under this contract.

-18-

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club or other organization, entity, or group of individuals.

-19-

It is understood and agreed by the TOWN and the CONTRACTOR that a Contract Performance Record Form must be completed on this contract by the Department Head or his designee who is supervising this contract, and such Contract Performance Record Form must be submitted to the TOWN Manager, TOWN Accountant, and Purchasing Agent prior to release of final payment under this contract. If requested by the CONTRACTOR a copy of the Contract Performance Record Form shall be furnished to the CONTRACTOR.

-20-

The CONTRACTOR certifies that any and all taxes and municipal fees due and owing to the TOWN of North Andover have been paid in full.

-21-

All fees for permits or licenses required for this project by the TOWN, or any other agency, shall be an expense of the CONTRACTOR and shall not be waived (I believe we do waive Town fees for Town projects).

-22-

Notwithstanding anything in the Contract documents to the contrary, any and all payments which the TOWN is required to make under this Contract shall be subject to appropriation or other availability of funds by the TOWN Accountant. The TOWN may immediately terminate or suspend this CONTRACT without liability on the part of the TOWN for damages, penalties or other charges in the event the appropriation funding this CONTRACT is terminated or reduced to an amount which will be insufficient to support anticipated future obligations under this CONTRACT.

-23-

This contract is only binding upon, and enforceable against the TOWN if: 1) the Contract is signed by the TOWN Manager or her designee; 2) and endorsed with approval of TOWN Counsel as to form.

At any time during normal business hours, and as often as the TOWN may deem it reasonably necessary, there shall be available in the office of the CONTRACTOR for the purpose of audit, examination, and/or to make excerpts or transcript all records, contracts, invoices, materials, payrolls, records of personnel, conditions of employment and other data relating to all matters covered by this Agreement.

-24-

This instrument, together with its endorsed supplements, and the other components of the contract documents, constitutes the entire contract between the parties, with no agreements other than those incorporated herein. Any Amendments to this Contract must be made in writing and executed by all signatories to the original Contract, prior to the effective date of the amendment.

-25-

Any notice permitted or required under the provisions of this Contract to be given or served by either of the parties hereto upon the other party hereto shall be in writing and signed in the name or on the behalf of the party giving or serving the same. Notice shall be deemed to have been received at the time of actual service or three (3) business days after the date of a certified or registered mailing properly addressed. Notice to the CONTRACTOR shall be deemed sufficient if sent to the address set forth in the Contract and to the TOWN of North Andover by being sent to the TOWN Manager, TOWN Hall, 120 Main Street, North Andover, Massachusetts 01845.

IN WITNESS WHEREOF, the CONTRACTORS and the said TOWN OF NORTH ANDOVER have hereto and to a duplicate and triplicate hereof, caused their corporate seals to be affixed and these presents, together with said duplicate and triplicate, to be signed in their name and behalf by their duly authorized officers the day and year first above written.

APPROVED:	CONTRACTORS				
Melissa Murphy-Rodrigues TOWN Manager, North Andover	By Fed.I.D. or Social Security No.				
APPROVED AS TO FORM:	TOWN OF NORTH ANDOVER				
Christine P. O'Connor TOWN Counsel	Department Head				
	Lyne M. Savage TOWN Accountant				

Date:

CERTIFICATIONS

CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that our bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean natural person, business, partnership, corporation, committee, union, club or other organization, entity, or group of individuals.

NEUALUE

Date_____

Print Name & Title

Company Name

CERTIFICATE OF TAX COMPLIANCE

Pursuant to Chapter 62C of the Massachusetts General Laws, Section 49A (b), I

, authorized sign	atory for
<i>Name of individual</i> do hereby certify under the pains and penalties of	<i>Name of contractor</i> of periury that said contractor has complied with
all laws of the Commonwealth of Massachusett	s, and the Town of North Andover, relating to
taxes, permit or other fees, reporting of emp	loyees and contractors, and withholding and
remitting child support.	

Signature

Date

CONSTRUCTION CONTRACT 00520-8

CERTIFICATIONS

LABOR HARMONY AND OSHA TRAINING REQUIREMENTS

The undersigned certifies under penalties of perjury that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed at the work

and

that all employees to be employed at the worksite and in the work will have completed an OSHAapproved construction safety and health course lasting at least ten (10) hours.

Signature_____

Date_____

Print Name & Title

Company Name

CERTIFICATION

CERTIFICATE OF VOTE

(NOTE: A certified vote of the corporation may be substituted for this form.)

The Ven	ndor, is: (CHECK ONE) (Name of Company/Consultant/Corporation)
 A.	a corporation formed and existing under the laws of the state of, and pursuant to the corporate by-laws,
	(Insert Name and Title of Authorized Representative)
	is authorized to execute contracts in the name of said corporation. Such execution of any contract or obligation in this corporation's name on its behalf by such duly authorized individual shall be valid and binding upon the corporation.
 В.	a limited liability company or a partnership formed and existing under the laws of the state of, and pursuant to the limited liability company agreement or partnership agreement,
	(Insert Name and Title of Authorized Representative)
	is authorized to execute contracts in the name of said company or partnership. Such execution of any contract or obligation in this company or partnership's name on its behalf by such duly authorized individual shall be valid and binding upon the company or partnership.
 C.	is a sole proprietorship owned an operated exclusively by the undersigned.
	(Insert Name and Title of Authorized Representative)
	Execution of any contract or obligation in this sole proprietorship's name by such duly authorized individual shall be valid and binding.

Signature: (Must be signed by Corporate Officer, Partner, or Sole Proprietor)

Print Name of Above

Title

Date

CONSTRUCTION CONTRACT 00520-10

PAYMENT BOND

Bond No	
KNOW ALL MEN BY THESE PRESENTS, that we	with a place of
business at	, as Principal (the
"Principal"), and	, a corporation qualified to do
business in the Commonwealth of Massachusetts	s, with a place of business at
	as Surety (the
"Surety"), are held and firmly bound unto the To	wn of North Andover, Massachusetts as Obligee (the
"Obligee"), in the sum of	lawful money of the
United States of America, to be paid to the Oblig	ee, for which payment, well and truly to be made, we bind
ourselves, our respective heirs, executors, admin	istrators, successors and assigns, jointly and severally, firmly
by these presents.	
WHEREAS, the Principal has assumed and made a	a contract with the Obligee, bearing the date of
, for the	e construction of
NOW, THE CONDITIONS of this obligation are suc	ch that if the Principal and all subcontractors under said
contract shall pay for all labor performed or furn	ished and for all materials used or employed in said contract
and in any and all duly authorized modifications,	alterations, extensions of time, changes or additions to said
contract that may hereafter be made, notice to t	he Surety of such modifications, alterations, extensions of
time, changes or additions being hereby waived,	the foregoing to include, but not be limited to, any other
purposes or items set out in, and to be subject to	o, the provisions of Massachusetts General Laws, Chapter 30,
Section 39M, and Chapter 149, Section 29, as am	nended then this obligation shall become null and void;
otherwise, it shall remain in full force and virtue.	
IN WITNESS WHEREFORE, the Principal and Suret	ty have hereto set their hands and seals this day
of	
PRINCIPAL	SURETY
[Name and Seal]	[Attorney-in-fact] [Seal]
[Title]	[Address]
Attest:	[Phone]
	Attest:
ake Cochichewick Boat Launch CONST	RUCTION CONTRACT

N. Lake Cochichewic North Andover, MA ck Boat Launcr 00520-11

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Notice of Award

Date:

Project: NORTH LAKE COCHICHEWICK BOAT LAUNCH

Contract:	E
Contracti	Engineer's Project No.: 23012245
Bidder:	I
Bidder's Address:	

You are notified that your Bid dated ______ for the above Contract has been considered. You are the Successful Bidder and are awarded a Contract for Thomas Street Flood Mitigation.

 The Contract Price of your Contract is _______

 Dollars and ______ Cents (\$______).

You must comply with the following conditions precedent within 10 days of the date you receive this Notice of Award.

- 1. Deliver to the Engineer fully executed counterparts of the Contract Documents.
- 2. Deliver with the executed Contract Documents the Contract security (Bonds) as specified in the Instructions to Bidders, General Conditions, and Supplementary Conditions.

Failure to comply with these conditions within the time specified will entitle Owner to consider you in default, annul this Notice of Award, and declare your Bid security forfeited.

Within ten days after you comply with the above conditions, Owner will return to you one fully executed counterpart of the Contract Documents.

Owner By:_____

Authorized Signature

Title

Copy to Engineer

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Notice to Proceed

Date: _____

Project: NORTH LAKE COCHICHEWICK BOAT	LAUNCH
Owner: Town of North Andover, MA	Owner's Contract No.:
Contract:	Engineer's Project No.: 23012245
Contractor:	
Contractor's Address:	

You are notified that the Contract Times under the above Contract will commence to run on _____. On or before that date, you are to start performing your obligations under the Contract Documents.

Before you may start any Work at the Site, Paragraph 2.01 of the General Conditions provides that you and Owner must each deliver to the other (with copies to Engineer and other identified additional insureds and loss payees) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

	Owner	
	Given by:	
	Authorized Signature	
	Title	
	Date	
Copy to Engineer		

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This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

APPLICATION FOR PAYMENT

Prepared By







AMERICAN SOCIETY OF CIVIL ENGINEERS



Endorsed By





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American Council of Engineering Companies 1015 15th Street N.W., Washington, DC 20005 (202) 347-7474 www.acec.org

American Society of Civil Engineers 1801 Alexander Bell Drive, Reston, VA 20191-4400 (800) 548-2723 www.asce.org

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GUIDELINES FOR THE INTENDED USE OF EJCDC C-620, APPLICATION FOR PAYMENT

1.0 PURPOSE AND INTENDED USE OF THE DOCUMENT

The Application for Payment is used to facilitate periodic progress payments to the Contractor for Work completed and for stored materials and equipment (referred to in this document as "Stored Materials").

For additional information regarding the Application for Payment, see EJCDC[®] C–700, Standard General Conditions of the Construction Contract (2018), Paragraph 15.01, and EJCDC[®] C–001, Commentary on the 2018 EJCDC Construction Documents (2018).

2.0 APPLICATION FOR PAYMENT OVERVIEW

This document was prepared in Microsoft Excel due to the number of calculations involved in the preparation of the Application for Payment. The application consists of a Summary worksheet, and 3 supporting worksheets: Lump Sum worksheet, Unit Price worksheet, and Stored Materials worksheet.

- 2.1 Summary Worksheet calculates the amount to be paid to the Contractor at the end of each Application for Payment period. This calculation imports numbers from the supporting worksheets to determine the value of the Work completed and Stored Materials, calculate retainage, and deduct amounts previously paid to determine the amount the Contractor should be paid for the current application period. Application periods are typically one month; however these periods may be extended when Contractor's efforts do not result in the billable completion of Work or storage of materials and equipment during the payment period.
- 2.2 Lump Sum Worksheet calculates the total value for completed Work for which compensation is paid on a Lump Sum basis. The schedule of values included in this worksheet reflects a breakdown of lump sum Work items to which Contractor and Engineer have agreed, pursuant to Article 2 of the General Conditions. Costs for Stored Materials associated with lump sum items are included on this worksheet to calculate the total value for completed lump sum Work and associated Stored Materials. This total is exported to the Summary worksheet. Separate totals for Work Completed and for materials currently stored are also exported to the Summary worksheet for use in calculating the amount of retainage to be held for each.
- 2.3 Unit Price Worksheet calculates the total value for completed Work for which compensation is paid on a Unit Price basis. The schedule of values included in this spreadsheet is typically a tabulation of Unit Price items from the Agreement. Costs for Stored Materials associated with unit price items are included in this worksheet to calculate the total value for completed Unit Price Work and associated Stored Materials. This total is exported to the Summary worksheet. Separate totals for Work Completed and for Materials Currently Stored are also exported to the Summary worksheet for use in calculating the amount of retainage to be held for each.

2.4 Stored Materials Worksheet — calculates the total value for materials and equipment that have been purchased and are being stored until they are incorporated into the Work. This worksheet adds materials and equipment to the worksheet as they are brought to the site and stored; such Stored Materials are then deducted from the Stored Materials worksheet total as they are incorporated into the Work, providing a running net value for the materials and equipment remaining in storage. The values of Stored Materials must be manually added to the Lump Sum or Unit Price line items. These do not automatically update when changes are made. The amount of materials remaining in storage is eligible for payment but must be tracked separately from Work completed since different retainage rates may apply to Work completed and Stored Materials.

3.0 Instructions for filling out the Payment Application form

- 3.1 Project-specific information is to be entered in the top portion (header) of the Summary worksheet. This same information will automatically be copied to the other worksheets to complete the headers on all other worksheets.
- 3.2 Outside of the header, data can be entered in non-shaded cells when the sheet is protected. Cells shaded light blue contain equations that will automatically transfer data from other cells or make calculations to complete the worksheet. Altering any of these cells can result in errors in the Application for Payment. It is recommended that the worksheets be protected at all times unless alterations are deliberately being made to the Application for Payment form other than to enter data. See Paragraph 4.0 below for information on Protection of Worksheets.
- 3.3 Enter information regarding each item in the Lump Sum and/or Unit Price worksheets. For Lump Sum projects, each item should represent an item in the schedule of values prepared by the Contractor and approved by the Engineer/Owner, breaking down the Lump Sum amount into measurable components. For Unit Price contracts, use numbers from the Agreement as the schedule of values. Specific information on the data to be entered into each column may be seen by clicking on the header description for that column. Similar comments may be seen for cells in the "Totals" row that indicates how the number is calculated and where this number is exported to another part of the spreadsheet. See the Commentary for additional information.
- 3.4 The equations in the Summary worksheet use numbers imported from both the Lump Sum and Unit Price worksheets. Projects will typically either use the Lump Sum or the Unit Price worksheet, but some projects may use both. If one of the worksheets is not used, it should be hidden and not deleted. If it is deleted, Users will need to correct the equations in the Summary worksheet by unprotecting the worksheet and editing the equations. To hide a worksheet, right click on the worksheet tab at the bottom of the worksheet and select "Hide." To unhide a worksheet, right click on any worksheet tab and select "Unhide," and then select the worksheet to unhide and click "Okay." This same process may be used to hide these Guidelines for Use.

3.5 EJCDC C-620 contains calculation functions that are provided solely for the convenience of the user. EJCDC and its Sponsoring Organizations do not warrant or guarantee the accuracy or completeness of any information generated by the calculator.

4.0 Protection of Worksheets

- 4.1 The cells in this Workbook that create the forms or contain equations have been coded to "lock" the cells that should not be altered. It is recommended that the Workbook be Protected (cells locked) at all times unless it is necessary to add or delete rows. Directions for adding and deleting rows are provided in the next section. Passwords can be used to lock the Protect / Unprotect settings on spreadsheets, however the worksheets in this workbook do not require a password.
- 4.2 To unprotect a worksheet, click on the "Review" menu tab at the top of Excel, then click "Unprotect Sheet." To protect a worksheet, click on the "Review" menu tab at the top of Excel, then click "Protect Sheet." This will open a dialog box in which the User is allowed to select protection options. It is recommended that only the top two checkboxes for "Select Locked Cells" and "Select Unlocked Cells" be checked. This will reset the protection for the Worksheet.

5.0 Adding and Deleting Rows

- 5.1 A limited number of blank rows are provided in the Lump Sum, Unit Price, and Stored Material worksheets. Additional rows may be added to these worksheets by the User. The first step in this process is to unprotect the worksheet as previously discussed. After the sheet is unprotected, move with caution to prevent inadvertently deleting any cells that contain equations. To insert a row, right click in the row heading at the left of the spreadsheet and select "Insert." A new row will be inserted at the location where the cursor was placed in the row heading. If more than one new row is desired, left click and drag the cursor to include the desired number of rows, right click in the selected row headings and then select "Insert." It is important that the line immediately above the "Totals" row not be included in the rows selected. Doing so will require that equations to include the new rows, unless the row directly above the "Totals" row is also selected.
- 5.2 After new rows are inserted, it is important to copy a line from one of the original rows so correct formatting and equations are copied into each new row. To do this, select the row to be copied by clicking the cell in Column A and dragging the cursor to the last column in the table. Then select "Copy" from the menu or type CTRL+C to copy the cells. Excel will show that this row has been copied by showing a moving dashed line around the cells that are to be copied. Then select the new rows into which the information is to be copied as before and select Paste from the menu or type CTRL+V.
- 5.3 To delete an unused row, right click in the row heading on the left of the spreadsheet for the row to be deleted and select "Delete." The selected row will be deleted. If more than one row is to be deleted, left click and drag the cursor to the desired number of rows to be deleted and then right click to open the menu and select "Delete." Unlike the admonition on adding new rows, it is okay to delete the row just above the "Totals" row.
- 5.4 After rows have been added or deleted, it is important reset the worksheet protection.

6.0 Saving Files

This file is provided as a Microsoft [®] Excel Open XML workbook template (.xltx) to prevent this file from being inadvertently changed. When an application for payment is created for a specific project it should be saved as an Excel workbook (.xlxs) file. To do this, select Save As (F12), type in a new file name and select Excel Workbook (.xlxs) from the drop down Save As Type menu.

7.0 License Agreement

This document is subject to the terms and conditions of the License Agreement, 2018 EJCDC[®] Construction Series Documents. A copy of the License Agreement was furnished at the time of purchase of this document, and is available for review at www.ejcdc.org and the websites of EJCDC's sponsoring organizations.

Contractor's Application for Payment							
Owner:	Owner's Project No.:						
Engineer:	Engineer's Project No.:						
Contractor: Contractor's Project No.:							
Project:							
Contract:							
Application No.: Applica	ation Date:						
Application Period: From	to						
1. Original Contract Price	\$ -						
2. Net change by Change Orders	\$ -						
3. Current Contract Price (Line 1 + Line 2)	\$ -						
4. Total Work completed and materials stored t	to date						
(Sum of Column G Lump Sum Total and Column J Unit Price Total) \$-							
5. Retainage							
a. X \$ - Work Completed = \$ -							
b. X \$ - Stored Materials = \$ -							
c. Total Retainage (Line 5.a + Line 5.b)	\$ -						
6. Amount eligible to date (Line 4 - Line 5.c)	\$ -						
7. Less previous payments (Line 6 from prior ap	plication)						
8. Amount due this application	<u>\$</u> -						
9. Balance to finish, including retainage (Line 3	- Line 4 + Line 5.c) <u>\$ -</u>						
 (1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment; (2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such liens, security interest, or encumbrances); and (3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective. 							
Contractor:	Date						
Becommended by Engineer	Approved by Owner						
	Dy						
Date: Approved by Funding Agency (If Pequired)							
Ry.	Bv:						
Title:	Title						
Date:	Date:						

Progress Estimation	ate - Lump Sum Work					Contr	actor's Applicat	ion for Payment
Owner: Engineer: Contractor: Project: Contract:					-	Owner's Project No. Engineer's Project N Contractor's Project	: o.: No.:	
Application No.:	Application Period:	From		to		-	Application Date	:
А	В	С	D	E	F	G	н	I
ltem No.	Description	Scheduled Value (\$)	Work Co (D + E) From Previous Application (\$)	ompleted This Period (\$)	Materials Currently Stored (not in D or E) (S)	Work Completed and Materials Stored to Date (D + E + F) (\$)	% of Scheduled Value (G / C) (%)	Balance to Finish (C - G) (\$)
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Progress Estima	ite - Lump Sum Work					Contr	actor's Applicat	ion for Payment
Owner: Engineer: Contractor: Project: Contract:					- - - -	Owner's Project No. Engineer's Project N Contractor's Project	: io.: No.:	
Application No.:	Application Period:	From		to			Application Date	::
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ltem No.	Description	Scheduled Value (\$)	Work Co (D + E) From Previous Application (\$)	This Period (\$)	Materials Currently Stored (not in D or E) (\$)	Work Completed and Materials Stored to Date (D + E + F) (\$)	% of Scheduled Value (G / C) (%)	Balance to Finish (C - G) (\$)
			Change Orders	I	I			
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		Original	Contract and Chang	e Orders				
	Project Totals	\$ -	\$ -	\$ -	\$ -	\$ -		\$ -

Progress	Estimate - Unit Price Work		Contractor's Ap	plicatior	1 for Payment										
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Application	No.: Application Period:	Application Period: From to									Application Date:				
Α	В	C D		E F		G	Н	1	J	К	L				
		Contract Information				Work Completed									
Bid Item No.	Description	Item Quantity	Units	Unit Price (\$)	Value of Bid Item (C X E) (\$)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) (\$)	Materials Currently Stored (not in G) (\$)	Work Completed and Materials Stored to Date (H + I) (\$)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) (\$)				
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Progress	Estimate - Unit Price Work		Contractor's Ap	plicatio	1 for Payment						
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Project:											
Contract:											
Application No.: Application Period:					Application Date:						
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			Contract Information			Work Completed					
Bid Item No.	Description	Item Quantity	Units	Unit Price (\$)	Value of Bid Item (C X E) (\$)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) (\$)	Materials Currently Stored (not in G) (\$)	Work Completed and Materials Stored to Date (H + I) (\$)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) (\$)
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Owner: Engineer: Contractor: Project: Contract:				Owner's Project No.: Engineer's Project No.: Contractor's Project No.:								
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This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by



Issued and Published Jointly by



AMERICAN COUNCIL OF ENGINEERING COMPANIES





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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
 - 1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 - 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 - 3. *Application for Payment*—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 - 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 - 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 - 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 - 7. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 - 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 - 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 - 10. Claim—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment of Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

- 11. Constituent of Concern—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. ("CERCLA"); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. ("RCRA"); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
- 12. *Contract*—The entire and integrated written contract between the Owner and Contractor concerning the Work.
- 13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
- 14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents. .
- 15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
- 16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
- 17. Cost of the Work—See Paragraph 13.01 for definition.
- 18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
- 19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
- 20. Engineer—The individual or entity named as such in the Agreement.
- 21. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
- 22. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.
- 23. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
- 24. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
- 25. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.

- 26. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
- 27. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
- 28. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
- 29. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.
- 30. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.
- 31. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.
- 32. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or "RPR" includes any assistants or field staff of Resident Project Representative.
- 33. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
- 34. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer's review of the submittals and the performance of related construction activities.
- 35. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.
- 36. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
- 37. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.
- 38. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
- 39. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

- 40. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.
- 41. *Successful Bidder*—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.
- 42. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
- 43. *Supplier*—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
- 44. *Technical Data*—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
- 45. Underground Facilities—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
- 46. Unit Price Work—Work to be paid for on the basis of unit prices.
- 47. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
- 48. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. Intent of Certain Terms or Adjectives:
 - The Contract Documents include the terms "as allowed," "as approved," "as ordered," "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable,"

"acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

- C. Day:
 - 1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.
- D. Defective:
 - 1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - a. does not conform to the Contract Documents; or
 - b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).
- E. Furnish, Install, Perform, Provide:
 - 1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 - 2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 - 3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.
 - 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words "furnish," "install," "perform," or "provide," then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.
- F. Unless stated otherwise in the Contract Documents, words or phrases that have a wellknown technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 – PRELIMINARY MATTERS

- 2.01 Delivery of Bonds and Evidence of Insurance
 - A. *Bonds*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

- B. *Evidence of Contractor's Insurance*: When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.
- C. *Evidence of Owner's Insurance*: After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.
- 2.02 *Copies of Documents*
 - A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
 - B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.
- 2.03 Before Starting Construction
 - A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.
- 2.04 Preconstruction Conference; Designation of Authorized Representatives
 - A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
 - B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 Initial Acceptance of Schedules

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 Electronic Transmittals

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.
- B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 Intent

- A. The Contract Documents are complementary; what is required by one is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.

3.02 Reference Standards

- A. Standards Specifications, Codes, Laws and Regulations
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.
- 3.03 *Reporting and Resolving Discrepancies*
 - A. *Reporting Discrepancies*:
 - 1. *Contractor's Verification of Figures and Field Measurements*: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
 - 2. *Contractor's Review of Contract Documents*: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
 - 3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.
 - B. *Resolving Discrepancies*:
 - 1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:

- a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
- b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.
- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 Commencement of Contract Times; Notice to Proceed

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day

after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

- 4.02 *Starting the Work*
 - A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.
- 4.03 *Reference Points*
 - A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.
- 4.04 *Progress Schedule*
 - A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.
 - B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.
- 4.05 Delays in Contractor's Progress
 - A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
 - B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
 - C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

- 1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
- 2. abnormal weather conditions;
- 3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
- 4. acts of war or terrorism.
- D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.
- E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.
- F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.
- G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

- 5.01 *Availability of Lands*
 - A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.
 - B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
 - C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.
- 5.02 Use of Site and Other Areas
 - A. Limitation on Use of Site and Other Areas:
 - 1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

- 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work*: During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.
- C. *Cleaning*: Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.
- D. *Loading of Structures*: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.
- 5.03 Subsurface and Physical Conditions
 - A. *Reports and Drawings*: The Supplementary Conditions identify:
 - 1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
 - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
 - 3. Technical Data contained in such reports and drawings.
 - B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and

procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

- 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
- 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 Differing Subsurface or Physical Conditions

- A. *Notice by Contractor*: If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:
 - 1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
 - 2. is of such a nature as to require a change in the Drawings or Specifications; or
 - 3. differs materially from that shown or indicated in the Contract Documents; or
 - 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review*: After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner's obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. Owner's Statement to Contractor Regarding Site Condition: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. Possible Price and Times Adjustments:
 - 1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;

- b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
- C. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.
- 2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or
 - b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice as required by Paragraph 5.04.A.
- 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
- 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

5.05 Underground Facilities

- A. *Contractor's Responsibilities*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:
 - 1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and
 - 2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:
 - a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 - b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;
 - C. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 - d. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor*: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming

aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

- C. *Engineer's Review*: Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. Owner's Statement to Contractor Regarding Underground Facility: After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. Possible Price and Times Adjustments:
 - 1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:
 - a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - C. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times; and
 - d. Contractor gave the notice required in Paragraph 5.05.B.
 - 2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.
 - 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

5.06 Hazardous Environmental Conditions at Site

- A. *Reports and Drawings*: The Supplementary Conditions identify:
 - 1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
 - 2. Technical Data contained in such reports and drawings.
- B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
 - 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
 - 2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
 - 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related

thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.
- H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.
- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and 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 or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the

Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

- B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.
- C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.
- D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.
- E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner's termination rights under Article 16.
- F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.
- 6.02 Insurance—General Provisions
 - A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.
 - B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
 - C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.
 - D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and

documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

- E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner's termination rights under Article 16.
- H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.
- I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests.
- J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner and other individuals and entities in the Contract.
- 6.03 *Contractor's Insurance*
 - A. *Workers' Compensation*: Contractor shall purchase and maintain workers' compensation and employer's liability insurance for:
 - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts.
 - 2. United States Longshoreman and Harbor Workers' Compensation Act and Jones Act coverage (if applicable).
 - 3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees (by stop-gap endorsement in monopolist worker's compensation states).
 - 4. Foreign voluntary worker compensation (if applicable).
 - B. *Commercial General Liability—Claims Covered*: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
 - 1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees.
 - 2. claims for damages insured by reasonably available personal injury liability coverage.
 - 3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.
 - C. *Commercial General Liability—Form and Content*: Contractor's commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:

- 1. Products and completed operations coverage:
 - a. Such insurance shall be maintained for three years after final payment.
 - b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
- 2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor's contractual indemnity obligations in Paragraph 7.18.
- 3. Broad form property damage coverage.
- 4. Severability of interest.
- 5. Underground, explosion, and collapse coverage.
- 6. Personal injury coverage.
- 7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.
- 8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, "Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured" or its equivalent.
- D. *Automobile liability*: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.
- E. Umbrella or excess liability: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer's liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.
- F. *Contractor's pollution liability insurance*: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor's operations and completed operations. This insurance shall be maintained for no less than three years after final completion.
- G. Additional insureds: The Contractor's commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.
- H. *Contractor's professional liability insurance*: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by a negligent error, omission, or act for which the insured party is legally liable. It shall be

maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

- I. *General provisions*: The policies of insurance required by this Paragraph 6.03 shall:
 - 1. include at least the specific coverages provided in this Article.
 - 2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.
 - 3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.
 - 4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.
 - 5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.
- J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.
- B. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- 6.05 *Property Insurance*
 - A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
 - 1. include the Owner and Contractor as named insureds, and all Subcontractors, and any individuals or entities required by the Supplementary Conditions to be insured under such builder's risk policy, as insureds or named insureds. For purposes of the remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding Supplementary Conditions, the parties required to be insured shall collectively be referred to as "insureds."
 - 2. be written on a builder's risk "all risk" policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, and materials

and equipment in transit, and shall insure against at least the following perils or causes of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact; aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; flood; collapse; explosion; debris removal; demolition occasioned by enforcement of Laws and Regulations; water damage (other than that caused by flood); and such other perils or causes of loss as may be specifically required by the Supplementary Conditions. If insurance against mechanical breakdown, boiler explosion, and artificially generated electric current; earthquake; volcanic activity, and other earth movement; or flood, are not commercially available under builder's risk policies, by endorsement or otherwise, such insurance may be provided through other insurance policies acceptable to Owner and Contractor.

- 3. cover, as insured property, at least the following: (a) the Work and all materials, supplies, machinery, apparatus, equipment, fixtures, and other property of a similar nature that are to be incorporated into or used in the preparation, fabrication, construction, erection, or completion of the Work, including Owner-furnished or assigned property; (b) spare parts inventory required within the scope of the Contract; and (c) temporary works which are not intended to form part of the permanent constructed Work but which are intended to provide working access to the Site, or to the Work under construction, or which are intended to provide temporary support for the Work under construction, including scaffolding, form work, fences, shoring, falsework, and temporary structures.
- 4. cover expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects).
- 5. extend to cover damage or loss to insured property while in temporary storage at the Site or in a storage location outside the Site (but not including property stored at the premises of a manufacturer or Supplier).
- 6. extend to cover damage or loss to insured property while in transit.
- 7. allow for partial occupation or use of the Work by Owner, such that those portions of the Work that are not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- 8. allow for the waiver of the insurer's subrogation rights, as set forth below.
- 9. provide primary coverage for all losses and damages caused by the perils or causes of loss covered.
- 10. not include a co-insurance clause.
- 11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
- 12. include performance/hot testing and start-up.
- 13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.
- B. *Notice of Cancellation or Change*: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

- C. *Deductibles*: The purchaser of any required builder's risk or property insurance shall pay for costs not covered because of the application of a policy deductible.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide notice of such occupancy or use to the builder's risk insurer. The builder's risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder's risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder's risk insurance.
- E. *Additional Insurance*: If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor's expense.
- F. *Insurance of Other Property*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 Waiver of Rights

- A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder's risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:
 - 1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and
 - 2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of

payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.

D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder's risk insurance and any other property insurance applicable to the Work.

6.07 Receipt and Application of Property Insurance Proceeds

- A. Any insured loss under the builder's risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

- 7.01 Supervision and Superintendence
 - A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
 - B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.
- 7.02 Labor; Working Hours
 - A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.
 - B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor

may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

- 7.03 Services, Materials, and Equipment
 - A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
 - B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
 - C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 *"Or Equals"*

- A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that:
 - 1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
 - 2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) it has a proven record of performance and availability of responsive service; and
 - 4) it is not objectionable to Owner.
 - b. Contractor certifies that, if approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request shall result in any change in Contract Price. The Engineer's denial of an "or-equal" request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

7.05 Substitutes

- A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.
 - 1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.
 - 2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.
 - 3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
 - a. shall certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design,
 - 2) be similar in substance to that specified, and
 - 3) be suited to the same use as that specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct

contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and

- 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
- C. will identify:
 - 1) all variations of the proposed substitute item from that specified, and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
- d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.
- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by timely submittal of a Change Proposal.
- 7.06 Concerning Subcontractors, Suppliers, and Others
 - A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner.
 - B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.
 - C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.

- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.
- E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.
- F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.
- H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions.
- J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.
- K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.
- L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.
- M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.
- N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

- O. Nothing in the Contract Documents:
 - 1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor
 - 2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 Patent Fees and Royalties

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 Permits

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work

7.09 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 Laws and Regulations

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.11 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 Safety and Protection

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss;

and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

- C. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. The Supplementary Conditions identify any Owner's safety programs that are applicable to the Work.
- D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.
- E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- F. Contractor's duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).
- G. Contractor's duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.
- 7.13 Safety Representative
 - A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.
- 7.14 Hazard Communication Programs
 - A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.
- 7.15 Emergencies
 - A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 Shop Drawings, Samples, and Other Submittals

- A. Shop Drawing and Sample Submittal Requirements:
 - 1. Before submitting a Shop Drawing or Sample, Contractor shall have:
 - a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
 - C. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - d. determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.
 - 2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
 - 3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.
- B. *Submittal Procedures for Shop Drawings and Samples*: Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.
 - 1. Shop Drawings:
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.
 - 2. Samples:
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.
 - 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Other Submittals*: Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
- D. Engineer's Review:
 - 1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 - 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
 - 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 - 4. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.
 - 5. Engineer's review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.
 - 6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
 - 7. Neither Engineer's receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.
 - 8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.
- E. *Resubmittal Procedures*:
 - 1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.
 - 2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.
 - 3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner

may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

- 7.17 *Contractor's General Warranty and Guarantee*
 - A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.
 - B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
 - C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:
 - 1. observations by Engineer;
 - 2. recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. use or occupancy of the Work or any part thereof by Owner;
 - 5. any review and approval of a Shop Drawing or Sample submittal;
 - 6. the issuance of a notice of acceptability by Engineer;
 - 7. any inspection, test, or approval by others; or
 - 8. any correction of defective Work by Owner.
 - D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.
- 7.18 Indemnification
 - A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.
 - B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor

or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

- C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer's officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:
 - 1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
 - 2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.
- 7.19 Delegation of Professional Design Services
 - A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.
 - B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.
 - C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.
 - D. Pursuant to this paragraph, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.
 - E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

- 8.01 Other Work
 - A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.
- D. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. an itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. the extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner's employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility

owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.
- C. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.
- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITIES

- 9.01 Communications to Contractor
 - A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.
- 9.02 Replacement of Engineer
 - A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents shall be that of the former Engineer.
- 9.03 Furnish Data
 - A. Owner shall promptly furnish the data required of Owner under the Contract Documents.
- 9.04 Pay When Due
 - A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 Lands and Easements; Reports, Tests, and Drawings

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.
- 9.06 Insurance
 - A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 Change Orders

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.
- 9.08 *Inspections, Tests, and Approvals*
 - A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.
- 9.09 Limitations on Owner's Responsibilities
 - A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- 9.10 Undisclosed Hazardous Environmental Condition
 - A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.
- 9.11 *Evidence of Financial Arrangements*
 - A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents (including obligations under proposed changes in the Work).
- 9.12 Safety Programs
 - A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
 - B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

- 10.01 Owner's Representative
 - A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 Visits to Site

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.
- 10.03 Project Representative
 - A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.
- 10.04 Rejecting Defective Work
 - A. Engineer has the authority to reject Work in accordance with Article 14.
- 10.05 Shop Drawings, Change Orders and Payments
 - A. Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.
 - B. Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.
 - C. Engineer's authority as to Change Orders is set forth in Article 11.
 - D. Engineer's authority as to Applications for Payment is set forth in Article 15.
- 10.06 Determinations for Unit Price Work
 - A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.
- 10.07 Decisions on Requirements of Contract Documents and Acceptability of Work
 - A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will

not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

- 10.08 Limitations on Engineer's Authority and Responsibilities
 - A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.
 - B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
 - C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
 - D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.
 - E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.
- 10.09 Compliance with Safety Program
 - A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs (if any) of which Engineer has been informed.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

- 11.01 Amending and Supplementing Contract Documents
 - A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
 - 1. Change Orders:
 - a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
 - b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.

- 2. *Work Change Directives*: A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.
- 3. *Field Orders*: Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.
- 11.02 Owner-Authorized Changes in the Work
 - A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer's recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.
- 11.03 Unauthorized Changes in the Work
 - A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.
- 11.04 Change of Contract Price
 - A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.
 - B. An adjustment in the Contract Price will be determined as follows:
 - 1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or

- 2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or
- 3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.04.C).
- C. *Contractor's Fee*: When applicable, the Contractor's fee for overhead and profit shall be determined as follows:
 - 1. a mutually acceptable fixed fee; or
 - 2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee shall be 15 percent;
 - b. for costs incurred under Paragraph 13.01.B.3, the Contractor's fee shall be five percent;
 - C. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor's fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;
 - d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and
 - f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 Change of Contract Times

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.
- B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor's progress.
- 11.06 Change Proposals
 - A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the

requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

- 1. *Procedures*: Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.
- 2. *Engineer's Action*: Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor's supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.
- 3. *Binding Decision*: Engineer's decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- B. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07 Execution of Change Orders

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and
 - 4. changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.
- 11.08 Notification to Surety
 - A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12 – CLAIMS

12.01 Claims

- A. *Claims Process*: The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:
 - 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 - 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
 - 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.
- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.
- D. Mediation:
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the conclusion of the mediation, as determined by the mediator.
 - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.

- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

- 13.01 *Cost of the Work*
 - A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
 - 2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
 - B. *Costs Included*: Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:
 - 1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
 - 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns

from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

- 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
- 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.
- 5. Supplemental costs including the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
 - C. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
 - d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
 - e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
 - f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.
 - g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

- i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. *Costs Excluded*: The term Cost of the Work shall not include any of the following items:
 - 1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 - 2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 - 5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.
- D. *Contractor's Fee*: When the Work as a whole is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 11.04.C.
- E. *Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. Cash Allowances: Contractor agrees that:
 - 1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 - 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.
- C. *Contingency Allowance*: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.
- 13.03 Unit Price Work
 - A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
 - B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
 - C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
 - D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.
 - E. Within 30 days of Engineer's written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
 - 1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
 - 2. there is no corresponding adjustment with respect to any other item of Work; and
 - 3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

- 14.01 Access to Work
 - A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply therewith as applicable.

14.02 Tests, Inspections, and Approvals

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required

by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.
- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
 - 1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 - 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 - 3. by manufacturers of equipment furnished under the Contract Documents;
 - 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 - 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 Defective Work

- A. *Contractor's Obligation*: It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority*: Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects*: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement*: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties*: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

F. *Costs and Damages*: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 Acceptance of Defective Work

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 Uncovering Work

- A. Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 Owner May Stop the Work

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 Owner May Correct Defective Work

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

- 15.01 Progress Payments
 - A. *Basis for Progress Payments*: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
 - B. Applications for Payments:
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for

Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

- 2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
- 3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.
- C. Review of Applications:
 - 1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
 - 2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
 - 3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
 - 4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work, or
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

- c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or
- d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
- e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
- 5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
- 6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - C. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.
- D. Payment Becomes Due:
 - 1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.
- E. Reductions in Payment by Owner:
 - 1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. claims have been made against Owner on account of Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;
 - b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. the Work is defective, requiring correction or replacement;

- g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
- h. the Contract Price has been reduced by Change Orders;
- i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;
- j. liquidated damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
- k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;
- I. there are other items entitling Owner to a set off against the amount recommended.
- 2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
- 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.
- 15.02 Contractor's Warranty of Title
 - A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.
- 15.03 Substantial Completion
 - A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.
 - B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
 - C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons

therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.
- 15.04 Partial Use or Occupancy
 - A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:
 - 1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.
 - 2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
 - 3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
 - 4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder's risk or other property insurance.

15.05 Final Inspection

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 Final Payment

- A. Application for Payment:
 - 1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.
 - 2. The final Application for Payment shall be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - C. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
 - d. a list of all disputes that Contractor believes are unsettled; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
 - 3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. Engineer's Review of Application and Acceptance:
 - 1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner

and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

- C. *Completion of Work*: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment.
- D. *Payment Becomes Due*: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer's recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.
- 15.07 Waiver of Claims
 - A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor's failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor's continuing obligations under the Contract Documents.
 - B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.
- 15.08 Correction Period
 - A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such other adjacent areas;
 - 2. correct such defective Work;
 - 3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.
 - B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

- C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.
- E. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

- 16.01 Owner May Suspend Work
 - A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.
- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 Owner May Terminate For Convenience

- A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.

16.04 Contractor May Stop Work or Terminate

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 Methods and Procedures

- A. *Disputes Subject to Final Resolution*: The following disputed matters are subject to final resolution under the provisions of this Article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and
 - 2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.
- B. *Final Resolution of Disputes*: For any dispute subject to resolution under this Article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18 – MISCELLANEOUS

- 18.01 *Giving Notice*
 - A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
 - 1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
 - 2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.
- 18.03 Cumulative Remedies
 - A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 Limitation of Damages

A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 No Waiver

- A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.
- 18.06 Survival of Obligations
 - A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 Controlling Law

- A. This Contract is to be governed by the law of the state in which the Project is located.
- 18.08 Headings
 - A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

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SECTION 00800

SUPPLEMENTAL CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC No. C-700, 2013 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not specifically amended or supplemented hereby remain in full force and effect.

ARTICLE 1. DEFINITIONS AND TERMINOLOGY

SC-1.01.A.13

Add the following language at the beginning of the definition entitled "Contract Documents" in the General Conditions:

The Invitation to Bid, Instructions to Bidders

SC-1.01.A.28

Add the following language to the definition entitled "Owner" in the General Conditions:

The "Owner" shall mean the Town of North Andover, Massachusetts acting through its Department of Public Works.

SC-1.01.A.40

Delete the definition of Substantial Completion in the General Conditions in its entirety and add the following in its place:

The Work required by the Contract has been completed except for work having a Contract Price of less than one percent of the then adjusted total contract price, or substantially all of the Work has been completed and opened to Owner's use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the Work required by the Contract.

SC-1.01.A.49

Add the following definition to the General Conditions:

"State" shall mean the Commonwealth of Massachusetts.

ARTICLE 2. PRELIMINARY MATTERS

SC-2.01.C

Delete this paragraph

SC-2.01.D

Add a new paragraph immediately after paragraph 2.01.C of the General Conditions, which is to read as follows:

D. Non-Resident Contractor: The CONTRACTOR, if a corporation established under laws other than the State in which the proposed construction is located, shall file with the OWNER, notice of the name of its resident attorney-in-fact, appointed as required by the laws of the State in which the proposed construction is located. The CONTRACTOR, if a resident of a State other than that in which the proposed construction is located and not a corporation, shall file, at the time of execution of the Agreement, with the OWNER a written appointment of a resident of the State in which the construction is located, having an office or place of business therein, to be his true and lawful attorney upon whom all lawful processes in any actions or proceedings against him may be served; and in such writing, which shall set forth said attorney's place of residence, shall agree that any lawful process against him which is served on said attorney shall be of the same legal force and validity as if served on him and that the authority shall continue in force so long as any liability remains outstanding against him in said State. The power of attorney shall be filed in the office of the Secretary of the State if required, and copies certified by the Secretary shall be sufficient evidence thereof. Such appointment shall continue in force until revoked by an instrument in writing, designating in a like manner some other person upon whom such processes may be served, which instrument shall be filed in the manner provided herein for the original appointment.

SC-2.05

Add the following paragraphs immediately after paragraph 2.05.A.3 of the General Conditions which is to read as follows:

2.05.A.4 Before any work at the site is started, CONTRACTOR shall deliver to OWNER, with a copy to ENGINEER, certificates of insurance (and other evidence of insurance requested by OWNER) which CONTRACTOR is required to purchase and maintain in accordance with the requirements of Article 6.

2.05.A.5 Contractor shall include and identify on the certificate of insurance, indemnification as required by Article 7.18.

ARTICLE 3. DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC-3.01

Add the following paragraphs immediately after paragraph 3.01.A of the General Conditions which is to read as follows:

3.01.A.1 Each and every provision of law and clause required by law to be inserted in the Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though they were included herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

3.01.A.2 Sections of Division 1 - General Requirements govern the execution of the work of all sections of the specifications.

SC-3.02.A.1

Delete the portion of the paragraph starting at "shall mean" through the end of this sentence and insert the following:

"shall mean the standard, specification, manual, code, or Laws or Regulations in effect and applicable at the time in question, except as may be otherwise specifically stated in the Contract Documents."

SC-3.03.A.3

Delete Paragraph 3.03.A.3 in its entirety and insert the following:

"CONTRACTOR shall be liable to OWNER and/or ENGINEER for failure to report any such conflict, error, ambiguity or discrepancy if Contractor knew or reasonably should have known thereof."

ARTICLE 4. COMMENCEMENT AND PROGRESS OF THE WORK

SC 4.01

Delete paragraph 4.01 in its entirety and insert the following in its place:

4.01 The Contract Time will commence to run on the day indicated in the Notice to Proceed.

SC-4.03.A

Add a new paragraph at the end of paragraph 4.03.A of the General Conditions which is to read as follows:

"4.03.B ENGINEER may check the lines, elevations, reference marks, batter boards, etc., set by CONTRACTOR, and CONTRACTOR shall correct any errors disclosed by such check. Such a check shall not be considered as approval of CONTRACTOR's work and shall not relieve CONTRACTOR of the responsibility for accurate and satisfactory construction and completion of the entire Work. CONTRACTOR shall furnish personnel to assist ENGINEER in checking lines and grades."

SC-4.04

Add the following paragraph after paragraph 4.04.A.2 of the General Conditions:

"3. The CONTRACTOR's resident superintendent shall attend monthly progress meetings at the site of the work with the ENGINEER and others as appropriate to review schedule status and such other pertinent subjects as may be listed on the agenda by the ENGINEER."

SC- 4.05.A

Delete Paragraph 4.05.A in its entirety.

SC-4.05.G

Delete Paragraph 4.05.G and insert the following in its place:

"Delays caused by or within the control of the OWNER: In such event, the CONTRACTOR'S sole remedy shall be an extension of the Contract Time. Notwithstanding anything to the contrary in the Contract Documents, CONTRACTOR shall not be eligible for any increase in the Contract Price on account of any delay in the Work, no matter by whom such delay is caused, and CONTRACTOR shall make no claim for such an increase, whether such claim is styled as a claim for delay damages, acceleration of work, loss of production, or otherwise."

ARTICLE 5. AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC-5.01

Add a new paragraph immediately after paragraph 5.01.A of the General Conditions which is to read as follows:

"5.01.A.1 If all lands and rights-of-way are not obtained as herein contemplated before construction begins, CONTRACTOR shall begin the Work upon such land and rights-of-way as OWNER has previously acquired and no claim for damages whatsoever will be allowed by reason of the delay in obtaining the remaining lands and rights-of-way. Should OWNER be prevented or enjoined from proceeding with the Work, or from authorizing its prosecution, either before or after the commencement, by reason of any litigation, or by reason of its inability to procure any lands or rights-of-way for the Work, CONTRACTOR shall not be entitled to make or assert claim for damage by reason of said delay, or to withdraw from the Agreement except by consent of OWNER. Time for completion of the Work will be extended as provided in Article 11, to such time as OWNER determines will compensate for the time lost by such delay."

SC-5.01.B

Delete Paragraph 5.01.B in its entirety.

SC-5.03

In paragraph 5.03.B insert the word "reasonably" before the word "rely" in the first line and insert the following at the end of the first sentence:

"; the OWNER does not warrant or guarantee the accuracy or completeness of the information therein, and the CONTRACTOR may not so rely to the extent that the CONTRACTOR knows, or reasonably should have known, of any inaccuracy or omission therein.

SC-5.04

Insert the following paragraph before Paragraph 5.04.A

"5.04 Differing Subsurface or Physical Conditions

In accordance with Massachusetts General Laws Chapter 30, Section 39N, if, during the progress of the Work, the CONTRACTOR or the OWNER discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the Contract Documents either the CONTRACTOR or the OWNER may

request an equitable adjustment in the Contract Price applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such request to the other party as soon as possible after such conditions are discovered. Upon receipt of such a request from the CONTRACTOR, or upon its own initiative, the OWNER will make an investigation of such physical conditions, and if they differ substantially or materially from those shown on the plans or indicated in the Contract Documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and Contract Documents and are of such a nature as to cause an increase or decrease in the cost of performance of the Work or a change in the construction methods required for the performance of the Work which results in an increase or decrease in the cost of the Work which results in an increase or decrease in the contract Price and the Contract shall be modified in writing accordingly."

SC-5.04.D.1

Delete Paragraph 5.04.D.1 in its entirety.

Add a new paragraph immediately after paragraph 5.04.D of the General Conditions which is to read as follows:

"5.04.E Adjustments resulting from actual subsurface or latent physical conditions from those indicated will be in accordance with Massachusetts General Law, Chapter 30, Section 39N and the applicable provisions of the Contract Documents."

SC-5.05.A

Insert the following new paragraph immediately after Paragraph 5.05.A.2:

"3. CONTRACTOR's attention is directed to the requirements of Massachusetts General Laws Chapter 82, Section 40, regarding the notification of owners of underground facilities."

SC-5.05.B

Delete the phrase "or was not shown or indicated with reasonable accuracy" following the words "Contract Documents" in the first sentence of Paragraph 5.05.B.

SC-5.06.B

Delete Paragraph 5.06.B in its entirety.

SC-5.06.C

Add the following at the end of Paragraph 5.06.C:

",or unless CONTRACTOR caused or contributed to such Hazardous Environmental Condition."

SC-5.06.E

Delete the second and third sentences of Paragraph 5.06.E.

SC-5.06.I

Delete Paragraph 5.06.I in its entirety.

SC-5.06.J

Delete the last sentence of Paragraph 5.06.J.

ARTICLE 6. BONDS AND INSURANCE

SC-6.01.A

Delete SC-6.01A in its entirety and replace with the following para:

"A. Contractor shall furnish a payment bond in an amount at least equal to fifty percent of the Contract Price, as security for the faithful payment of all of Contractor's obligations under the Contract. This bond shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract."

SC-6.02

Delete Paragraph 6.02.D in its entirety.

Add a new paragraph immediately after paragraph 6.02.J of the General Conditions which is to read as follows:

"K. If OWNER has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by CONTRACTOR in accordance with this Article 6 on the basis of its not complying with the Contract Documents, OWNER will notify CONTRACTOR in writing thereof within thirty days of the date of delivery of such certificates to OWNER in accordance with paragraph 2.01.B CONTRACTOR will provide such additional information in respect of insurance provided by him as OWNER may reasonably request."

SC-6.03

The limits of liability for the insurance required by paragraph 6.03 of the General Conditions shall provide the following coverages for not less than the following amounts or greater where required by Laws and Regulations:

6.03.A Workers' Compensation.

(1)	Worker's Compensation	\$1,000,000
(2)	Employer's Liability	\$1,000,000

6.03.B and 6.03.C Comprehensive General Liability including Operations/Premises, Contractor's Protective, Products/Completed Operations, and Personal Injury liabilities:
(1)	Bodily injury:	\$1,000,000 \$3,000,000	Each occurrence Annual aggregate
(2)	Property damage, including explosion, collapse and underground coverage:	\$1,000,000 \$3,000,000	Each occurrence Annual aggregate
	Property damage liability insurance shall provide coverage for property in the care, custody and control of the insured.		
(3)	Personal injury, with employment exclusion deleted:	\$3,000,000	Annual aggregate

The Contractual Liability required by paragraph 6.03.C of the General Conditions shall provide coverage for not less than the following amounts:

(1)	Bodily injury:	\$2,000,000 \$3,000,000	Each occurrence Annual aggregate
(2)	Property damage, including explosion, collapse and underground coverage:	\$1,000,000 \$3,000,000	Each occurrence Annual aggregate
(3)	General Aggregate	\$2,000,000	

6.03.D Comprehensive Automobile Liability including owned, hired and non-owned vehicles:

(1)	Bodily injury:	\$1,000,000 \$1,000,000	Each person Each accident
(2)	Property damage	\$1,000,000	Each occurrence

SC-6.04

Delete paragraph 6.04 of the General Conditions in its entirety and insert the following in its place:

6.04.A CONTRACTOR shall purchase and maintain a separate Owner's Protective Liability policy, issued to OWNER at the expense of CONTRACTOR, including OWNER and ENGINEER as named insured. This insurance shall provide coverage for not less than the following amounts:

6.04.A.1	Bodily Injury:	
	Each Occurrence	\$1,000,000
6.04.A.2	Property Damage:	
	Each Occurrence	\$1,000,000
	Annual Aggregate	\$1,000,000

SC-6.05

Delete Paragraph 6.05.A of the General Conditions in its entirety and insert the following in its place:

"A. CONTRACTOR shall purchase and maintain, until final payment, property insurance upon the Work at the site in an amount equal to the total bid price for the completed construction. This insurance shall include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER and ENGINEER's consultants in the Work, shall insure against the perils of fire and extended coverage, shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and shall include damages, losses and expenses rising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers, architects, attorneys and other professionals). This insurance shall be provided on the completed value form. If not covered under the "all risk" insurance or otherwise provided in these Supplementary Conditions, CONTRACTOR shall purchase and maintain similar property insurance on portions of the Work stored on and off the site or in transit when such portions of the Work are to be included in an Application for Payment."

Delete Paragraph 6.05.B of the General Conditions in its entirety and insert the following in its place:

"B. All the policies of insurance (or the certificates or other evidence thereof) required to be purchased and maintained by CONTRACTOR in accordance with paragraphs 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least thirty days' prior written notice has been given to OWNER by certified mail and will contain waiver provisions in accordance with paragraph 6.06.B."

SC-6.05.D

Delete Paragraph 6.05.D in its entirety and insert the following:

"OWNER may occupy or use a portion of the Work prior to Substantial Completion."

SC-6.06A

Delete Paragraph 6.06A in its entirety and insert the following:

"OWNER and CONTRACTOR intend that all policies of insurance purchased in accordance with the provisions of Article 6 will protect OWNER, CONTRACTOR, Subcontractors, and ENGINEER, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and officers, director, members, partners, employees, agents, consultants, and subcontractors or each and any of them) in such policies and will, where required to provided such insurance, provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby."

SC-6.06.C

Delete Paragraph 6.06.C in its entirety and replace with the following:

"The CONTRACTOR shall pay for all costs not covered because of the application of a policy deductible due under any of its insurance policies required hereunder."

SC-6.07

Delete paragraph 6.07.A of the General Conditions in its entirety.

Delete paragraph 6.07.B of the General Conditions in its entirety.

Delete paragraph 6.07.C of the General Conditions in its entirety.

ARTICLE 7. CONTRACTOR'S RESPONSIBILITIES

SC-7.01

Add the following new paragraph as follows:

"7.01.C The site superintendent may be a direct employee of the subcontractor provided that this individual has the full authority and responsibility of the general contractor's specified superintendent. The General Contractor shall submit a letter to the District and the Engineer stating who the supervisor is and defining his/her authority during all construction related activities."

SC-7.02.C – 7.02.G

Insert the following new paragraphs immediately after Paragraph 7.02.B:

- "C. Regular working hours are defined as Monday through Friday, excluding holidays, between the hours of 7:00 AM and 5:00 PM. Requests to work other than regular working hours shall be submitted to ENGINEER not less than 48 hours prior to any proposed change. Occasional unscheduled overtime on weekdays may be permitted provided it is approved by ENGINEER."
- "D. CONTRACTOR shall reimburse the OWNER for additional engineering and/or inspection costs incurred as a result of overtime work in excess of the regular working hours stipulated in Paragraph SC-7.02.C. At OWNER's option, overtime costs may either be deducted from the CONTRACTOR's monthly payment or deducted from the retainage held by OWNER until release of final payment. Overtime costs for the OWNER's personnel shall be based on the individual's current overtime wage rate. Overtime costs for personnel employed by the ENGINEER or OWNER's independent testing laboratory shall be calculated in accordance with the terms of their respective contracts with the OWNER."
- "E. This agreement is subject to the applicable provisions of the Contract Work Hours and Safety Standards Act, Public Law 87-581 87th Congress. No Contractor or Subcontractor contracting for any part of the Work shall require or permit any laborer or mechanic to be employed on the Work in excess of forty hours in any work week unless such laborer or mechanic receives compensation at a rate not less than one and one-half times that person's basic rate of pay for all hours worked in excess of forty hours in such work week."
- "F. CONTRACTOR and Subcontractors shall, insofar as practicable, give preference in the hiring of workers for the Project to qualified local residents with first preference being given to citizens of the United States who have served in the armed forces of the United States and have been honorably discharged therefrom or released from active duty therein.

"G. CONTRACTOR shall employ only competent persons to do the work and whenever OWNER shall notify CONTRACTOR, in writing, that any person on the Work appears to be incompetent, disorderly, or otherwise unsatisfactory, such person shall be removed from the Project and shall not again be employed on it except with the consent of OWNER."

SC-7.04.A

Insert the following at the end of the third sentence of Paragraph 7.04.A:

", and in accordance with G.L. c.30, §39M."

Add a new paragraph SC-7.04.A.1.c immediately after paragraph 7.04A.1.b, which is to read as follows:

"c. It shall be CONTRACTOR's responsibility to coordinate all submittals to ENGINEER for approval to eliminate any conflicts which might arise due to the use of "or equal" items. Any additional costs incidental to the use of "or equal" items shall be paid by CONTRACTOR."

SC-7.06

Add the following to Paragraph 7.06.A:

"CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization, (including those who are to furnish the principal items of materials or equipment), whether initially or as a substitute, against whom OWNER makes reasonable objection. Acceptance of any Subcontractor, other person or organization by OWNER shall not constitute a waiver of any right of OWNER to reject defective Work."

7.06.H.1

Add the following paragraph immediately after paragraph 7.06.H:

1. CONTRACTOR shall make payments to Subcontractors in accordance with Massachusetts General Laws Chapter 30, Section 39F."

Add the following new paragraph as follows:

"7.06.J.1 OWNER or ENGINEER may furnish to any such Subcontractor, Supplier, or other person or organization, to the extent practicable, information about amounts paid to CONTRACTOR in accordance with CONTRACTOR's Applications for Payment on account of the particular Subcontractor's, Suppliers, other person's, or other organization's Work."

SC-7.06

Add the following language at the beginning of paragraph 7.06.L of the General Conditions:

"Except as otherwise required by Massachusetts General Law, Chapter 149, Section 44F,"

SC-7.07.A

Delete the second sentence of Paragraph 7.07.A.

SC-7.07.B

Delete this subparagraph.

SC-7.09

Add the following language at the end of paragraph 7.09.A of the General Conditions:

"7.09.A.1 The materials and supplies to be used in the Work under this Contract are exempt from the Sales and Use Tax of the Commonwealth of Massachusetts. Contractor shall obtain the proper certificates, maintain the necessary records, and otherwise comply with all applicable requirements governing the exemption from sales tax."

SC-7.10C

Delete the last sentence of Paragraph 7.10C.

SC-7.11.B – C

Insert the following new paragraphs immediately after Paragraph 7.11.A:

- "B. The CONTRACTOR shall return to the ENGINEER one set of the Contract Drawings marked in colored pencil, showing all changes made during construction and including the location, by dimensions and elevations, of installed equipment, and underground facilities that will become concealed or buried by the construction. This shall include ties to all concealed work, etc. measured from permanent structures. Additionally, the CONTRACTOR shall be required to keep marked-up drawings current and on site and to provide mark-ups to the OWNER on a monthly basis.
- "C. CONTRACTOR shall comply with all applicable provisions of Chapter 30, Section 39R of the Massachusetts General Laws regarding CONTRACTOR's records."

SC-7.12.E

Delete the text in parentheses in Paragraph 7.12.E.

SC-7.16

Add the following new paragraph immediately after paragraph 7.16.E of the General Conditions, which is to read as follows:

"7.16.F The accuracy of all such information submitted by the Contractor is the responsibility of the Contractor. In reviewing Shop Drawings, Samples, and similar submittals, the Engineer shall be entitled to rely upon the Contractor's representation that such information is correct and accurate."

SC-7.17.E

Add the following new paragraph 7.17.E, immediately after paragraph 7.17.D of the General Conditions:

"E. CONTRACTOR shall guarantee all materials and equipment furnished and Work performed for a period of two (2) years from the date of Substantial Completion.

CONTRACTOR warrants and guarantees for a period of two (2) years from the date of Substantial Completion that the completed Work is free from all defects due to faulty materials or workmanship and CONTRACTOR shall promptly make such corrections as may be necessary by reason of any such defects including the repairs of any damage to other parts of the Work resulting from such defects. In the event that CONTRACTOR should fail to make such repairs, adjustments, or other work that may be made necessary by such defects, OWNER may do so and charge CONTRACTOR the cost thereby incurred."

SC-7.18.A

Delete the phrase in parentheses: "(other than the Work itself)" in Paragraph 7.18.A.

Change the phrase "negligent act or omission" to "negligent or willful or wrongful act or omission."

SC-7.18.B

Insert the following at the end of Paragraph 7.18.B:

"If, through the acts or neglect of CONTRACTOR, any other Contractor or any Subcontractor shall suffer loss or damage on the Work, CONTRACTOR shall settle with such other Contractor or Subcontractor by agreement if such other Contractor or Subcontractor will so settle. If such other Contractor or Subcontractor or Subcontractor shall assert any claim against OWNER on account of any damage alleged to have been sustained, OWNER shall notify CONTRACTOR, who shall indemnify and hold harmless OWNER against any such claims."

ARTICLE 8. OTHER WORK AT THE SITE

SC-8.02

Delete Paragraph 8.02 in its entirety.

SC-8.03

Delete paragraph 8.03.D of the General Conditions in its entirety, and insert the following in its place:

"8.03.D Should CONTRACTOR cause damage to the work or property of any separate contractor at the site, or should any claim arising out of CONTRACTOR'S performance of the Work at the site be made by any separate contractor against CONTRACTOR, OWNER, ENGINEER, ENGINEER'S Consultants, or any other person, CONTRACTOR shall promptly attempt to settle with such other contractor by agreement, or to otherwise resolve the dispute by arbitration or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold OWNER, ENGINEER, and ENGINEER'S Consultants, harmless from and against all claims, damages, losses, and expenses (including, but not limited to, fees of engineers, architects, attorneys, and other professionals, and court and arbitration costs) arising directly, indirectly, or consequentially out of any action, legal or equitable, brought by any separate contractor against OWNER, ENGINEER, or ENGINEER'S Consultants, to the extent based on a claim arising out of the CONTRACTOR'S performance of the Work. Should a separate contractor cause damage to the Work or property of CONTRACTOR or should the performance of Work by any separate contractor at the site give rise to any other claim, CONTRACTOR shall not institute any action, legal or equitable, against OWNER, ENGINEER, or ENGINEER'S Consultants or permit any action against any of them to be maintained and continued in its name or for its benefit in any court or before any arbiter which seeks to impose liability on or to recover damages from OWNER, ENGINEER, or ENGINEER'S Consultants, on such action or claim. If CONTRACTOR is delayed at any time in performing or furnishing Work by any act or neglect of a separate contractor and OWNER and CONTRACTOR are unable to agree to the extent of any adjustment in Contract Times attributable thereto, CONTRACTOR may make a claim for an extension of times in accordance with Article 12.02. An extension of the Contract Times shall be CONTRACTOR'S exclusive remedy with respect to OWNER, ENGINEER, and ENGINEER'S Consultants, for any delay, disruption, interference or hindrance caused by any separate contractor. This paragraph does not prevent recovery from OWNER, ENGINEER, or ENGINEER'S Consultant, for activities that are their respective responsibilities."

ARTICLE 9. OWNER'S RESPONSIBILITIES

SC-9.02.A

Delete the phrase "provided Contractor makes no reasonable objection to the replacement engineer" in Paragraph 9.02.A.

SC-9.06

Delete paragraph 9.06 of the General Conditions in its entirety.

SC-9.09

Insert the following after the first sentence of Paragraph 9.09.A:

"However, the OWNER shall have the right to direct the CONTRACTOR to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto."

ARTICLE 10. ENGINEER'S STATUS DURING CONSTRUCTION

SC-10.01

Add a new paragraph 10.01.B after paragraph 10.01.A of the General Conditions, which is to read as follows:

"B. Nothing contained in the Contract Documents shall be construed to create a contractual relationship of any kind (1) between the ENGINEER and CONTRACTOR, (2) between the OWNER and a Subcontractor or Subcontractors, or (3) between any person or entities other than the OWNER and CONTRACTOR. The ENGINEER shall, however, be entitled to performance and enforcement of obligations under the CONTRACT DOCUMENTS intended to facilitate performance of the ENGINEER'S duties."

SC-10.02B

Insert the following at the end of Paragraph 10.02.B:

"However, the ENGINEER shall have the right to direct the CONTRACTOR to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto."

SC-10.03

Delete the last sentence of Paragraph 10.03.A

Add a new paragraph immediately after paragraph 10.03.A of the General Conditions as follows:

"10.03.B ENGINEER will furnish a Resident Project Representative and assistants to assist ENGINEER in observing the performance of the Work. The duties and responsibilities of the Resident Project Representative will be as enumerated in a document entitled "Duties, Responsibilities, and Limitations of the Authority of Resident Project Representative" and will be made available to CONTRACTOR at the start of his work."

SC-10.08.B

Insert the following after the first sentence in Paragraph 10.08.B:

"However, the ENGINEER shall have the right to direct the CONTRACTOR to perform the Work according to any sequence schedule set forth in the Contract Documents or established pursuant thereto."

SC-10.08.F

Add a new paragraph immediately after paragraph 10.08.E of the General Conditions which is to read as follows:

"ENGINEER'S interpretations will be made in accordance with Massachusetts General Laws Chapter 30, Section 39P."

ARTICLE 11. AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

SC-11.02

Add a new paragraph immediately after paragraph 11.02.A of the General Conditions which is to read as follows:

"11.02.A.1 ENGINEER'S interpretations will be made in accordance with Massachusetts General Law, Chapter 30, Section 39P."

SC-11.02

Add the following new paragraph immediately after paragraph 11.02.A of the General Conditions, which is to read as follows:

"11.02.B Upon request of the Owner or Engineer, the Contractor shall without cost to the Owner submit to the Engineer, in such form as the Engineer may require, an accurate written estimate of the cost of any such proposed extra Work or change. The estimate shall indicate the quantity and unit cost of each item of materials, and the number of hours of work and hourly rate for each class of labor, as well as the description and amounts of all other costs chargeable under the terms of this Article. Unit labor costs for the installation of each item of materials shall be shown if required by the Engineer. The Contractor shall promptly revise and resubmit such estimate if the Engineer determines that it is not in compliance with the requirements of this Article, or that it contains errors of facts or mathematical errors. If required by the Engineer, in order to establish the exact cost of new Work added or previously required Work omitted, the Contractor shall

obtain and furnish to the Engineer bona fide proposals from recognized suppliers for furnishing any material included in such Work, and shall be furnished at Contractor's expense. The Contractor shall state in the estimate any extension of time required for the completion of the Work if the change or extra work is ordered."

SC-11.04

In paragraph 11.04.C.2.a change "15 percent" to "10 percent".

Delete paragraph 11.04.C.2.c

ARTICLE 12. CLAIMS

SC-12.01

Add a new paragraph immediately after paragraph 12.01.D.1 of the General Conditions to read as follows:

"12.01.D.1.a CONTRACTOR shall carry on the Work and maintain the progress schedule during the dispute resolution proceedings unless otherwise agreed in writing by OWNER and CONTRACTOR."

ARTICLE 13. COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

SC-13.01

Add the following to the end of paragraph 13.01.B of the General Conditions to read as follows:

"Following the Notice of Award and prior to the execution of the AGREEMENT the OWNER, prospective contractor and, if any, each prospective filed subbid contractor shall agree on what percentage markup shall be used as direct labor costs in determination of extra work costs."

In the second sentence of paragraph 13.01.B.1 delete the word "superintendents".

SC-13.01.B.5

Delete subparagraphs a, d, e, f, g, and h of Paragraph 13.01.B.5.

SC-13.03.E

Delete Paragraph 13.03.E in its entirety.

SC-13.02

Delete paragraph 13.02 of the General Conditions in its entirety.

SC-13.03.E

Delete Paragraph 13.03.E in its entirety.

ARTICLE 14. TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

SC-14.02.F

Delete the remainder of Paragraph 14.02.F after the words "Contractor's expense."

SC-14.05.C.2

Delete Paragraph 14.05.C.2 in its entirety.

SC-14.06.B

Insert the following new paragraph immediately after Paragraph 14.06.A:

"B. If Owner stops Work under paragraph 14.06.A, CONTRACTOR shall not be entitled to any extension of Contract Time or increase in Contract Price."

ARTICLE 15. PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC-15.01

Delete the first phrase prior to the words "Contractor shall" in the first sentence of Paragraph 15.01.B.1 and insert the following:

"On a monthly basis and in accordance with G.L. c.30, §39G,".

Add new paragraphs immediately after paragraph 15.01.B.1 of the General Conditions to read as follows:

"15.01.B.1.a Only the following items of material and equipment will be accepted for delivery at the site or at a local bonded warehouse and included in progress estimates in advance of actual requirement, subject to all conditions stated below.

15.01.B.1.b Materials and equipment listed above will not be included in progress estimates until the requirements stated herein have been fulfilled.

15.01.B.1.c The Contractor must present an invoice to the Engineer for each item of material or equipment he is requesting payment for. The invoice must be broken down to show the costs for the actual equipment, and reasonable costs for O&M Manuals, spare parts, start-up certification, training, testing, final acceptance testing, and any other services required by Contract.

15.01.B.1.d Sufficient monies have been allocated in the payment requisition line items to cover all of the costs listed in "a" above, plus the costs of physically installing the equipment.

15.01.B.1.e The equipment has been submitted and approved for use in this Project.

15.01.B.1.f The Contractor has, at the time of delivery, given the Engineer written notice of the delivery using the form provided by the Engineer.

15.01.B.1.g The equipment is acceptably stored and protected. Storage in a bonded warehouse will require proof of bonding, and insurance coverage specifically for the item being stored.

15.01.B.1.h The manufacturer's short and/or long term storage requirements have been received by the Engineer, prior to payment.

15.01.B.1.i The Contractor has established a program to implement the manufacturer's required storage procedures. Said program to consist of at the very least a written schedule of daily, weekly, monthly, routine maintenance requirements for each piece of equipment. A copy of this schedule to be presented to the Engineer prior to each requisition submittal, signed by the Contractor, stating that the required maintenance has been performed.

15.01.B.1.j Signed, notarized Title Transfers, format to be furnished by the Engineer, must be furnished for each item of equipment.

15.01.B.1.k When the above have been complied with to the satisfaction of the Engineer, payment will be authorized for the full invoice values of the item of equipment, less normal retainage and less all costs for O&M Manuals, spare parts, start-up certification, training, testing, final acceptance testing, and installation."

Delete paragraph 15.01.B.3 and insert the following in its place:

"15.01.B.3. Retainage with respect to progress payments will be five percent or, if stipulated, the maximum allowed by law."

SC-15.01.B.4

Insert the following new paragraph immediately after Paragraph 15.01.B.3:

"4. CONTRACTOR shall furnish evidence that payment received on the basis of materials and equipment not incorporated and suitably stored, has in fact been paid to the respective supplier(s) within ten (10) days of payment by OWNER. Failure to provide such evidence of payment may result in the withdrawal of previous approval(s) and removal of the cost of related materials and equipment from the next submitted Application for Payment.

SC-15.01.C.1

Delete Paragraph 15.01C.1 and insert the following:

"1. Progress Payments shall be made in accordance with Massachusetts General Laws, Chapter 30, Section 39G."

SC-15.01.D.1

Delete Paragraph 15.01.D.1 and insert the following:

"1. Payment shall be made in accordance with G.L. c.30, §39G."

SC-15.01.E.2

Delete the words "immediate" and "promptly" in the first sentence of Paragraph 15.01.E.2.

SC-15.01.E.3

Delete this Paragraph in its entirety.

SC-15.02

Insert the following new paragraphs immediately after Paragraph 15.02.A:

- "B. No materials or supplies for the Work shall be purchased by CONTRACTOR or Subcontractor subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. CONTRACTOR warrants that CONTRACTOR has good title to all materials and supplies used by CONTRACTOR in the Work, free from all liens, claims or encumbrances."
- "C. CONTRACTOR shall indemnify and save OWNER harmless from all claims growing out of the lawful demands of Subcontractors, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in the furtherance of the performance of this Contract. CONTRACTOR shall, at OWNERS request, furnish satisfactory evidence that all obligations of the nature hereinabove designated have been paid, discharged, or waived. If CONTRACTOR fails to do so, then OWNER may, after having served written notice on the CONTRACTOR, either pay unpaid bills, of which OWNER has written notice, or withhold from the CONTRACTOR's unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged whereupon payment to CONTRACTOR shall be resumed, in accordance with the terms of this Contract, but in no event shall the provisions of this sentence be construed to impose any obligation upon OWNER to either CONTRACTOR, or CONTRACTOR's Surety. In paying any unpaid bills of the CONTRACTOR, OWNER's payment shall be considered as payment made under the Contract by OWNER to CONTRACTOR and OWNER shall not be liable to CONTRACTOR for any such payment made in good faith."

SC-15.03.C

Delete the third sentence of Paragraph 15.03.C and insert the following:

"OWNER may review the preliminary certificate and make written objection to ENGINEER as to any provisions of the certificate or attached list."

Delete the phrase ", within 14 days after submission of the preliminary certificate to OWNER," in the fourth sentence of paragraph 15.03.C.

Delete the phrase ", within said 14 days," in the fifth sentence of Paragraph 15.03.C.

SC-15.04.A

Delete the phrase "subject to the following conditions" at the end of the first sentence of Paragraph 15.04.A.

Delete Paragraph 15.04.A.2 in its entirety.

SC-15.06

Delete Paragraph 15.06.B.1 and insert the following:

"1. If, on the basis of ENGINEER's observations of the Work during construction and final inspection, and ENGINEER's review of the final Application for Payment and accompanying documentation, all as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, ENGINEER will indicate in writing ENGINEER's recommendation of payment and present the Application for Payment to OWNER for payment. Thereupon ENGINEER will give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 15.07. Otherwise, ENGINEER will return the Application for Payment to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application for Payment. If the Application and accompanying documentation are appropriate as to form and substance, OWNER will, in accordance with the applicable provisions of Massachusetts General Laws, pay CONTRACTOR the amount recommended by the ENGINEER."

SC-15.06.D

Insert the following at the end of Paragraph 15.06.D:

"Final payment shall be made in accordance with G.L. c.30, §39G."

ARTICLE 16. SUSPENSION OF WORK AND TERMINATION

SC-16.01.A

Delete Paragraph 16.01.A in its entirety and insert the following:

"A. OWNER may suspend the work or any portion thereof in accordance with G.L. c.30, \$390."

SC-16.02.A.5

Insert new paragraph immediately after Paragraph 16.02.A.4:

"5. If CONTRACTOR abandons the Work, or sublets this Contract or any part thereof, without the previous written consent of OWNER, or if the Contract or any claim thereunder shall be assigned by CONTRACTOR otherwise than as herein specified."

SC-16.02.B.2

Delete Para. 16.02.B.2 in its entirety.

SC-16.02.C

Delete the phrase "Subject to the terms and operation of any applicable performance bond,"

SC-16.02.F

Delete the words "performance bond"

SC-16.02.G

Delete Para. 16.02.G in its entirety.

SC-16.03.A.1

Delete the phrase "including fair and reasonable sums for overhead and profit on such Work" in Paragraph 16.03.A.1.

SC-16.03.A.2

Delete the phrase "plus fair and reasonable sums for overhead and profit on such expenses" in Paragraph 16.03.A.2.

SC-16.03.A.3

Delete Paragraph 16.03.A.3 in its entirety.

SC-16.04.B

Delete the last sentence of Paragraph 16.04.B.

ARTICLE 17. FINAL RESOLUTION OF DISPUTES

SC-17.01.C

Insert a new sub-paragraph after Paragraph 17.01.B:

"CONTRACTOR shall carry on the Work and maintain the progress schedule during the dispute resolution proceedings, unless otherwise agreed by CONTRACTOR and OWNER in writing."

SC-17.02

Add a new paragraph immediately after Paragraph 17.01 of the General Conditions which is to read as follows:

"17.02 Venue

Any legal action relating to this Contract shall be filed in the Superior Court for the County in the Commonwealth of Massachusetts in which the Project is located, unless otherwise agreed by CONTRACTOR and OWNER in writing."

ARTICLE 18. MISCELLANEOUS

SC-18.08

18.08 Headings:

Delete paragraph 18.08.A and replace with the following paragraph:

"18.08.A The headings or titles of any article, paragraph, subparagraph, section, subsection, or part of the Contract Documents shall not be deemed to limit or restrict the article, paragraph, section, or part."

18.09 Legal Address of Contractor

Add the following paragraph immediately after section 18.08:

"18.09.A CONTRACTOR'S business address and his office at or near the site of the Work are both hereby designated as places to which communications shall be delivered. The depositing of any letter, notice, or other communication in a postpaid wrapper directed to the CONTRACTOR'S business address in a post office box regularly maintained by the Post Office Department or the delivery at either designated address of any letter, notice, or other communication by mail or otherwise shall be deemed sufficient service thereof upon CONTRACTOR, and the date of such service shall be the date of receipt. The first-named address may be changed at any time by an instrument in writing, executed and acknowledged by CONTRACTOR and delivered to ENGINEER. Service of any notice, letter, or other communication upon the CONTRACTOR personally shall likewise be deemed sufficient service."

SC-18.10

Insert the following new paragraph:

- "SC-18.10 Wage Rates
- "A. The requirements and provisions of all applicable laws and any amendments thereof or additions thereto as to employment of labor, and to the schedule of minimum wage rates established in compliance with laws shall be a part of the Contract Documents. If after the Notice of Award, it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rates as shall be determined by the officials administering the laws mentioned above."
- "B. The schedule of wages referred to above is minimum rates only, and OWNER will not consider any claims for additional compensation made by CONTRACTOR because of payment by CONTRACTOR of any wage in excess of the applicable, required rates."

END OF SECTION 00800

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DIVISION 1

GENERAL REQUIREMENTS

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SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 LOCATION OF WORK

A. The Work of this Contract is located in the Town of North Andover, Massachusetts along Great Pond Road and Lake Cochichewick, approximately located opposite 1939 great Pond Road.

1.3 SUMMARY

- A. The work under this Contract includes but is not necessarily limited to the reconstruction of the existing boat launch with a permeable paver boat launch, reconstruction of the lakeside retaining wall with a mechanically stabilized earth (MSE) concrete block retaining wall, permeable paver driveways and parking areas, stormwater control measures (SCMs), loam and seeding, native tree plantings, and all necessary appurtenances and incidentals to complete the work as shown on the Design Drawings, and as specified herein.
- B. A sequence of work has been provided on Sheet G-1 of the Design Drawings. The Contractor shall conduct work according to this sequence.

1.4 SCOPE OF WORK

- A. A general description of the work to be performed under this Contract for the Base Bid shall include, but will not necessarily be limited to the following construction operations:
 - 1. Coordination of all construction activities with the appropriate local and State Authorities, and utility companies, including support of utility poles and guy wire removal and resetting. MSE concrete block retaining walls require North Andover Building Department permit that shall be completed by the Contractor.
 - 2. Attending the Pre-construction meetings, the required job progress meetings, and project closeout meetings. The Contractor shall assume progress meeting will take place once per week during active construction.
 - 3. Submission of a construction schedule, list of subcontractors, and proposed source locations for off-site materials, including, but not limited to: vegetative layer and additive(s), crushed stone, ordinary borrow, and concrete.

- 4. Review and comply with all permits including: North Andover Order of Conditions (OOC), North Andover Watershed Special Permit (WSP), MESA Determination Letter and Consultation Update, Secretary's Certificate on the Single Environmental Impact Report (EIR), USACE Pre-Construction Notification (PCN), 401 Water Quality Certification (WQC) and Ch 91 License. Provide the \$20,000 Cash Bond directly to the North Andover Conservation Commission (NACC) as noted in the NACC Order of Conditions (OOC) as well as acknowledgement of each page of the OOC to the NACC. The Cash Bond shall be returned upon final approval of the Certificate of Completion (CoC) after a two (2) year monitoring period.
- 5. Provide access for a biologist to conduct Pond-Mussel sweeps prior to the disturbance of work in Lake Cochichewick.
- 6. Submission of all required submittals, in a timely manner, to the Engineer, for review.
- 7. Mobilization and demobilization to and from the project site.
- 8. Staking limits of work, limits of clearing, and all trees proposed to be removed.
- 9. Install and maintain erosion controls, turbidity curtain, and cofferdam. Replace erosion controls that are no longer in serviceable condition. Erosion controls will be installed in 2-phases as shown on the Design Drawings. Dewatering may be completed in 2-phases as described on the Design Drawings.
- 10. Perform clearing, grubbing, and demolition within the project limits.
- 11. Perform earthwork cut and fills for rough grade along waterfront and throughout remaining work area. Soils cuttings may be reused if acceptable based on the specification requirements. If the Contractor requests to reuse soils, it shall be tested to prove it meets requirements.
- 12. Construct retaining wall, revetments, and boat launch ramp.
- 13. Install utilities and stormwater system (including drainage structure, piping, and bioretention areas).
- 14. Install stone-filled concrete pavers and grass-filled concrete pavers. Coordinate with the North Andover Fire Chief before finalizing the permeable paver access driveway layout to the boat launch ramp. North Andover Fire Department shall test drive the driveway access prior to installing the final paver system.
- 15. Install additional surface features, including loam and seed, rip-rap and pavement driveway apron.
- 16. Install site accessories, including permanent signage, moving existing

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boulders for placement around the driveway, removal and of existing double post message board and installation at the location determined by the Engineer, and removable-lockable bollards.

- 17. Maintenance and repair of all work for a period of one (1) year warranty period following the issuance of the Certificate of Substantial Completion. Provide maintenance, repair, and replacement of all growth for a period of two (2) years warranty period following the installation of all plantings and loam and seeding.
- B. The Work shall also conform to such additional Drawings and addenda to these Specifications and Drawings as may be published or exhibited prior to the opening of bid proposals and to such Drawings in explanation of details, or as may be furnished by the Engineer from time to time during the construction.
- C. Work, materials, equipment, and storage areas, which are necessary for construction, but which are not specifically referred to in the Specifications or shown on the Drawings, but implied by the contract, shall be furnished by the Contractor at his own cost and expense, and shall be such as will correspond with the general character of the Work, as may be determined by the Engineer, whose decisions as to the necessity for and character of such work and materials shall be final and conclusive. It is the intent of these Specifications to produce a complete, finished job, whether shown in every detail or not.

1.5 CONTRACTOR'S USE OF PREMISES

- A. Contractor shall limit the use of the premises for his/her Work and for storage to allow for:
 - 1. Owner occupancy, including Easements.
 - 2. Public Use.
- B. Coordinate use of premises with Owner.
- C. Contractor shall assume full responsibility for security of all his/her and his/her subcontractors' materials and equipment stored on the site.
- D. If directed by the Owner or Engineer, move any stored items which interfere with operations of Owner or other contractors.
- E. Obtain and pay for use of additional storage areas or work areas as necessary and required to perform the Work.

1.6 OWNER OCCUPANCY

A. Owner will occupy premises during performance of the Work for the conduct of his/her normal operations. Coordinate all construction operations with Owner to minimize conflict and to facilitate Owner usage.

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- B. A general description of the Work to be performed under this contract shall include, but will not be limited to, the following construction operations:
 - 1. Coordination of all construction activities with the appropriate local and State authorities and utilities.
 - 2. Attending the pre-construction conference and required job progress meetings.
 - 3. Submission of a construction schedule, list of subcontractors and submission of all required shop drawings, in a timely manner, to the Engineer for review.
 - 4. Mobilization to the site.
 - 5. Protection of existing structures and installation of environmental control measures.

1.7 UTILITIES

A. The utilities shown on the plans have been located primarily from information furnished by others and are considered approximate both as to size and location. It shall be the Contractor's responsibility to locate all existing utilities and to protect same from damage or harm. All utilities interfered with or damaged shall be properly restored, at the expense of the Contractor, to the satisfaction of its Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01010

SECTION 01024

MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.1 SUMMARY

- A. Under the price specified to be paid for each item, the Contractor shall furnish all materials and equipment, furnish all labor and plant and perform all operations to complete all work as indicated and specified. Provide all supervision, overhead items, bond and permit costs, protection and precautions and all other costs incidental to the construction work, complete, and as specified, are also included.
- B. A complete, finished, working job, as intended by the general nature of these Specifications, shall be produced whether or not any particular wording or direction is omitted or inadvertently not clearly stated.
- C. Measurement for payment shall be by the Engineer, except where noted elsewhere in this Specification. Measurement for payment for lump sum items shall be on the basis of percentage of work complete and in place.
- D. Each unit or lump sum price stated in the Bid shall constitute full compensation as herein specified for each item of work completed in accordance with the Drawings and Specifications.
- E. The prices for those items which involve excavation shall include compensation for disposal of surplus excavated material, dewatering, treatment, and disposal of groundwater, and any required shoring or bracing for compliance with OSHA regulations.
- F. The prices for all pipe items shall constitute full compensation for furnishing, laying, jointing, cleaning, flushing, chlorinating and testing of pipe; excavation and backfill; and clean up.
- G. The trench width pay limit for pipe shall be as follows and take precedence over any conflicts with pay limits:
 - 1. Pipe ID equal to or less than 24": maximum of 5' where depth of excavation is 6 feet deep or less, or 7' where the excavation is greater than 6 feet deep.
 - 2. Pipe ID greater than 24" and equal to or less than 36": maximum of 6' where depth of excavation is 6 feet deep or less, or 8' where the excavation is greater than 6 feet deep.
- H. The trench width pay limit for precast concrete structures extending 2.5' beyond the edge of the structure.

- I. In all Items involving excavation, the price shall be based on doing the entire excavation in earth. Where rock is excavated, the price thereof shall be in addition to the cost of excavating earth, and no deduction will be made in the amount for earth excavation.
- J. Unit prices submitted for various Items of work will be utilized for determining prices of any additional work necessary during construction.
- K. Final payment shall not be issued until the Contractor submits project record drawings approved by the Engineer.
- L. In accordance with Chapter 150 of the Acts of 2013 (An Act Relative to Price Adjustments for Certain Materials in Construction Projects), specifically Section 38A, of Massachusetts General Laws Chapter 30, the following materials will be eligible for price adjustments in accordance with the Appendices and applicable Specification Sections: fuel (both diesel and gasoline); liquid asphalt; and, portland cement (contained in cast-in-place concrete). The noted material price adjustments are applicable on a monthly basis only when the monthly cost change in base prices exceeds +/- 5%.
- 1.2 Item Descriptions Base Bid
 - A. Item 1: Mobilization and Demobilization
 - 1. Under the lump sum for Item 1, the Contractor shall mobilize and demobilize to and from the Site all labor, materials and equipment, to complete all work associated with the utility work and appurtenances Demobilization from the Site includes, but is not limited to, removal of all equipment and final cleanup to the satisfaction of the Owner and Engineer. The cost shall not exceed 5 percent of the total of bid items 2-25 inclusive.
 - 2. Payment of the lump sum price bid in the Bid Form for Item 1 shall be full compensation for all costs associated with initiation and closeout of the Contract, exclusive of the cost of materials, with 50% payable on completion of mobilization. Payment shall include compensation for all insurance, bonds, including the North Andover Conservation Commission (NACC) \$20,000 Cash Permit Bond, site preparation, construction equipment delivery, and in general the costs associated with establishing and terminating the work on site. There shall be no additional costs for any remobilization.
 - B. Item 2: Turbidity Curtain, Portable Dam, Dewatering, and Treatment
 - 1. Payment for Item 2 includes installation of the turbidity curtain and portable cofferdam in Lake Cochichewick, 24-hour dewatering operations, and dewatering treatment during construction until all work in Lake Cochichewick is complete and accepted by the Engineer. Item 2 shall include but not be limited to furnishing all labor, materials, equipment, tools, shipping and incidentals, including a Massachusetts P.E. stamped dewatering plan and

product submittals; temporary portable cofferdams; turbidity curtains; pumps, generators, piping, and tubing; fuel; secondary fuel containment; maintenance; frac tank and dewatering bags for total suspended solids treatment; daily water quality monitoring for total suspended solids, monitoring water levels; scour protection; excavation; backfill of all disturbed areas; compaction; surface restoration; construction fencing as necessary to facilitate dewatering, compliance with all permitting, and all else incidental thereto, for which separate payment is not provided under other items in the bid form to provide dewatering and treatment as shown on the design plans and as specified herein.

- 2. Measurement for payment for Item 2 shall be on a lump sum basis. Fifty percent (50%) of the lump sum price shall be paid after successful implementation of the dewatering system as determined by the Engineer. Fifty percent (50%) will be paid based on percentage of the work completed starting once the implementation of the dewatering system is complete and ending when the dewatering system is planned for demobilization and removal from the site as determined by the Engineer.
- C. Item 3: Mechanically Stabilized Earth (MSE) Block Retaining Wall
 - 1. Payment for Item 3 shall include furnishing all labor, materials, equipment, tools, shipping and incidentals necessary to demolish the existing retaining wall, remove vegetation, and install the MSE Block Retaining wall as specified herein and as shown on the Design Drawings. This item shall include but is not limited to a Massachusetts Licensed Structural Professional Engineer certified plans and calculations; P.E. stamped and certified shop drawing and design calculations for geotechnical design; local building permit and associated fees; structural backfill, crushed stone, crushed stone base, unit fill, 4" drain tile, geotextile; furnishing and installing the MSE block retaining wall, wall drainage system; compaction; final site grading in front of and behind the MSE block retaining wall as necessary to meet proposed grades or existing grades, excavation of unsuitable soils, support of excavation; tree removal, clearing and grubbing; local dewatering (not included in Item 2), and all else incidental thereto, for which separate payment is not provided under other items in the bid form.
 - 2. Measurement for payment shall be made on a per square foot basis of the wall surface installed complete in place, as determined by the Engineer. No additional payments shall be made for excess or waste materials.
- D. Item 4: Permeable Paver Boat Launch
 - 1. Payment for Item 4 shall include furnishing all labor, materials, equipment, tools, shipping and incidentals necessary to demolish the existing boat launch, clearing all vegetation, and install the Permeable Paver Boat Launch as specified herein and as shown on the Design Drawings. This item shall include but is not limited to demolition of the existing failed asphalt and

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concrete boat launch and soils and sediment to the depth shown on the design drawings; furnishing and installing processed gravel, crushed stone, rip-rap, stone revetment boulders, geotextile; geotextile filter fabric; geogrid; permeable pavers and paver edging; compaction; final grading as necessary to meet proposed grades or existing grades, disposal of unsuitable soils, support of excavation, local dewatering (not included in Item 2), cutting and site fabrication; tree removal and clearing and grubbing; and all else incidental thereto, for which separate payment is not provided under other items in the bid form (except rock excavation covered under item 22).

- 2. Measurement for payment for Item 4 shall be made on a lump sum basis as the percentage of work completed as approved by the Engineer. No additional payments shall be made for excess or waste materials. The extents of Item 4 shall be from proposed grade EL 115' to its terminus in Lake Cochichewick. Grades above EL 115' shall be covered under Item 8.
- E. Item 5: Rip-Rap Bank Stabilization
 - 1. Under the unit price bid this Item, the Contractor shall furnish all tools, equipment, labor, and materials required to complete all work shown on the Design Drawings and specified herein. The work includes clearing and grubbing, grading, re-using and installing native rock from existing wall, placement of geotextile fabric, disposal of topsoil, vegetation, and any debris, and all else incidental thereto for which separate payment is not provided under other items in the Bid Form (except rock excavation covered under item 22). Supplement native rock with furnish sourced rock if amounts are not available on-site.
 - 2. Payment to stabilize the slope as shown on the Design Drawings will be on a lump sum basis. Measurement shall be made as the percentage of work completed as determined by the Engineer.
- F. Item 6: Site Clearing, Grubbing, and Tree Removal
 - 1. Payment under the lump sum bid price for Item 6 shall include furnishing all labor, materials, tools, devices, and equipment to complete the clearing, grubbing, and tree removal within the proposed project limits, as shown on the design drawings and specified herein. Work under this item includes but is not limited to the removal and proper disposal of trees, brush, grass, stubs, topsoil and other obstacles on the site; and all other incidentals and appurtenances required to clear and grub the site as indicated in the drawings and specified herein.
 - 2. Measurement for payment of Item 6 shall be made on a lump sum basis as the percentage of work completed as approved by the Engineer. The limits of clearing and grubbing are up to the limit of work as shown on the plans surrounding the site and up to the proposed retaining wall, boat launch, and riprap bank stabilization areas (Items 3, 4, and 5 respectively).

G. Item 7: Site Grading

- 1. Payment under the lump sum bid price for Item 7 shall include furnishing all labor, materials, tools, devices, and equipment to complete grading the project site and installing the construction entrance as shown on design drawings and specified herein. Grading includes but is not limited to the cutting and filling (backfill), demolition of all excess materials and properly disposing, compaction, reuse of underburden and overburden, screening, fill material, crushed stone, rip-rap, dust control; local dewatering (not included in Item 2); and all other incidentals and appurtenances required to grade the site as indicated in the drawings and specified herein in preparation for surface restoration (except rock excavation covered under item 22).
- 2. The work under Item 7 shall also include, additional common fill, when required and approve, shall be provided, placed, and compacted as trench backfill to replace unsuitable materials and for miscellaneous uses.
- 3. Measurement for payment for Item 7 shall be made on a lump sum basis as the percentage of work completed as approved by the Engineer. The limits of grading are up to the limit of work as shown on the plans.
- H. Item 8: Permeable Concrete Pavers
 - 1. Payment for Item 8a and 8b for permeable concrete pavers shall include furnishing all labor, materials, equipment, tools, shipping and incidentals necessary to install the permeable concrete pavers as specified herein and as shown on the Design Drawings. This item shall include but is not limited to furnishing and installing: structural backfill, crushed stone, geotextile; permeable pavers and paver edging; paver stone fill and paver loam and seed fill; compaction; fine grading as necessary to meet proposed grades or existing grades, disposal of unsuitable soils, support of excavation, local dewatering (not included in Item 2), cutting and site fabrication; and all else incidental thereto, for which separate payment is not provided under other items in the bid form.
 - 2. Measurement for payment for Item 8a and 8b shall be made on a square yard basis measured complete in place at the paver surface as approved by the Engineer. No additional payments shall be made for excess or waste materials.
- I. Item 9: 12" RCP Drain Pipe
 - 1. RCP drain pipe under this Item shall be measured in place on a linear foot basis. Measurement for payment does not signify that the pipe is accepted. Measurement for length will be along the horizontal centerline of the pipe with no deduction for fittings and will be to the inside edge of manholes.

- 2. Payment for this Item will be made at the Contract unit price stated in the Bid Proposal for the quantities as measured in place on a linear foot basis. The Contractor shall provide all labor, materials, tools, equipment, and incidentals required for construction of class IV RCP complete flush to structure interior walls. Payment shall be considered full compensation for providing cutting and disposal of existing pavement; trench excavation (except rock excavation covered under item 22); dewatering systems, proper discharge of ground water as specified herein; all labor, materials, equipment, tools and incidentals for temporary catch basin connections or temporary pumping during wet weather, including inserting and removing pipe plugs, pumps, pump setup, piping, gasoline/diesel fuel, secondary containment, maintenance, transportation and storage, stand-by pumping equipment, service piping, stand-by pumping equipment, pumping flows; support of excavation, bedding with crushed stone for pipe; backfilling with suitable excavated material, removal and disposal of unsuitable excavated material, compaction and steel plating prior to final paving; filter fabric; restoring the trench surface to grade needed for trench pavement; all restoration required within the trench limits; protection or temporary removal and replacement of existing utilities and structures; laying, jointing, cleaning and testing the pipe; water for construction; temporarily plugging open ends and bracing the plug; replacement of any curbing removed or disturbed within trench limits; insulation; fittings; connections to existing drains including couplings; connections to new structures, access to compacted backfill for compaction testing; and all incidental work, including; removal and disposal of excess excavated material from the jobsite; and all else incidental thereto, for which separate payment is not provided under other items in the Bid Form.
- J. Item 10: 12" Drain Flared End Section and 2-ft Dia. Drain Structure
 - 1. Item 10a and 10b will be measured for each structure installed complete in place, as accepted by the Engineer.
 - 2. Payment for providing precast concrete drainage structures complete in place will be made for the quantity as determined at the price per structure in the Bid Form. This price and payment shall be full compensation for providing all pavement saw cutting and disposal; excavation (except rock excavation covered under item 22); support of excavation; crushed stone bedding; filter fabric; backfilling with suitable excavated material; removal and disposal of unsuitable excavated material; precast sections and bases, platforms, manhole rungs, preformed pipe openings; field pipe openings (when required); all forms, reinforcing, concrete and masonry materials; hydraulic cement; top slabs for shallow manholes if used; compaction and compaction testing; frames and grates; flared end sections; brick and mortar levelling as necessary to bring frame to grade; dewatering including installation and maintenance of dewatering systems during installation operations as required; proper discharge of ground water as specified herein; and all else incidental thereto, for which separate payment is not provided under other items in the Bid Form.

K. Item 11: Fill Materials

- 1. Under the unit price bid for Item 11a, the Contractor shall furnish and place additional crushed stone, as specified or directed by the Engineer. Measurement for payment will be on the basis of cubic yards of material placed to the designated thickness as measured in place, as shown in the Drawings or as specified.
- 2. Under the unit price bid for Item 11b, the Contractor shall furnish and place riprap as specified or directed by the Engineer. Included in this cost will be clearing and grubbing; excavation; filter fabric, and hand placed rip-rap, earthwork, compaction and all materials, equipment and services necessary to satisfactorily place rip-rap inlet and outlet controls or as directed by the Engineer.
- 3. Payment for furnishing and placing crushed stone and rip-rap will be made for the quantity determined above at the respective price bid for Items 11a and 11b in the Bid Form. This price and payment shall be full compensation for furnishing, hauling, placing, compacting, access for compaction testing and inspections, and all else incidental thereto for which separate payment is not provided under other items in the Bid Form.
- 4. Payment for crushed stone and rip-rap used in sub-base for manholes, structures, and pipe will be included under their respective items. Payment for crushed stone for the retaining wall, boat launch, concrete pavers, structures and pipe will be included under their respective items. Payment for rip-rap for the boat launch and bank stabilization are included under their respective items.
- 5. Payment for common fill materials to refill rock and boulder excavation will be included under Item 22.
- 6. No payment will be made under Item 11 for excavated backfill materials that are re-used for the project.
- L. Item 12: Additional Excavation of Unsuitable Materials:
 - 1. Under the unit price bid for this Item, the Contractor shall excavate below the specified depth to clear utilities or match existing mains, or to remove peat or other unsuitable material, below the grade of pipe, when and as directed by the Engineer; load, transport, and waste such material away from the job as directed; furnish and place approved fill material in the place of material removed.
 - 2. Measurement for payment will be on the basis of cubic yards of material excavated within the detailed trench payment width and at authorized depth, as measured by the Engineer.
- M. Item 13: Electrical Handholes

- 1. Under the unit price bid for Item 13, the Contractor shall install the electrical handholes boxes, as shown on the Drawings. The unit price for this item shall include all materials, labor and equipment necessary for trench excavation (except rock excavation covered under item 22); trench bedding, concrete encasement, and all backfill materials, including compaction; support of excavation; protection of utilities; local dewatering (not covered under Item 2); disposal of excavated materials; permit compliances; and all else incidental thereto, for which separate payment is not provided under other items in the Bid Form.
- 2. Payment for this item shall be based on each electrical handhole installed complete in place as determined by the Engineer.
- N. Item 14: 4" PVC Electrical Conduit
 - 1. Under the unit price bid for Item 14, the Contractor shall install two (2) 4" PVC electrical conduits empty with wire pull ropes for future use, as shown on the Drawings. The unit price for this item shall include all materials, labor and equipment necessary for trench excavation (except rock excavation covered under item 22); trench bedding, concrete encasement, and all backfill materials, including compaction; support of excavation; protection of utilities; local dewatering (not covered under Item 2); disposal of excavated materials; permit compliances; metallic tracer tape; wire pull ropes; and all else incidental thereto, for which separate payment is not provided under other items in the Bid Form.
 - 2. Payment for this Item shall be measured in place on a linear foot basis for two (2) parallel PVC electrical conduits. Measurement for length will be along the horizontal centerline of the between the two (2) conduits with no deduction for fittings and will be to the inside edge of manholes.
- O. Item 15: 3.5" Miscellaneous Pavement (Driveway)
 - 1. The quantities of pavement, for roadways, driveways, sidewalks, and parking lots, Type I-1 bituminous pavement, to be measured for payment under the appropriate subdivisions of Item 15 will be measured based on the number of square yards as measured in place (approximate coefficient of 0.056 tons per square yard per inch of thickness). Measurement of pavement over trenches shall be limited to a maximum pay limit width listed on the Drawings. The Contractor shall maintain pavement in good repair and flush with the existing pavement at all times during the duration of the Contract. If defects occur in surfacing constructed by the Contractor, remove bituminous concrete and sub-base and replace sub-base material and bituminous concrete as is necessary to properly correct defect. Also included for payment under the appropriate subdivisions of Item 15 are the services, labor, equipment and materials required to adjust existing valve, gas and service boxes, castings and structures, not included for payment elsewhere, where required.
 - 2. The work under Item 15 shall also include processed gravel, when its use is

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approved and when furnished, shall be provided, placed and compacted for pavement subbase to replace unsuitable materials and for miscellaneous uses. No allowance will be made for loss from consolidation of material.

- 3. Payment for hand placement of bituminous paving materials in driveways, waterways, and runoffs shall be made at the unit price bid under Item 15, including up to 3.5-inch thick base courses and top courses shown on the drawings and specified herein. The price bid shall include all labor, materials, and equipment necessary to complete the work as specified.
- P. Item 16: Loam and Seed
 - 1. Payment for loam and seed under Items 16a and 16b for Infiltration Basins and all other areas shall be made at the unit price bid for this Item per square yard of area to be loam and seeded within the limit of work. Measurement for payment shall be based on the square yards of material placed obtained by multiplying the length of area by the width of material placed to a maximum width as stated on the Drawings and Specifications.
 - 2. Payment will be made under this item for all labor, materials and equipment required to perform the work as specified, including loam, seed (as specified for each area), fertilizer, watering, and all other incidentals required for growth. No payment will be made for loam and seed or sod until areas are properly fertilized, watered, lime applied, and growth occurs.
- Q. Item 17: Trees
 - 1. Payment for tree plantings shall be made at the unit price bid for Item 17. Measurement for payment shall be per each tree planting when complete.
 - 2. Payment will be made under this item for all labor, materials and equipment required to perform the work as specified. No payment will be made for replanting trees prior to the plants first planting season. Payment shall include proper excavation, plantings, mulching, topsoil, fertilizer, watering, staking, ropes, and all work and furnishings required to complete the work.
- R. Item 18: Railings and Fences
 - 1. Payment for Items 18a and 18b shall include furnishing all labor, materials, equipment, tools, shipping and incidentals necessary for railings and fences, including the 36-inch tall wooden post rope fence and 42-inch tall aluminum safety rail as specified herein and on the Design Drawings. Work shall include safety railings and fences, posts, post holes, sonotubes for aluminum face, welding, drilling, bolts and fastening accessories, rails, rope, post caps, backfill, compaction, backfill material, concrete for posts, and all incidentals required to install the railings and fencing complete.
 - 2. Payment for Items 18a and 18b shall be measured complete in place on a linear foot basis along the fence and railing centerline with no deductions for posts.

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S. Item 19: New Guardrail

- 1. The bid unit price for this item shall constitute full compensation to the Contractor for furnishing all labor, materials, tools, devices, and equipment necessary to replace and install new steal guardrail beams and post, furnish and install spacers, and installation of the guardrail complete in accordance with the latest MassDOT Highway Division Construction Details, Design Drawings, and Specifications herein, including but not limited to metal posts, TL-2 corten beams, offset blocks, splices, and appurtenances.
- 2. Payment for this Item shall be made based on the linear feet of guardrail installed complete as measured by the Engineer.
- T. Item 20: Site Accessories
 - 1. Payment for Item 20 shall include furnishing all labor, materials, equipment, tools, shipping and incidentals necessary for site accessories including removable locking bollards, double wide swing gate, site signage, moving and installing existing boat racks, placing existing on-site boulders around driveway, and removing, storing, and re-installing the existing double posted wooden message board as specified herein and as shown on the Design Drawings. This item shall include but is not limited to demolition; furnishing and installing: site accessories, concrete, backfill; furnishing and installing the compaction; disposal of unsuitable soils, support of excavation; local dewatering (not included in Item 2), and all else incidental thereto, for which separate payment is not provided under other items in the bid form.
 - 2. Measurement for payment shall be made on a lump sum basis of the percentage of work completed based on the Engineer approved schedule of values, as determined by the Engineer. No additional payments shall be made for excess or waste materials.
- U. Item 21: Filter Sock
 - 1. Under the unit price for this Item, the Contractor shall furnish and place filter sock sedimentation barriers for sedimentation/erosion control where shown on the Drawings.
 - 2. Payment will be made at the unit price per linear foot of barrier furnished and installed. Payment will be based on the length of the barrier placed and measured by the Engineer. Payment will include all costs for labor, materials, and equipment required to furnish, install, maintain, replace, remove and dispose of barriers.
- V. Item 22: Silt Fence
 - 1. Under the unit price for Item 22, the Contractor shall furnish and place silt

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fence for sedimentation/erosion control and protecting wetlands where shown on the Drawings.

- 2. Payment will be made at the unit price bid per linear foot of barrier furnished and installed for Item 22. Payment will be based on the length of barrier placed as measured by the Engineer. Payment will include all costs for labor, materials, and equipment required to furnish, install, maintain, replace, remove and dispose of barriers.
- W. Item 23: Silt Sacks
 - 1. Under the unit price for this Item, the Contractor shall furnish, place and maintain silt sacks for sedimentation/erosion control and protecting catch basins, drains, etc., where shown on the Drawings.
 - 2. Payment will be made at the unit price bid for each silt sack furnished and installed. Payment will be based on the number of silt sacks placed as measured by the Engineer. Payment will include all costs for labor, materials, and equipment required to furnish, install, maintain, replace, remove and dispose of silt sacks.
- X. Item 24: Rock Excavation
 - 1. Under the unit price bid for this Item, the Contractor shall excavate, remove, and dispose of ledge and rock from trenches and excavated areas. Included in the price bid per cubic yard shall be related costs such as hoe-ramming, expansive grout or similar materials, drilling, pre-blast survey, blasting, and replacement with suitable and compacted gravel borrow material, removal, and disposal of excavated material. Rock that is excavated by normal excavation methods will not be measured under this Item.
 - 2. Measurement for payment will be on the basis of cubic yards of ledge or rock excavated as measured by the Engineer.
- Y. Item 25: Allowance for Material and Soil Testing
 - 1. This Item is an allowance item as stated in the Bid Form.
 - 2. Measurement shall be as measured by the Engineer for costs associated with material testing.
 - 3. Payment shall be direct cost (no mark-up is allowed on this item) to provide compaction and concrete testing performed by a qualified technician certified in "soils" by the New England Transportation Technician Certification Program (NETTCP) and "concrete" by the Massachusetts Construction Industry Board (MCIB) using the methods described in the Specifications. Only compaction tests and concrete testing that meets the requirements of the Specifications shall be eligible for payment under this item. Retesting and work

performed to obtain proper compaction is not eligible for payment under this Item and shall be paid by the Contractor without reimbursement by the owner. Testing shall be performed at depths and locations determined by the Engineer.

- 4. Payment shall also include soil testing for chemical testing of soils and sediments to determine soil classification for re-use or disposal using the methods described in the Specifications.
- 5. Payment shall be 100% based upon submittal of invoices, showing no outstanding balance, and/or certified payrolls. Contractor shall not receive payment for any unused portion of the allowance for compaction.
- Z. Item 26: Sediment Disposal
 - 1. Under the unit bid price for Item 26a, the Contractor shall furnish all labor, materials, tools, devices, and equipment required for Removal and Disposal of Contaminated and Impacted Soils. The work includes, but is not limited to: submittal of work plans; providing a Licensed Site Professional (LSP), handling, loading, transporting, and legally disposing at an appropriately permitted solid waste facility, according to Section 02080 and 02095, all soil/fill which is unsuitable for on-site reuse and is defined as a impacted solid waste according to Section 02080; all requirements for a staging area or dewatering area as included in Section 02080; placing, grading and compacting the material at the disposal facility as specified; and all testing, fees, permits, and taxes.
 - 2. Under the unit bid price for Item 26b, the Contractor shall furnish all labor, materials, tools, devices, and equipment required for Removal and Disposal of Unimpacted and Uncontaminated Sediment. The Work includes, but is not limited to: submittal of work plans; decanting/dewatering, handling, loading, transporting, and legally disposing at an appropriately permitted solid waste facility according to Section 02080 and 02095, all sediment which is defined as a uncontaminated solid waste according to Section 02080; all requirements for a staging area or dewatering area as included in Section 02080; placing, grading and compacting the material at the disposal facility as specified; and all testing, fees, permits, and taxes.
 - 3. Item 26 shall be measured on the basis of tons of waste actually disposed, as measured at the disposal facility by certified scale, and documented on the return manifest or certified weight slip and accompanied by the Material Shipping Record (MSR) or Bill of Lading (BOL), as appropriate.
 - 4. Material excavated outside of the pay limits indicated elsewhere in the Contract Documents or as directed by the Engineer shall be done at the Contractor's expense, at no additional cost to the Owner.

AA. Item 27: Miscellaneous Work

- 1. Under the lump sum price for this Item, the Contractor shall provide all general construction services, overhead items, labor, materials, supplies, consumables, and equipment necessary to complete all work required to construct the work identified on the Drawings, which is not included in Bid Items 1 through 26. This shall include, but is not limited to, the following:
 - a. Field engineering including site layout and control, the establishment of vertical and horizontal site control, construction line and grade, and layout.
 - b. Attending the construction kick-off meeting, pre-construction conference and all required job progress and community meetings, and coordination of all construction activities with the appropriate local authorities and utilities.
 - c. Submission of all schedules, lists, laboratory test results, materials and sources, survey documentation, and shop drawings, as required, in a timely manner to the Engineer for review and approval.
 - d. Maintenance and repair of all work for a period of one (1) year warranty period following the issuance of the Certificate of Substantial Completion. Provide maintenance, repair, and replacement of all growth for a period of two (2) years warranty period following the installation of all plantings and loam and seeding.
 - e. Providing a Site-Specific Health and Safety Plan for the Contractor's employees in accordance with the minimum standards set forth in OSHA 29 CFR 1910.120 and 29 CFR 1926.
 - f. Provide and maintain sanitary facilities and OSHA compliant site protection during construction.
 - g. Provide record drawings at the completion of the project as Specified in Section 01300. Record drawings shall be completed by a MA Professional Land Surveyor (PLS).
 - h. Construction, maintenance, and removal of equipment entrance and wash down area, as required.
 - i. All laboratory testing not included in other items, including precast concrete material testing and sieve analysis and modified proctor of excavated materials to determine backfill suitability.
 - j. Coordination with utility companies and payments for support of utility poles as to safely perform the work.

- k. Traffic management, including signage, notifications, cones, barrels, lighting, submission of traffic management plans (as needed) for approval by the Engineer, coordination of police details, and all other incidentals in connection with traffic management. Payment for uniformed police officers will be billed directly to the North Andover DPW by the Police Department in the normal course of providing supervision for traffic control during construction operations. No payment will be authorized by the Town for police details ordered by the Contractor but not utilized due to cancellation of work crews.
- 1. Coordination of all construction activities with the Engineer and/or the Owner's Site Representative.
- m. Compliance and work associated with the Conservation Commission Order of Conditions (OOC), Planning Board Special Watershed Permit, U.S. Army Corps General Permit, MassDEP Water Quality Certification, Ch. 91 License, MEPA EIR, MassWildlife Endangered Species Requirements, and all local and state construction permits including a building permit.
- n. All other project related direct and indirect costs not described above.
- o. Overhead items, supervision, record keeping, administration, and permitting.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01024
SECTION 01040

PROJECT COORDINATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions, Division 0 and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY OF WORK

- A. This section specifies administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to:
 - 1. Coordination.
 - 2. Administrative and supervisory personnel.
 - 3. General installation provisions.
 - 4. Cleaning and protection.
- B. Progress meetings and preconstruction conferences are included in Section 01200 Project Meetings.
- C. Requirements for the Contractor's Construction Schedule are included in Section 01300 Submittal Procedures and Section 01311 Construction Progress Schedules.

PART 1 - PRODUCTS (NOT USED)

PART 2 - EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Inspect the conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner, and at no additional cost to the Owner.
- B. Manufacturer's Written Instructions: Comply with manufacturer's written installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in the Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items, and at no additional cost to the Owner.

- D. Provide attachment and connection devices and methods for securing work. Secure work true to line and level. Allow for expansion and utility movement.
- E. Recheck measurements and dimensions before starting installation or erection.
- F. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material to prevent deterioration.
- G. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

3.2 CLEANING AND PROTECTION

- A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Install protective covering to ensure protection from damage or deterioration.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period.
- C. Contractor shall be required to sweep public and private roadways to remove all materials related to project activities. The frequency of sweeping shall be based on the condition of the affected roadway.
- D. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
 - 1. Excessive static or dynamic loading.
 - 2. Excessive internal or external pressures.
 - 3. Excessively high or low temperatures.
 - 4. Air contamination or pollution.
 - 5. Water or ice.
 - 6. Solvents.
 - 7. Chemicals.
 - 8. Misalignment.
 - 9. Unprotected storage.
 - 10. Improper shipping or handling.

11. Theft.

12. Vandalism.

3.3 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700 - Contract Closeout

END OF SECTION 01040

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SECTION 01046

CONTROL OF WORK

PART 1 – GENERAL

1.1 EQUIPMENT

A. Furnish equipment which will be efficient, appropriate, and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the Contract Time. If at any time such equipment appears to the Engineer to be inefficient, inappropriate, or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he/she may order the Contractor to increase the efficiency, change the character or increase the plant equipment and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his/her obligations to secure the quality of the work and rate of progress required.

1.2 GENERAL INSTALLATION PROVISIONS

- A. Inspection of Conditions: Inspect the conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner, and at no additional cost to the Owner.
- B. Manufacturer's Written Instructions: Comply with manufacturer's written installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in the Contract Documents.
- C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items at no additional cost to the Owner.
- D. Provide attachment and connection devices and methods for securing Work. Secure Work true to line and level. Allow for expansion and utility movement.
- E. Recheck measurements and dimensions before starting installation or erection.
- F. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material to prevent deterioration.
- G. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

1.3 HOURS OF CONSTRUCTION

A. Normal construction activity shall take place only between the hours of 7 a.m. to 5 p.m. Monday through Friday, excluding Saturdays, Sundays, and legal Town holidays.

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Work outside the above time periods will be permitted only on an emergency basis and only with the approval of the Owner and Engineer.

B. No work shall be performed on this project on Saturdays, Sundays, and Holidays, or on the Friday after a Thursday Holiday. Work is also restricted on the day before and the day after a long Holiday weekend without prior written approval by the Owner.

1.4 PRIVATE LAND

A. The Contractor shall not enter or occupy private land outside of temporary access agreements and construction easements, except after the written consent of the owners or their agents. Any damage caused to this area during construction is the responsibility of the Contractor and must be restored to its original condition at no additional cost to the Town.

1.5 HAULING, HANDLING, AND STORAGE OF MATERIALS

A. The Contractor shall, at his own expense, handle, and haul all materials furnished by him and shall remove any and all of his surplus materials at the completion of the work. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by him that are liable to injury, and shall be responsible for any loss or damage to any equipment or materials by theft, breakage, or otherwise. The Contractor shall be responsible for all damages to the work under construction during its progress and until final completion and acceptance, even though partial payments have been made under the Contract.

1.6 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

- A. The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, fences, guardrails, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. The Contractor is required to comply with all provisions of General Laws Chapter 353, entitled "Excavations-Public Ways-Notice Requirements", otherwise known as DIGSAFE. Any damage resulting from the Contractor's operations shall be repaired by him/her at no additional cost to the Owner.
- B. Assistance will be given the Contractor in determining the location of existing services. The Contractor, however, shall bear full responsibility for obtaining all locations of underground structures and utilities (including, but not limited to existing water services, drain lines, sewers, and duct banks). Services to buildings shall be maintained, and all costs or charges resulting from damage thereto shall be paid by the Contractor.
- C. Protection and temporary removal and replacement of existing utilities and structures, as described in this Section, shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the unit prices established in the Contract.

D. If, in the opinion of the Engineer, permanent relocation of a utility owned by the Owner is required, which is not shown on the Plans or the Specifications, he may direct the Contractor, in writing, to perform the work. Work so ordered will be paid for as extra work under Articles of the General Conditions. If relocation of a privately-owned utility is required, the Owner will notify the utility to perform the work as expeditiously as possible. The Contractor shall fully cooperate with the Owner and utility, and shall have no claim for delay due to such relocation. The Contractor shall notify public utility companies, in writing, at least 72 hours (excluding Saturdays, Sundays, and legal holidays) before excavating in any public way. Also notify Massachusetts Dig Safe, telephone 811 at least 72 hours prior to start of work.

1.7 DISTRIBUTION SYSTEM AND SERVICES (NOT USED)

1.8 PIPE LOCATIONS

A. Pipelines shall be located substantially as indicated on the Drawings, but the Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him/her from laying and jointing different or additional items where required. Additional fittings ordered by the Owner or Engineer shall be paid for under the additional fittings bid item.

1.9 DIMENSIONS OF EXISTING STRUCTURES

A. Where the dimensions and locations of existing structures are of importance in the installation or connection of any part of the Work, the Contractor shall verify such dimensions and locations in the field before the fabrication of any material or equipment which is dependent on the correctness of such information.

1.10 OPEN EXCAVATIONS

- A. Contractor shall obtain proper trench permits as required by M.G.L C.82A and Title 520 of the CMR.
- B. All open excavations shall be adequately safeguarded by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons and damage to property. The Contractor shall, at his/her own expense, provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen or residents to their driveways. Bridges provided for access during construction shall be removed when no longer required.
- C. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer.
- D. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the

open trench, prohibiting stacking excavated material in the street and requiring that the trench shall not remain open overnight.

- E. All street excavations shall be completely closed at the end of each work day. Backfilling or use of (1") one inch steel plates of adequate strength to carry traffic shall be used. All street excavations within an intersection shall be temporarily patched over during any weekend period.
- F. The Contractor shall take precautions to prevent injury to the public due to open trenches. All trenches, excavated material, equipment, or other obstacles which could be dangerous to the public shall be well lighted at night.

1.11 TEST PITS/EXPLORATORY EXCAVATION

A. Test pits for the purpose of locating underground pipeline or structures in advance of the construction shall be excavated and backfilled by the Contractor at the direction and approval of the Engineer. Test pits shall be backfilled and compacted immediately after their purpose has been satisfied and the surface restored and maintained in a manner satisfactory to the Engineer.

1.12 MAINTENANCE OF TRAFFIC

- A. Access to all businesses shall be maintained. The Contractor shall provide an access plan to the Engineer and Owner prior to construction start. This includes but is not limited to locations of temporary traffic signage, police detail locations, and other traffic control devices to maintain traffic and access to abutting properties.
- B. Unless permission to close a street is received in writing from the proper authority, all excavated material shall be placed so that vehicular and pedestrian traffic may be maintained at all times. If the Contractor's operations cause traffic hazards, he/she shall repair the road surface, provide temporary ways, erect wheel guards or fences, or take other measures for safety satisfactory to the Engineer.
- C. Detours around construction will be subject to the approval of the Owner and Engineer. Where detours are permitted the Contractor shall provide all necessary barricades and signs as required to divert the flow of traffic. While traffic is detoured the Contractor shall expedite construction operations and periods when traffic is being detoured will be strictly controlled by the Owner.
- D. The Contractor shall take precautions to prevent injury to the public due to open trenches. Night watchmen may be required where special hazards exist, or police protection provided for traffic while work is in progress. The Contractor shall be fully responsible for damage or injuries whether or not police protection has been provided.
- E. When, in the opinion of the Police Department, public safety requires the services of police, the Safety Officer may direct the Contractor to provide manpower to direct traffic within the location of work under this Contract.

- F. The Contractor shall make all arrangements in obtaining the manpower and all invoices for policing. Police details shall be ordered at least 48-hours in advance of construction.
- G. The intent is to insure public safety by police direction of traffic. Police are not to serve as watchmen to protect the Contractor's equipment and materials, or to warn pedestrians of such hazards as open trenches.
- H. Nothing contained herein shall be construed as relieving the Contractor of any of his/her responsibilities for protection of persons and property under the terms of the Contract.
- I. Contractor shall furnish and maintain traffic control signage throughout the project and at all construction areas. Signs shall be standard signs in compliance with Massachusetts Highway standards. Signs shall be provided in accordance with the traffic management plans and specifications in the Contract Documents.
- J. It is the intent of this contract that traffic is maintained at all times in the areas of construction. The contractor may be required to halt operations and/or transport material to areas beyond immediate work locations in order to allow minimum traffic disruptions. Access to the site by emergency vehicles, school buses and residents shall be maintained at all times.
- K. The contractor shall be responsible for providing property owners with written notification of proposed construction which may require detours or road closures.
- L. Contractor shall not close or obstruct any portion of a street, road, or private way without obtaining permits therefore from the proper authorities. If any street, road or private way shall be rendered unsafe by the Contractor's operations, he shall make such repairs or provide such temporary ways or guards as shall be acceptable to the proper authorities.
- M. Streets, roads, private ways, and walks not closed shall be maintained passable and safe by the Contractor, who shall assume and have full responsibility for the adequacy and safety of provisions made therefore.
- N. The Contractor shall, at least 72 hours in advance, notify the Police, Fire and School Departments in writing, with a copy to the Engineer, if the closure of a street or road is necessary. He shall cooperate with the Police Department in the establishment of alternate routes and shall provide adequate detour signs, plainly marked and well lighted, in order to minimize confusion.
- О.

1.13 PROTECTION OF CONSTRUCTION AND EQUIPMENT

A. All newly-constructed work shall be carefully protected from injury in any way. No placing of heavy loads on it shall be allowed, and all portions injured shall be reconstructed by the Contractor at its own expense.

- B. All structures shall be protected in a manner approved by the Engineer. All such damaged portions of the work shall be completely repaired and made good by the Contractor, at his own expense, and to the satisfaction of the Engineer.
- C. If, in the final inspection of the work, any defects, faults, or omissions are found, the Contractor shall cause the same to be repaired or removed and replaced by proper materials and workmanship, without extra compensation for the materials and labor required. Further, the Contractor shall be fully responsible for the satisfactory maintenance and repair of the construction, and other work undertaken herein, for at least the guarantee period described in the Contract Documents.
- D. The Contractor shall take all necessary precautions to prevent damage to any work during and after construction, and until such work is accepted and taken over by the Owner.

1.14 CARE AND PROTECTION OF PROPERTY AND SURVEY MONUMENTS

- A. The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property, by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in another manner acceptable to the Engineer.
- B. Along the location of this work, all fences, walks, bushes, trees, shrubbery, and other physical features shall be protected and restored in a thoroughly workmanlike manner. Fences and other features removed by the Contractor shall be replaced in the location indicated on the Drawings as soon as conditions permit. All grass areas beyond the limits of construction, which have been damaged by the Contractor, shall be graded and seeded at the Contractor's expense.
- C. Trees close to the work shall be boxed or otherwise protected against injury. The Contractor shall trim all branches that are liable to damage because of his operations, but in no case shall any trees be cut or removed without prior notification of the Owner or other person in charge. All injuries to bark, trunk, limbs, and roots of trees shall be repaired by dressing, cutting, and painting according to approved methods using only approved tools and materials.
- D. The protection, removal, and replacement of existing physical features along the line of work shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the Bid Proposal. The Contractor is responsible for protecting and, if required, re-setting survey monuments (bounds). If a bound is in the way of required excavation, the Contractor will notify the Engineer/Inspector and/or the town Engineering Division with as much notice as possible prior to performing excavation near the bound.

1.15 REJECTED MATERIALS AND DEFECTIVE WORK

A. Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the Specifications shall forthwith be removed from the work by the Contractor, and shall not be made use of elsewhere in the work. Any errors, defects, or omissions in the execution of the work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor, and in a manner satisfactory to the Engineer. The Contractor shall reimburse the Owner for any expenses, losses, or damages incurred in consequence of any defect, error, omission, or act of the Contractor or his employees, as determined by the Engineer, occurring previous to the final payment.

1.16 COORDINATION WITH LOCAL AGENCIES

- A. The Contractor shall attend all meetings as specified in Section 01200.
- B. The Contractor will immediately notify the utility owner of any utility main breaks. In the case of water main emergencies, the emergency contact number for the North Andover Water and Sewer Department during business hours is 978-685-0950.
- C. The Contractor is prohibited overtime work unless an emergency exists. However, regularly scheduled overtime work is prohibited without (72) seventy-two hours prior notice and consent of the Engineer at which time the Contractor shall pay the cost of the Engineer at his or her overtime hourly wage rate.
- D. The Contractor shall notify the Owner at least 72 hours prior to any work so that the Owner can have an observer present if Work requires observing and monitoring. The 72 hour notification excludes holidays and weekends. In general, construction observation will be required:
 - 1. For Site Work:
 - a. When site clearing limits are established before tree cutting;
 - b. When rough grade is established,
 - c. While placing gravel/crushed stone leveling courses;
 - d. When final grade of base course is established;
 - e. During paving operations;
 - f. While laying out retaining wall;
 - g. During backfill operations;
 - h. When parking area and access driveway layout is established;
 - i. When boat ramp site layout is established;
 - j. During placement of rip rap slope stabilization;
 - k. Dredging, sediment testing, and disposal; and
 - 1. Installation and removal of dewatering controls.
 - 2. For Drainage, Water and Sewer Construction:
 - a. While laying pipe, but before backfilling;
 - b. During backfilling operations.

- c. During paving and/or gravel road surface operations.
- E. The Engineer will have the authority to reject any work or materials that do not constitute approval by the Owner and shall not relieve the Contractor of his obligations to perform the work in accordance with the Plans and Specifications.
- F. The Contractor shall maintain pavement as specified in Section 02576 and shall provide the Owner with contact information at which he/she can be contacted when he/she is not at the site. Upon notification by the Owner or the Engineer the Contractor shall promptly make repairs to the construction site as may be necessary.

1.16 WATER FOR CONSTRUCTION PURPOSES

- A. In locations where public water supply is available, the Contractor may be allowed to use water without charge for construction purposes. The express approval of the North Andover Water and Sewer Department shall be obtained before water is used. Waste of water by the Contractor shall be sufficient cause for withdrawing the privilege of unrestricted use. Hydrants shall not be operated by the contractor without the approval of the North Andover Water and Sewer Department. No hydrant shall be operated without proper backflow protection and required meters. Hydrants are only to be operated under the supervision of the Water Department personnel.
- B. The Contractor shall furnish all water required for and in connection with work to be done under this Contract including but not limited to: water for cleaning and testing all pipelines, manholes and structures; temporary potable water; sanitation and toilet facilities; disinfection.
- C. No separate measurement and payment shall be made for temporary water and all costs shall be incidental to and included with each applicable item.

1.17 MAINTENANCE OF FLOW

- A. The Contractor shall maintain the flow in sewers, drains and all watercourses, whether open channels or in pipes, in all other pipes interfered with in the line of work and convey the flow to a suitable point of discharge so as not to flow upon the work or create a nuisance. In the discharge of water removed from the excavations by pumping or by gravity similar precautions shall be observed.
- B. All existing drainage facilities including, but not limited to: brooks, streams, canals, channels, ditches, culverts, catch basins, and piping, shall be adequately safeguarded so as not to impede drainage or to cause siltation of downstream areas. If the Contractor damages or impairs through circumstances beyond his control, any of the aforesaid drainage facilities, he shall repair the same within the same day.
- C. At the conclusion of the work, the Contractor shall remove all silt in drainage structures caused by his operations, as specified in Section 01710 CLEANING UP.

1.18 COOPERATION WITHIN THIS CONTRACT

- A. All firms or persons authorized to perform any work under this Contract shall cooperate with General Contractor and his/her Subcontractors or trades and shall assist in incorporating the work of other trades where necessary or required.
- B. Cutting and patching, drilling and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or directed by the Engineer.

1.17 CLEANING AND PROTECTION

- A. During handling and installation, clean and protect construction in progress and adjoining materials in place. Install protective covering to ensure protection from damage or deterioration.
- B. Clean and maintain completed construction as frequently as necessary through the remainder of the construction period.
- C. Contractor shall be required to sweep public and private roadways to remove all materials related to project activities. The frequency of sweeping shall be based on the condition of the affected roadway.
- D. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:
 - i. Excessive static or dynamic loading.
 - ii. Excessive internal or external pressures.
 - iii. Excessively high or low temperatures.
 - iv. Air contamination or pollution.
 - v. Water or ice.
 - vi. Solvents.
 - vii. Chemicals.
 - viii. Heavy traffic.
 - ix. Misalignment.
 - x. Unprotected storage.
 - xi. Improper shipping or handling.
 - xii. Theft.
 - xiii. Vandalism.

1.19 CLEANUP AND DISPOSAL OF EXCESS MATERIAL

A. During the course of the work, the Contractor shall keep the site of his/her operations in as clean and neat a condition as is possible. He/She shall dispose of all residues resulting from the construction work and, at the conclusion of the work, he/she shall remove and haul away any surplus excavation, broken pavement, lumber, equipment, temporary structures and any other refuse remaining from the construction operations and shall leave the entire site of the work in a neat and orderly condition.

- B. In order to prevent environmental pollution arising from the construction activities related to the performance of this Contract, the Contractor and his/her subcontractors shall comply with all applicable Federal, State and local laws and regulations concerning waste material disposal, as well as the specific requirements stated in this Section and elsewhere in the Specifications.
- C. The Contractor is advised that the disposal of excess excavated material in wetlands, stream corridors and plains is strictly prohibited even if the permission of the property owner is obtained. Any violation of this restriction by the Contractor or any person employed by him, will be brought to the immediate attention of the responsible regulatory agencies, with a request that appropriate action be taken against the offending parties. Therefore, the Contractor will be required to remove the fill at his/her own expense and restore the area impacted.
- D. Outdoor burning of rubbish and waste material on the site will not be permitted.
- E. Disposal of volatile fluid wastes (such as mineral spirits, oil, gasoline, or paint thinner) in storm or sanitary sewer systems or into streams or waterways is not permitted.
- F. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

1.20 DUST CONTROL

- A. During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of water as necessary, so as to minimize the creation and dispersion of dust. If the Engineer decides that it is necessary to use calcium chloride, and it is allowed by local authorities, for more effective dust control, the Contractor shall furnish and apply the material as directed.
- B. Calcium chloride shall be commercial grade, furnished in 100 lb, 5-ply bags, stored under weatherproof cover and stacked alternately for ventilation. Application for dust control shall be at the rate of about 1/2 pound per square yard, unless otherwise directed by the Engineer.
- C. Within buildings, the Contractor shall provide suitable materials and methods of dust control, containment, and clean up during construction. Methods, materials, and schedule shall be approved by the Engineer.

1.21 SCHEDULE OF WORK (CONTINUOUS)

A. The Contractor shall schedule all work to be continuously performed once the major tasks are begun. There shall be no breaks in the work schedule. Work by subcontractors shall be scheduled to maintain continuous work.

1.22 PRECAUTIONS DURING ADVERSE WEATHER

- A. During adverse weather and against the possibility thereof, the Contractor shall take all necessary precautions so that the Work may be properly done and satisfactory in all respects. When required, protection shall be provided by use of tarpaulins, wood and building-paper shelters, or other suitable means.
- B. During cold weather, materials shall be preheated, if required, and the materials and adjacent structure into which they are to be incorporated shall be made and kept sufficiently warm so that a proper bond will take place and a proper curing, aging, or drying will result. Protected spaces shall be artificially heated by suitable means which will result in a moist or a dry atmosphere according to the particular requirements of the work being protected. Ingredients for concrete and mortar shall be sufficiently heated so that the mixture will be warm throughout when used.

END OF SECTION 01046

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SECTION 01050

FIELD ENGINEERING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions, Division 0 and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY OF WORK

- A. The work covered under this Section of the Specifications includes the following:
 - 1. Examination of site and conditions of construction.
 - 2. Establishment of lines, grades, and easements.
 - 3. Connections to existing facilities.
 - 4. Restoration and protection of public and private property.

1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 Submittal Procedures:
 - 1. A post construction topographic survey shall be provided by the Contractor and shall be stamped by a Professional Land Surveyor (PLS).
 - i. Topographic Survey: After completion of the North Lake Cochichewick Boat Launch construction activities at the Project Site, a topographic survey shall be conducted by an PLS and a record drawing shall be prepared signed and sealed by the PLS, which includes the following information:
 - (a) Locating the construction control points, including establishing and maintaining permanent bench marks.
 - (b) Location of all property lines within 200 feet of the work area.
 - (c) The topographic survey work shall extend to the limit of work shown on Sheet C-6 of the Contract Drawings and includes, but is not limited to North Lake Cochichewick Boat Launch, site pavement, retaining walls, bioretention areas, stormwater controls, and all new utilities. Provide topographic survey with 1-ft contours and spot elevations.
 - (d) Location of all permanent utilities, fencing, gravity retaining walls, buildings, edge of pavement, and drainage structures within the work area.
 - (e) The invert elevations of all drainage structures and gravity pipe inlets and outlets.

- (f) The information obtained from this survey shall be professionally drafted on 22" x 34" sheets, using a scale of 1"=20' and shall be based on the vertical and horizontal datum as shown on the Contract Drawings.
- ii. The Contractor shall submit the record drawing in hard copy form as specified above, and as an AutoCAD drawing file, meeting the Town of North Andover's AutoCAD specifications (version 2018 Civil 3D compatible, or more recent). A PDF version of the hard copy shall also be provided.

1.4 PROJECT/SITE CONDITIONS

- A. Environmental Requirements:
 - 1. Unfavorable Construction Conditions:
 - i. During unfavorable weather, wet grounds, or other unsuitable construction conditions, confine operations to work which will not be affected adversely by such conditions.
 - ii. No portion of Work shall be constructed under conditions which adversely affect quality or efficiency thereof, unless special means or precautions are taken to perform Work in manner acceptable to the Engineer.
- B. Field Measurements:
 - 1. Lines and Grades:
 - i. All Work shall be done to lines, grades, and elevations indicated on drawings or specified herein.
 - ii. Elevations on the construction plans are in the NAVD 1988 vertical datum and any plans required by this section are to be done in the NAVD 1988 vertical datum. Contractor shall be responsible for maintaining or subsequently replacing these controls to the satisfaction of the Engineer if these controls are disturbed. The Contractor shall be responsible for verifying all vertical control information that is used.
 - (a) Points shall be used as datum for work.
 - (b) Contractor shall be responsible for transferring all lines and grades from basic survey control points.
 - iii. Contractor to perform all additional survey, layout, and measurement work.
 - (a) The Contractor shall provide survey work by a firm having successfully completed at least two projects of similar size and complexity within the last five years, and who shall employ experienced personnel and provide adequate supervision to satisfaction of the Engineer at all times when operations are in progress.
 - (b) Surveyor shall be a professional land surveyor (PLS) in the State of Massachusetts.
 - iv. Keep the Engineer informed, in writing, two weeks in advance, of times and places at which work is to be performed, so that horizontal and vertical control

points may be established and any checking deemed necessary by the Engineer may be performed.

- v. Remove and reconstruct Work which is improperly located as determined by the Engineer and at no additional cost to the Owner.
- 2. Easements and Rights-of-Way:
 - i. Easements and rights-of-way for utilities, if required, will be provided by the Owner.
 - ii. Confine construction operations within limits indicated on drawings and/or within limits of easements or public ways.
 - iii. Place construction tools, equipment, excavated materials, and pipeline materials and supplies, so as to cause least possible damage to property and interference with traffic.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use new materials in restoration of existing facilities except where soil materials and plants may be reused as appropriate, and as approved by the Engineer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examination of Site and Verification of Conditions:
 - 1. Before starting operations, examine site to become acquainted with conditions to be encountered.
 - 2. Verify exact locations of sewers, water mains, gas mains, above or below ground electrical wires, other utilities, conduits and structures which may interfere with work.
 - 3. Verify and stake-out exact locations of the proposed work.

3.2 APPLICATION

- A. Site Layout: Prior to any construction activities at the site, the Contractor shall establish control points and coordinate this work with the Engineer. The Contractor shall use the information on the Drawings, where available, and shall supplement this with any necessary file searches to provide the necessary information to perform a complete line survey around the entire limits of the work area. The Contractor shall also establish permanent vertical benchmarks within the limit of work in locations approved by the Engineer.
- B. Connections to Existing Facilities:

- 1. Make connections to existing facilities as indicated on drawings or as specified.
- 2. Obtain permission from specific utility owners in writing prior to undertaking connections.
 - i. Protect facilities against deleterious substances and damage.
- 3. Plan in advance all connections to existing facilities which are in service.
 - i. All equipment, materials, and labor shall be on hand at time of undertaking connections to existing facilities in service.
 - ii. Work shall proceed continuously if necessary to complete connections within the time designated by the Engineer.
 - iii. Existing water systems to be connected to shall not be taken out of service during periods of high demand; coordinate any disruptions to service with the Owner.
- C. Restoration and Protection of Public and Private Property:
 - 1. Protect, shore, brace, support, and maintain all underground pipes, conduits, drains, and other underground construction uncovered or otherwise affected by construction operations.
 - 2. Restore all public and private property including pavement, surfacing, curbs, walks, utility poles, guy wires, fences, and other surface structures affected by construction operations, together with all loam and seed and landscaping to their original condition or better, whether within or outside easements.

3.3 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700 – Contract Closeout

END OF SECTION 01050

SECTION 01063

MISCELLANEOUS REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

A. The Contractor shall conform to all miscellaneous requirements as herein specified.

1.3 COOPERATION WITH CONCURRENT WORKS

A. The Contractor shall at all times conduct his operations so as not to interfere with concurrent works. The Contractor shall develop a program, in cooperation with the Engineer, Owner, and other Contractor(s) which will allow for construction in the most orderly manner possible. This program shall be adhered to except as deviations therefrom are expressly permitted. Before starting work which will interfere with the operation of others, the Contractor shall communicate with the other Contractor, do all possible preparatory work, and shall see that all tools, materials, and equipment are made ready and at hand. The Contractor shall make such minor modifications in the work relating to concurrent work as may be necessary, without additional compensation.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01063

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SECTION 01095

REFERENCE STANDARDS AND DEFINITIONS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1, Specification Sections, apply to this Section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. Indicated: The term indicated refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as shown, noted, scheduled, and specified are used to help the reader locate the reference. There is no limitation on location.
- C. Directed: Terms such as directed, requested, authorized, selected, approved, required, and permitted mean directed by the Engineer, requested by the Engineer, and similar phrases.
- D. Approve: The term approved, when used in conjunction with the Engineer's action on the Contractor's submittals, applications, and requests, is limited to the Engineer's duties and responsibilities as stated in the Conditions of the Contract.
- E. Regulation: The term regulations includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the work.
- F. Furnish: The term furnish means supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. Install: The term install describes operations at the project site, including the actual unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. Replace: The term replace means dismantle, remove, and dispose of existing equipment and materials and furnish and install new specified item.
- I Provide: The term provide means to furnish and install, complete and ready for the intended use.

- 1. The term experienced, when used with the term Installer, means having a minimum of five previous projects similar in size and scope to this project, being familiar with the special requirements indicated, and having complied with requirements of the authority having jurisdiction.
- 2. Trades: Using terms such as carpentry is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such a carpenter. It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
- J Project Site is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of the project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the project is to be built.
- K Testing Agencies: A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with the standards in effect as of the date of the Contract Documents.
- C. Conflicting Requirements: Where compliance with two or more standards is specified, and where the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different, but apparently equal, and uncertainties to the Engineer for a decision before proceeding.
 - 1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Engineer for a decision before proceeding.

- D. Copies of Standards: Each entity engaged in construction on the project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.
- E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in Contract Documents, are defined to mean the associated names. Names and addresses are subject to change and are believed, but not assured, to be accurate and up-to-date as of date of Contract Documents.
- American Concrete Institute ACI P.O. Box 19150 Detroit, Michigan 48219-0150 Telephone: (313) 532-2600 Al Asphalt Institute **Research Park Drive** P.O. Box 14052 Lexington, Kentucky 40512-4052 Telephone: (606) 288-4960 ANSI American National Standards Institute 11 West 42nd Street 13th Floor New York, New York 10036 Telephone: (212) 642-3300 ASTM American Society for Testing and Materials 1916 Race Street Philadelphia, Pennsylvania 19103 Telephone: (215) 299-5400 AWWA American Water Works Association 6666 West Quincy Avenue Denver, Colorado 80235 Telephone: (303) 794-7711 MSS Manufacturers Standardization Society of The Valve and Fittings Industry 127 Park Street, N.E. Vienna, Virginia 22180 Telephone: (703) 281-6613 NAPA National Asphalt Pavement Association

North Andover, MA

6811 Kenilworth Avenue Calvert Building Suite 620 Riverdale, Maryland 20737 Telephone: (301) 779-4880

- NFPA National Fire Protection Association One Batterymarch Park Quincy, MA 02169 Telephone: (617)- 770-3000
- WSC Water Systems Council 600 South Federal Street Suite 400 Chicago, Illinois 60605 Telephone: (312) 922-6222
- F. Federal Government Agencies: Names and titles of Federal Government standardor specification-producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standardor specification-producing agencies of the Federal Government. Names and addresses are subject to change and are believed, but not assured, to be accurate and up-to-date as of the date of the Contract Documents.

CFR	Code of Federal Regulations (available from the Government Printing Office) North Capitol Street between G and H Streets, N.W. Washington, D.C. 20402 Telephone: (202) 783-3238
EPA	(Material is usually first published in the "Federal Register) Environmental Protection Agency 401 M Street, S.W. Washington, D.C. 20460 Telephone: (202) 382-2090
NIST	National Institute of Standards and Technology (U.S. Department of Commerce) Gaithersburg, Maryland 20899 Telephone: (301) 975-2000
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor) Government Printing Office Washington, D.C. 20402 Telephone: (202) 523-6091

1.4 GOVERNING REGULATIONS AND AUTHORITIES

A. The Engineer has contacted authorities having jurisdiction where necessary to obtain information to prepare Contract Documents. Contact authorities having jurisdiction directly for information and decisions regarding the work.

North Andover Department of Public Works Telephone: 978-685-0950

North Andover Water & Sewer Department Telephone: 978-685-0950

1.5 SUBMITTALS

A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, warranties, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01095

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SECTION 01110

ENVIRONMENTAL PROTECTION MEASURES

PART 1 - GENERAL

1.1 SUMMARY

- A. The work covered by this section consists of furnishing all labor, materials and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purpose of this Specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environmental for aesthetic and/or recreational purposes.
- B. The control of environmental pollution requires consideration of air, water, and land, and involves management of noise and solid waste, as well as other pollutants.
- C. The Contractor shall take sufficient precautions during construction to minimize the run-off of polluting substances such as silt, clay, fuels, oils, bitumen and calcium chloride into the supplies and surface waters of the State.
- D. Schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Provide erosion control measures such as diversion channels, sedimentation or filtration systems, berms, staked hay bales, seeding, mulching or other special surface treatments as are required to prevent silting and muddying of streams, rivers, impoundments, lakes, etc. All erosion control measures shall be in place in an area prior to any construction activity in that area.
- E. These Specifications are intended to ensure that construction is achieved with minimal disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.
- F. Schedule and conduct all work in a manner that will minimize the level of noise escaping the site, especially at night and on weekends.
- G. Contractor shall be responsible for maintenance of the erosion control structures and devices, and replacing as needed to maintain the required protection and performance.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this

section.

- B. Related sections include the following:
 - 1. Section 02020 Erosion and Sediment Control

1.3 APPLICABLE REGULATIONS

A. Comply with all applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement.

1.4 NOTIFICATIONS

A. The Engineer will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectionable acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the Contractor in writing, through the Engineer, of any non-compliance with State or local requirements. The Contractor shall, after receipt of such notice from the Engineer or from the regulatory agency through the Engineer, immediately take corrective action. Such notice, when delivered to the Contractor or his/her authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

1.5 IMPLEMENTATION

- A. Prior to commencement of the work, meet with the Engineer to develop mutual understandings relative to compliance with this provision and administration of the environmental pollution control program.
- B. Remove temporary environmental control features, when approved by the Engineer, and incorporate permanent control features into the project at the earliest practicable time.

PART 2 – PRODUCTS

PART 3 – EXECUTION

3.1 PROTECTION OF WETLANDS RESOURCE AREAS

A. Care shall be taken to prevent or reduce to a minimum any disturbance to the adjacent wetlands, drainage ditch, surface water body, storm drain or sewer from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or

materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the receiving body shall not be directly returned to the surface water body. Such water will be diverted through a settling basin or filter before being directed into the surface water body.

- B. The Contractor shall not discharge water from dewatering operations directly into a wetland, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels. All dewatering discharges shall also include energy dissipation to prevent scouring.
- C. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan approved by the Massachusetts Department of Environmental Protection. Contractor shall submit two copies (2) of approved Contingency Drawings or plans to the Engineer.
- D. Equipment refueling operations must take place in a supervised area with appropriate secondary containment measures in place and spill response materials accessible on-site for the duration of construction.

3.2 PROVISIONS FOR CONTROL OF EROSION

- A. Special precautions shall be taken in the use of construction equipment to prevent operations which promote erosion. Erosion control measures, such as siltation basins, hay check dams, mulching, jute netting and other equivalent techniques, shall be used as appropriate. Flow of surface water into excavated areas shall be prevented.
- B. Disposal of drainage shall be in an area approved by the Owner. The Contractor shall prevent the flow or seepage of drainage back into the drainage area. Drainage shall not be disposed of until silt and other sedimentary materials have been removed. Particular care shall be taken to prevent the discharge of unsuitable drainage to a water supply or surface water body.
- C. As a minimum, the following shall apply:
 - 1. Silt fence shall be provided at points where drainage from the work site may contain polluting substances. The point of control shall be within the limits of the new construction and shall be contained in such a way as to not allow sediment to pass. Other methods which reduce the sediment content to an equal or greater degree may be used as approved by the Engineer.
 - 2. Drainage leaving the site shall flow to water courses in such a manner to prevent erosion.

D. Measures for control of erosion must be adequate to assure that turbidity in the receiving water will not be increased more than 10 standard turbidity units (s.t.u.), or as otherwise required by the State or other controlling body, in waters used for public water supply or fish unless limits have been established for the particular water. In surface water used for other purposes, the turbidity must not exceed 25 s.t.u. unless otherwise permitted.

3.3 PROTECTION OF STREAMS

- A. Care shall be taken to prevent, or reduce to a minimum, any damage to any stream from pollution by debris, sediment or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such waters will be diverted through a settling basin or filter before being directed into the streams.
- B. The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.
- C. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action plan approved by the Massachusetts Department of Environmental Protection.

3.4 PROTECTION OF LAND RESOURCES

- A. Land resources within the project boundaries and outside the limits of permanent work shall be restored to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to areas shown on the Drawings.
- B. Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.
- C. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.

- D. Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition. The Engineer will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and disposed of.
- E. All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 1-in in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.
- F. Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed and replaced.
- G. The locations of the Contractor's storage, and other construction buildings, required temporarily in the performance of the work, shall be cleared portions of the job site or areas to be cleared as shown on the Drawings and shall require written approval of the Engineer and shall not be within wetlands or floodplains. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for approval of the Engineer.
- H. If the Contractor proposes to construct temporary roads or embankments and excavations for plant and/or work areas, he/she shall submit the following for approval at least ten days prior to scheduled start of such temporary work.
 - 1. A layout of all temporary roads, excavations and embankments to be constructed within the work area.
 - 2. Details of temporary road construction.
 - 3. Drawings and cross sections of proposed embankments and their foundations, including a description of proposed materials.
 - 4. A landscaping drawing showing the proposed restoration of the area. Removal of any trees and shrubs outside the limits of existing clearing area shall be indicated. The drawing shall also indicate location of required guard posts or barriers required to control vehicular traffic passing close to trees and shrubs to be maintained undamaged. The drawing shall provide for the obliteration of construction scars as such and shall provide for a natural appearing final condition of the area. Modification of the Contractor's approved drawings shall be made only with the written approval of the Engineer. No unauthorized road construction, excavation or embankment construction including disposal areas will be permitted.

- I. Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and seeded as approved by the Engineer.
- J. All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.

3.5 PROTECTION OF AIR QUALITY

- A. Burning. The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- B. Dust Control. The Contractor will be required to maintain all excavations, embankment, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from dust which could cause the standards for air pollution to be exceeded, and which would cause a hazard or nuisance to others.
- C. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of petroleum products is prohibited. The use of chlorides may be permitted with approval from the Engineer.
- D. Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.

3.6 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

A. During the life of this Contract, maintain all facilities constructed for pollution control as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

3.7 NOISE CONTROL

- A. The Contractor shall make every effort to minimize noises caused by his/her operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with State and Federal regulations.
- B. Contractor should note local residences within proximately of the work and shall make all efforts to minimize noise disruptions.

END OF SECTION 01110

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SPECIAL PROVISIONS

PART 1 – GENERAL

1.1 GENERAL OBLIGATIONS OF THE CONTRACTOR

A. General obligations of the Contractor shall be as set forth in the Contract Documents. Unless special payment is specifically provided in the payment paragraphs of the specifications, all incidental work and expense in connection with the completion of work under the Contract will be considered a subsidiary obligation of the Contractor and all such costs shall be included in the appropriate items in the Bid Form in connection with which the costs are incurred.

1.2 SITE INVESTIGATION

A. The Contractor shall satisfy himself/herself as to the conditions existing within the project area, the type of equipment required to perform the work, the character, quality and quantity of the subsurface materials to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, as well as from information presented by the Drawings and Specifications. Any failure of the Contractor to acquaint himself/herself with the available information will not relieve him/her from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusions or interpretation made by the Contractor on the basis of the information made available by the Owner.

1.3 CONTRACTOR'S EMERGENCY CONTACT AND RESPONSE REQUIREMENT

- A. The Contractor will be required to designate a contact person as well as an emergency response crew who can be notified by the Owner and the Engineer during Contract related emergencies, 7 days a week, 24 hours a day throughout the length of this Contract.
- B. The name of the designated person, a daytime contact telephone number, an evening contact telephone number, and a portable cellular telephone number must be furnished to the Owner at the pre-construction meeting. The Contractor must also provide a mobile cellular telephone that will remain at the construction site during the hours of construction. The phone will be in a location that will allow the Contractor to respond to calls as well as the Owner or Engineer.
- C. The contact person shall be required to respond to any North Andover Department of Public Works notification in this regard within one hour of such notice by calling 978-685-0950. Upon being advised by the Department of Public Works of the location and nature of the emergency, the Contractor will be required to provide an emergency coordinator or contact at the site within one hour of the initial notification and to mobilize the necessary response crew(s) and have them at the site of the emergency within two hours of the initial notification.

- D. The Contractor's failure to comply with the above notification and response requirements shall result in a **one thousand dollar (\$1,000.00) fine** for each failure to respond as indicted in 1.3.C. In addition the Contractor shall be liable for any and all damages, liabilities and costs which result from his/her failure to respond to any emergency within the designated time periods. The Owner assumes no responsibility or costs for the Contractor's negligence in complying with these requirements. If the subject fine or other liabilities are not paid by the Contractor upon request, it shall be deducted from any payment(s) which may be due the Contractor by the Owner, solely at the discretion of the Owner.
- E. The Contractor shall not use any Owner personnel to fulfill these requirements.
- F. This requirement shall be considered an incidental part of the Contract, no matter how many times the Contractor is alerted during this Contract, and no payment will be made for any costs incurred or associated with the emergency contact and response requirements.

1.4 PUBLIC UTILITIES

- A. The Contractor shall comply with the requirements of the Commonwealth of Massachusetts Statute Chapter 82, Section 40, for excavations in public and private property. Compliance shall include the following:
 - 1. The Contractor shall notify public utility companies in writing at least 72 hours (excluding Saturdays, Sundays and legal holidays) but not more than 30 days before excavating in areas where underground utility plant (pipes, cables, manholes, etc) exist.
 - 2. The Contractor shall be responsible for providing the Utility Companies with a schedule of his/her activities in areas where the utilities exist.
 - 3. The Contractor shall immediately notify utility companies of any damage to their utilities resulting from construction operations.
 - 4. The express approval of the Owner shall be obtained before public water is used (when available). Hydrants shall only be operated under the supervision of the North Andover Water & Sewer Department personnel. The water is to be metered. A meter must be attained by the North Andover Water & Sewer Department. The Contractor will be responsible for all associated fees and charges for water use.
- B. The Contractor shall notify DIGSAFE at 811 at least 72 hours before digging, trenching, blasting, demolishing, boring, backfilling, grading, landscaping or other earth moving operations in any public ways, rights of way and easements.

1.5 PERMITS

- A. The Contractor shall be required to obtain all necessary permits for proper execution of certain phases of the project. The Contractor shall fill out all forms and furnish all drawings required to obtain the permits. A copy of the approved permit shall be submitted to the Engineer. All fees associated with these permits shall be paid by the Contractor as part of the project. Work shall not commence on any phase of the work requiring a permit until the permit is obtained.
- B. The Contractor shall obtain the required street opening and trench opening permits from the Town for excavations within the street or sidewalk area. There is a permit fee for each trench opening. The permit fees shall be at the expense of the Contractor.

1.6 TRAFFIC AT STREET INTERSECTIONS

- A. The Contractor shall minimize interferences with the normal flow of traffic. The Contractor shall take all actions ordered by the Engineer to minimize the disruption of normal traffic flow.
- B. No equipment, trucks, traffic control devices, or anything that restricts the flow of traffic through the construction zone shall occupy any part of the travelled way except between the hours of work noted in the Control of Work Specification Section 01046.
- C. The Contractor shall note the proximity of the project to local residential areas and all efforts shall be taken to minimize traffic disruptions.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

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PROJECT MEETINGS

PART 1 – GENERAL

1.1 COORDINATION WITH THE OWNER

A. As part of this Contract, the Contractor shall coordinate his activities with the Owner. In addition, the Contractor will give the Owner significant notice on any Work that may be required to meet the Contract schedule.

1.2 CONSTRUCTION KICK-OFF MEETING

- A. Refer to Paragraph 2.03.C of the Standard General Conditions for information on the kick-off meeting.
- B. Contractor will be notified of the time, date and place where the kick-off conference will be held.

1.3 PRECONSTRUCTION CONFERENCE

- A. A pre-construction conference will be held between the Contractor, the Engineer, the Owner, and applicable agency representatives to review, in detail, the Contractor's proposed methods of complying with the requirements of the Contract Documents.
- B. Contractor will be notified of the time, date and place where the pre-construction conference will be held.

1.4 PROGRESS MEETINGS WITH ENGINEER

In addition to other regular project meetings for other purposes (as indicated elsewhere A. in the Contract Documents), hold general progress meetings weekly with times coordinated with preparation of payment requests. Meeting dates shall be established by the Engineer. Require every entity then involved in the planning, coordination or performance of Work to be properly represented at each meeting. Include (when applicable) consultants, separate Contractors (if any), principal subcontractors, suppliers/ manufacturers/fabricators, governing authorities, insurers, special supervisory personnel and others with an interest or expertise in the progress of the Work. Review each entity's present and future needs including interface requirements, time, sequence, deliveries, access, Site utilization, temporary facilities and services, hours of Work, hazards and risks, housekeeping, submittals, change orders, and documentation of information for payment requests. Discuss whether each element of current Work is ahead of schedule. Determine how behind-time Work will be expedited and secure commitments from the entities involved in doing so. Discuss whether schedule revisions are required to ensure that current Work and subsequent Work will be completed within the Contract Time. Review everything of significance which could affect the progress of the Work.

B. Immediately following each progress meeting where revisions to the Progress Schedule/Critical Path Schedule have been made or recognized (regardless of whether agreed to by each entity represented), revise the Schedule. Reissue revised Schedule within 10 days after meeting. At intervals matching the preparation of payment requests, revise and reissue the Schedule to show actual progress of the Work in relation to the latest revision of the Schedule.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

SUBMITTALS

PART 1 – GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

- A. This Section specifies the general methods and requirements of submissions applicable to the following work-related submittals: Shop Drawings, Product Data, Samples, Construction Photographs, and Construction Schedules. Additional general submission requirements are contained in Paragraph 6 of the General Conditions. Detailed submittal requirements will be specified in the technical specifications sections.
- B. All submittals shall be clearly identified by reference to Specification Section, Paragraph, Drawing No. or Detail as applicable. Submittals shall be clear and legible and of sufficient size for sufficient presentation of data.

1.2 SHOP DRAWINGS, PRODUCT DATA, SAMPLES

- A. Shop Drawings
 - 1. Shop drawings, as defined in the General Conditions, and as specified in individual work Sections include, but are not necessarily limited to, customprepared data such as fabrication and erection/installation (working) drawings, scheduled information, setting diagrams, actual shopwork manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certifications, as applicable to the Work.
 - 2. All shop drawings submitted by subcontractors for approval shall be sent directly to the Contractor for checking. The Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.
 - 3. The Contractor shall check all subcontractors' shop drawings regarding measurements, size of members, materials, and details to satisfy himself that they conform to the intent of the Drawings and Specifications. Shop drawings found to be inaccurate or otherwise in error shall be returned to the subcontractors for correction before submission thereof.
 - 4. All details on shop drawings submitted for approval shall show clearly the relation of the various parts to the main members and lines of the structure, and where correct fabrication of the work depends upon field measurements; such measurements shall be made and noted on the drawings before being submitted for approval.

- 5. Submittals for equipment specified under Division 2 shall include a listing of all installations where identical or similar equipment has been installed and been in operation for a period of at least one year.
- 6. A certification statement is required certifying the products in accordance with the American Iron and Steel Act.
- B. Product Data
 - 1. Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliance's and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the Work.
 - 2. A certification statement is required certifying the products in accordance with the American Iron and Steel Act.
- C. Samples
 - 1. Samples specified in individual Sections, include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the Work.

1.3 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall review shop drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:
 - 1. Field measurements
 - 2. Field construction criteria
 - 3. Catalog numbers and similar data
 - 4. Conformance with the Specifications

- B. Each shop drawing, sample and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor: "Certification Statement: by this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements." Shop drawings and product data sheets 11-in x 17-in and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the Resident Project Representative a copy of each submittal transmittal sheet for shop drawings, product data and samples at the time of submittal of said drawings, product data and samples to the Engineer.
- C. The review and approval of shop drawings, samples or product data by the Engineer shall not relieve the Contractor from his/her responsibility with regard to the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor and the Engineer will have no responsibility therefor.
- D. No portion of the work requiring a shop drawing, sample, or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the Contractor's risk. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.
- E. Project work, materials, fabrication, and installation shall conform to approved shop drawings, applicable samples, and product data.

1.4 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the Work or in the work of any other contractor.
- B. Each submittal, appropriately coded, will be returned within 30 working days following receipt of submittal by the Engineer.
- C. Number of submittals required:
 - 1. Shop Drawings as defined in Paragraph 1.2 A: Five copies.
 - 2. Product Data as defined in Paragraph 1.2 B: Three copies.
 - 3. Samples: Submit the number stated in the respective Specification Sections.
- D. Submittals shall contain:
 - 1. The date of submission and the dates of any previous submissions.

- 2. The Project title and number.
- 3. Contractor identification.
- 4. The names of:
 - a. Contractor
 - b. Supplier
 - c. Manufacturer
- 5. Identification of the product, with the specification section number, page and paragraph(s).
- 6. Field dimensions, clearly identified as such.
- 7. Relation to adjacent or critical features of the Work or materials.
- 8. Applicable standards, such as ASTM or Federal Specification numbers.
- 9. Identification of deviations from Contract Documents.
- 10. Identification of revisions on resubmittals.
- 11. An 8-in x 3-in blank space for Contractor and Engineer stamps.

1.5 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES

- A. The review of shop drawings, data, and samples will be for general conformance with the design concept and Contract Documents. They shall not be construed:
 - 1. as permitting any departure from the Contract requirements;
 - 2. as relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
 - 3. as approving departures from details furnished by the Engineer, except as otherwise provided herein.
- B. The Contractor remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.

- C. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Engineer may return the reviewed drawings without noting an exception.
- D. Submittals will be returned to the Contractor under one of the following codes.
- Code 1 "NO EXCEPTION TAKEN" is assigned when there are no notations or comments on the submittal. When returned under this code the Contractor may release the equipment and/or material for manufacture.
- Code 2 "MAKE CORRECTIONS AS NOTED". This code is assigned when a confirmation of the notations and comments IS NOT required by the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.
- Code 3 "SUBMIT SPECIFIED ITEM". This combination of codes is assigned when a confirmation of the notations and comments IS required by the Contractor. This confirmation shall specifically address each omission and nonconforming item that was noted. Confirmation is to be received by the Engineer within 10 calendar days of the date of the Engineer's transmittal requiring the confirmation.
- Code 4 "REVISE AND RESUBMIT". This combination of codes is assigned when notations and comments are extensive enough to require a resubmittal of the package. This resubmittal is to address all comments, omissions and non-conforming items that were noted. Resubmittal is to be received by the Engineer within 10 calendar days of the date of the Engineer's transmittal requiring the resubmittal.
- Code 5 "REJECTED" is assigned when the submittal does not meet the intent of the Contract Documents. The Contractor must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents.

- E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing on the letter of transmittal and on resubmitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the Engineer, on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the Contractor. The Contractor shall make corrections to any work done because of this type revision that is not in accordance to the Contract Documents as may be required by the Engineer.
- F. Partial submittals may not be reviewed. The Engineer will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor, and will be considered "Rejected" until resubmitted. The Engineer may, at his/her option, provide a list or mark the submittal directing the Contractor to the areas that are incomplete.
- G. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the Engineer at least seven working days prior to release for manufacture.
- H. When the shop drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

1.6 DISTRIBUTION

A. Distribute reproductions of approved shop drawings and copies of approved product data and samples, where required, to the job site file and elsewhere as directed by the Engineer. Number of copies shall be as directed by the Engineer but shall not exceed 6.

1.7 AS-BUILTS

- A. Maintain on site one set of the following as-builts; record actual revisions to the Work:
 - 1. Drawings
 - 2. Specifications
 - 3. Addenda
 - 4. Change orders and other modifications to the Contract
 - 5. Reviewed shop drawings, Product Data, and Samples
 - 6. Manufacturer's instruction for assembly, installation, and adjusting

- B. Record information concurrent with construction progress, not less than weekly. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates used.
 - 3. Changes made by Addenda and modifications.
- E. As-Builts and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured horizontal and vertical locations of underground utilities and appurtenances, including fire hydrants, gate valves, and service boxes, referenced to permanent surface structures.
 - 2. Field changes of dimension and detail.
 - 3. Details not on original Contract drawings.

1.8 SCHEDULES

- A. Provide all schedules required by the General Conditions.
- B. The Contractor shall submit a progress schedule before starting any work, in accordance with the General Conditions. The Contractor shall review the progress schedule with the Engineer periodically. Such review shall be made on a monthly basis or more frequently as required by the Engineer. The progress schedule shall be updated as required by the Engineer.

1.9 "OR EQUAL"

- A. Should the Contractor seek approval of a product other than the brand or brands named in these specifications, it shall furnish written evidence that such product conforms in all respects to the specified requirements, and that it has been used successfully elsewhere under similar conditions. Where the specified requirements involve conformance to recognized codes or standards the Contractor shall furnish evidence of such conformance in the form of test or inspection reports, prepared by a recognized agency, and baring an authorized signature.
- B. Manufacturers' standard data and catalog cut sheets will not be considered sufficient in themselves, and the Engineer will not be responsible for seeking further data from

the manufacturer, or for otherwise researching the product. Failure to provide complete data will be cause for rejection of the product.

C. The Contractor shall be responsible for all additional costs including license fees, foundation, piping and electrical work necessary to accommodate the proposed "or equal" equipment. Items which result in a cost reduction shall be presented and a change order reflecting 65% of the cost savings will be prepared and the contract price modified.

1.10 PROFESSIONAL ENGINEER (P.E.) CERTIFICATION FORM

A. If specifically required in other Sections of these Specifications, the Contractor shall submit a P.E. Certification for each item required, in the form attached to this Section, completely filled in and stamped.

1.11 GENERAL PROCEDURES FOR SUBMITTALS

A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work sections, of the Specifications, so that the installation will not be delayed by processing times including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a Professional Engineer registered in the Commonwealth of Massachusetts and that he/she has been employed by (Name of Contractor) to design in accordance with for the project. The undersigned further certifies that Specification Section design he/she has performed the of the _, that said design is in conformance with all applicable local, state and federal codes, rules, and regulations, and that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the Owner or the Owner's representative with seven days following written request therefor by the Owner.

P.E. Name

License Number / State

Signature

Address

Contractor's Name

Signature

Title

Address

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CONSTRUCTION PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

A. Prepare and submit to Engineer for review projected construction schedules. Update and revise schedules periodically to reflect progress of work.

1.3 FORM OF SCHEDULES

- A. Prepare in form of network analysis system using the Critical Path Method.
- B. Perform data preparation, analysis, charting and updating in accordance with pertinent recommendations contained in current edition of "CPM in Construction" manual of the Associated General Contractors.
- C. The network analysis system shall consist of a detailed network, mathematical analysis and a network diagram.
 - 1. The network diagram shall show the order and interdependence of activities and the sequence in which the work is to be accomplished as planned by the Contractor. The basic concept of a network analysis diagram will be followed to show how the start of a given activity is dependent on the completion of preceding activities and its completion restricts the start of following activities.
 - 2. Detailed network activities shown on the network diagram shall include, in addition to environmental protection and construction activities, the submittal for approval of samples and shop drawings, the procurement of critical materials and equipment and their installation and testing.
 - 3. Related activities shall be grouped on the network. The activities on the critical paths shall be highlighted. The network shall be time scaled using units of approximately one-half inch equals one week or other suitable scale approved by the Engineer. Weekends and holidays shall be indicated. Where slack exists, the activities shall be shown at the earliest time they are scheduled to be accomplished. Sheet size shall be 22" x 34" minimum.

- 4. The mathematical analysis of the network diagram shall include a tabulation of each activity shown on the detailed network diagram. The following information shall be furnished as a minimum for each activity.
 - a. Preceding and following event numbers.
 - b. Activity description.
 - c. Estimated duration of activities in units of working days (being the best estimate available at time of computation).
 - d. Earliest start date (by calendar date).
 - e. Earliest finish date (by calendar date).
 - f. Scheduled or actual start date (by calendar date).
 - g. Scheduled or actual finish date (by calendar date).
 - h. Latest start date (by calendar date).
 - i. Latest finish date (by calendar date).
 - j. Slack or Float.
 - k. Monetary value of activity.
 - 1. Responsibility for activity (Prime Contractor, subcontractors, suppliers).
 - m. Manpower required by trade and by total. Graphic representatives will be allowed.
 - n. Equipment required.
- 5. The mathematical analysis shall list the activities in sorts or groups as follows:
 - a. By the preceding event number from lowest to highest and then in the order of the following event number.
 - b. By the amount of slack, then in order of activity number.
 - c. By responsibility in order of earliest start date.

1.4 REVIEW OF SYSTEM

A. Participate in a review and evaluation of the proposed network diagrams and analysis by the Engineer. Revisions necessary as a result of this review shall be resubmitted to the Engineer within 10 days after the conference. Twenty days will be allowed for checking and further action by the Engineer. Progress payments will be withheld pending attainment of a mutually acceptable schedule. The mutually acceptable schedule shall then be the schedule to be used by the Contractor for planning, organizing, directing and executing the Work and for reporting progress. If the Contractor thereafter desires to make changes in his method of operating and scheduling he shall notify the Engineer in writing stating the reasons for the change. If the Engineer considers these changes to be of a major nature he may require the Contractor to revise and submit, without additional cost to the Owner, all of the affected portion of the network diagram and mathematical analysis to show the effect on the entire project. A change may be considered of a major nature if the time estimated to be required or actually used for an activity or the logic of sequence of activities is varied from the original plan to a degree that there is reasonable doubt as

CONSTRUCTION PROGRESS SCHEDULES

to the effect on the Contract completion date or dates. Changes which effect activities with adequate slack time shall be considered as minor changes, except that an accumulation of minor changes may be considered as a major change when their cumulative effect might affect the Contract completion date.

1.5 UPDATES

- A. Submit at intervals of 30 days a report of the actual construction progress by updating the mathematical analysis. All contract changes, including pending and approved change orders and field orders shall be included in the update schedule. Revisions causing changes in the detailed network shall be noted on the network or a revised issue of the affected portions of the detailed network furnished. The network shall be revised as necessary for the sake of clarity.
- B. The report shall show the activities or portions of activities completed during the reporting period and their total value as basis for the Contractor's periodic request for payment. Coordinate with the schedule of breakdown of lump sum items. The report shall state the percentage of the Work actually completed and schedule as of the report date and the progress along the critical path in terms of days ahead or behind the allowable dates. If the project is behind schedule, progress along other paths with negative slack shall be reported. Percentage of work actually completed will be reviewed by the Engineer. If the Contractor fails to submit the required monthly reports and updates within the time prescribed, the Engineer may withhold approval of progress payment estimates until such time as the Contractor submits the required reports and updates. Three copies of the report shall be submitted for each update.
- C. Simultaneously submit a narrative report with the updated analysis which shall include but not be limited to a description of the problem areas, current and anticipated delaying factors, their impact, and an explanation of corrective actions taken or proposed.

1.6 SUBMITTALS

- A. Within 15 days after execution of the AGREEMENT, submit 3 copies of a preliminary schedule indicating planned operations during first 60 days. Include cost of activities expected to be completed before submission and approval of the complete schedule.
- B. Within 30 days after execution of the AGREEMENT, submit 3 copies of the complete network analysis system. After review, submit 3 copies of the mutually acceptable system.
- C. Submit 3 copies of monthly reports and updates by the tenth day of the month.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01311

CONSTRUCTION PROGRESS SCHEDULES 01311-4

HEALTH AND SAFETY PLAN

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall, prior to the start of work on the site, prepare and submit for review, a site-specific health and safety plan. Work may not proceed at the project site until the Owner and/or Engineer have reviewed and approved the Contractor's health and safety plan. Any delays incurred by the Contractor relating to reviews of the health and safety plan shall be the responsibility of the Contractor and constitute no additional costs or claims to the Owner.
- B. Individuals involved in the excavation of potentially impacted soils shall be properly informed and trained in the recognition and response strategies involved with the hazards posed by these contaminants. The excavation of contaminated soils areas is not anticipated. However, the Contractor shall provide appropriate equipment (e.g., temporary fencing, drums) in the event hazardous materials are spilled or encountered.
- C. The Contractor shall be cognizant of the minimum standards set forth in OSHA 29 CFR 1910.120. The health and safety plan shall include, but not be limited to the following:
 - 1. Identification of Contractor's Site Safety Officer.
 - 2. Identification of Contractor's Designated Field Personnel.
 - 3. Type of Medical Surveillance Program.
 - 4. Identification of Hazard and Risks Associated with Project.
 - 5. Qualifications of any firms who will be performing work with hazardous materials or in hazardous environments. This shall include copies of individuals' hazardous materials certifications and licenses in particular regarding working with hazardous materials.
 - 6. Contractor's Standard Operating Procedures including Personnel Training and Field Orientation; Personal Hygiene Requirements & Guidelines; Field Monitoring Requirements of Site Contaminants; Respiratory Protection Training & Requirements; Levels of Protection and Selection of Equipment Procedures; Zone Delineation of the Project Site; Site Security and Entry Control Procedures; Contingency and Emergency Procedures; and Listing of Emergency Contacts.

- 7. The Contractor must be aware of site specific requirements such as site security during non-working hours, limited work space, and minimizing the effects of soil excavation to adjacent structures.
- 8. The Contractor shall make available complete sets of personal protective equipment and clothing to the Owner and Engineer for use during site inspections by the Owner and Engineer. These shall be supplied and maintained at no cost to the Owner, and shall be returned to the Contractor upon completion of the Work, except for expendable disposal protective clothing. Contractor shall provide a repository for collection of disposable health and safety materials. Collection and disposal of contaminated expendable supplies shall be at cost to the Contractor.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

- A. This section includes the following:
 - 1. Provide schedule of values covering each lump sum bid item.

1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 SUBMITTAL PROCEDURES:
 - 1. Schedule of values.
 - a. Revise and resubmit schedule until acceptable to the Engineer.
 - 2. Itemize separate line item cost for work involving each lump sum item.
 - a. Ensure that the sum of the items listed in the schedule of values for each lump sum item equals the price bid for the respective lump sum item.
 - b. For "Miscellaneous Items", items such as Bond premium and temporary construction facilities may be listed separately in the schedule, provided amounts can be substantiated.
 - 3. Breakdown installed costs into:
 - a. Delivered cost of product, material, equipment.
 - b. Total installed cost with overhead and profit.
 - (1) Do not list overhead and profit as separate items.
 - (2) An unbalanced schedule of values providing for overpayment

N. Lake Cochichewick Boat Launch	SCHEDULE OF VALUES
North Andover, MA	01370-1

on items of work performed first will not be accepted.

c. For drainage piping and structures, include a breakdown for testing, and putting into service.

1.4 SEQUENCING AND SCHEDULING

- A. Prepare schedule of values covering each lump sum item after review of tentative schedule at pre-construction conference, but before submission of first application for payment.
- B. Before submitting any application for payment, obtain the Engineer's approval of the Schedule of Values.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide digital construction photographs pertinent to the Contract Work during the Contract period as specified and as directed by the Engineer.
- B. Prior to the excavation in any street or cross country area, the Contractor may document existing conditions using construction photographs. Photographs for this purpose shall be at the Contractor's expense.

1.2 SUBMITTALS

- A. Description of techniques, materials, equipment, and resolution proposed to be used.
- B. Two copies of USB Flash Drives or other approved storage media containing all digital construction photos submitted on a monthly basis.

1.3 QUALITY ASSURANCE:

A. Photographer to use techniques, material and equipment capable of producing photographs of high quality and resolution.

PART 2 - PRODUCTS

- 2.1 DIGITAL FILES
 - A. Remain the property of the photographer.
 - B. Capable of producing sharp prints of high resolution (minimum of 12 megapixels) typical of an 8 inch by 10 inch print.
 - C. Photographer to retain digital files for a period of at least two years from the date of final acceptance of the entire Work under the Contract.
 - D. A minimum of 30 digital construction photos documenting construction activities shall be saved to an approved portable storage media and submitted to the Engineer on a monthly basis.

2.3 PRINT IDENTIFICATION

A. Each file shall carry identification consisting of date photograph taken (Month/Day/Year format) and primary subject of photograph.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. All views to contain a relative dimension reference that is easily recognizable by the average person. In views where dimensions are critical use a recognizable measuring devices such as folding ruler, measuring tape in a manner the markings are clear and sharp in the photograph and the device located in close relationship with subject of photograph.

3.2 SITE PHOTOGRAPHY REQUIRED

- A. Provide photographs at following stages of construction:
 - 1. Provide photos and documentation of all private and public property structures (docks, fencing, walls, etc) that will be affected by proposed construction.
 - 2. At 1-month intervals, progress photography during construction. Photos of any month need show only new Work performed during month.
 - 3. Provide post-construction photos and documentation of Site restoration of all private and public property structures (buildings, fencing, walls, etc).
 - 4. Such special photographs required by Engineer.
- B. Views:
 - 1. Coordinate with Engineer on views to be taken. In general, views from locations to adequately illustrate state of project and condition of construction.
 - 2. At least 3 different views of photographic subject except over-all Site photography to have at least 4 different views unless otherwise approved by Engineer.
 - 3. Succeeding photography of same photographic subject to be taken, insofar as practical, from the same view points as preceding photographic sessions. Variations in this procedure to be approved by Engineer.

QUALITY ASSURANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

- A. This section covers Quality Assurance and Control requirements for this contract.
- B. The Contractor is responsible for controlling the quality of work, including work of its subcontractors and suppliers and for assuring the quality specified in the Technical Specifications is achieved.

1.3 TESTING LABORATORY SERVICES

- A. All tests which require the services of a laboratory to determine compliance with the Contract Documents shall be performed by an independent commercial testing laboratory acceptable to the Engineer. The laboratory must be certified by the Commonwealth of Massachusetts for the parameters tested and required under the project. The laboratory shall be staffed with experienced technicians, properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
- B. Preliminary Testing Services: Unless otherwise specified, the Contractor shall be responsible for all testing laboratory services in connection with concrete materials and mix designs, the design of asphalt mixtures, gradation tests for structural and embankment fills, backfill materials, and all other tests and engineering data required for the Engineer's review of materials and equipment proposed to be used in the Work. The Contractor shall obtain the Engineer's acceptance of the testing laboratory before having services performed, and shall pay all costs for services.
- C. Quality Control Testing Services: Perform all quality control tests in the field or in the laboratory on concrete, asphalt mixtures, moisture-density (Modified Proctor) and gradation tests on structural and embankment fills, and backfill materials, in-place field density tests on structural and embankment fills, and other materials and equipment, during and after their incorporation in the Work. Field sampling and testing shall be performed in the general manner indicated in the specifications, with minimum interference with construction operations. The Engineer shall determine the exact time and location of field sampling and testing, and may require such additional sampling and testing as necessary to determine that materials and

equipment conform with data previously furnished by Contractor and with the Contract Documents.

- D. Arrangements for delivery of samples and test specimens to the testing laboratory will be made by the Contractor. The laboratory tests shall be performed within a reasonable time consistent with the specified standards. Furnish a written report of each test to the Engineer.
- E. Contractor shall furnish all sample materials and cooperate in the sampling and field testing activities, interrupting the Work when necessary. When sampling or testing activities are performed in the field, the Contractor shall furnish personnel and facilities to assist in the activities.
- F. The Contractor shall not retain any testing laboratory against which the Owner or the Engineer have reasonable objection, and if at any time during the construction process the services become unacceptable to the Owner, or the Engineer, either the Owner or the Engineer may direct in writing that such services be terminated. The request must be supported with evidence of improper testing or unreasonable delay. If the Engineer determines that sufficient cause exists, the Contractor shall terminate the services and engage a different testing laboratory.
- G. Transmittal of Test Reports: Written reports of testing and engineering data furnished by the Contractor for the Engineer's review of materials and equipment proposed to be used in the Work shall be submitted as specified for Shop Drawings.
- H. The testing laboratory shall furnish four copies of a written report of each test performed by laboratory personnel in the field or laboratory to the Contractor. Distribution shall be two copies of each test report to the Engineer's Representative, one copy to the Owner, and one copy for the Contractor within three days after each test is completed.

1.4 QUALITY ASSURANCE

- A. Codes and Standards: Refer to Article 3 Contract Documents, Intent, Amending, Reuse, of the General Conditions.
- B. Copies of applicable referenced standards are not included in the Contract Documents. Where copies of standards are needed by the Contractor for superintendence and quality control of the work, the Contractor shall obtain a copy or copies directly from the publication source and maintain at the jobsite, available to the Contractor's personnel, subcontractors, and Engineer.
- C. Quality of Materials: Unless otherwise specified, all materials and equipment furnished for permanent installation in the Work shall conform to applicable standards and specifications and shall be new, unused, and free from defects and imperfections, when installed or otherwise incorporated in the Work. Material and equipment shall not be used by the Contractor for any purpose other than that intended or specified unless such use is authorized by the Engineer.

D. Where so specified, products or workmanship shall also conform to the additional performance requirements included within the Contract Documents to establish a higher or more stringent standard or quality than that required by the referenced standard.

1.5 OFFSITE INSPECTION

- A. When the specifications require inspection of materials or equipment during the production, manufacturing, or fabricating process, or before shipment, such services shall be performed by an independent testing laboratory, or inspection organization acceptable to Engineer in conjunction with or by the Engineer.
- B. The Contractor shall give appropriate written notice to the Engineer not less than 30 days before offsite inspection services are required, and shall provide for the producer, manufacturer, or fabricator to furnish safe access and proper facilities and to cooperate with inspecting personnel in the performance of their duties.
- C. The inspection organization shall submit a written report to the Contractor who shall provide copies to the Engineer.

1.6 MATERIALS AND EQUIPMENT

- A. The Contractor shall maintain control over procurement sources to ensure that materials and equipment conform to specified requirements in the Contract Documents.
- B. The Contractor shall comply with manufacturer's printed instructions regarding all facets of materials and/or equipment movement, storage, installation, testing, startup, and operation. Should circumstances occur where the contract documents are more stringent than the manufacturer's printed instructions, the Contractor shall comply with the specifications. In cases where the manufacturer's printed instructions are more stringent than the contract documents, the Contractor shall advise the Engineer of the disparity and conform to the manufacturer's printed instructions. In either case, the Contractor is to apply the more stringent specification or recommendation, unless approved otherwise by the Engineer.

1.7 SHOP AND FIELD TESTING

- A. The Contractor is also responsible for providing the shop and field testing specified in the technical specification sections.
- B. The Contractor and its Subcontractor shall perform inspections, tests, and other services as required by the Contract Documents.
- C. Contractor shall provide twenty one days notice to the Engineer so that the Engineer may witness Contractor and/or Subcontractors off site and on site tests. The

Engineer's witnessing of tests does not relieve the Contractor and/or Subcontractors of their obligation to comply with the requirements of the Contract Documents.

1.8 MANUFACTURER'S FIELD SERVICES

- A. When specified in the technical specifications sections, the Contractor shall arrange for and provide technical representation from manufacturer's of respective equipment, items or components. The manufacturer's representative shall be a factory trained service engineer/technician with the type and length of experience specified in the technical specifications.
- B. Services Furnished Under This Contract: An experienced, competent, and authorized factory trained service engineer/technician representative of the manufacturer of each item of equipment for which field services are indicated in the specifications shall visit the site of the Work and inspect, operate, test, check, adjust if necessary, and approve the equipment installation. In each case, the manufacturer's service representative shall be present when the equipment is placed in operation. The manufacturer's service representative shall revisit the jobsite as often as necessary until all problems are corrected and the equipment installation and operation are satisfactory to the Engineer.

1.9 CERTIFICATION FORMS AND CERTIFICATES

A. The Contractor shall be responsible for submitting the certification forms and certificates in conformance with the requirements specified in Section 01300 - Submittals.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 QUALITY CONTROL

- A. Quality control is the responsibility of the Contractor, and the Contractor shall maintain control over construction and installation processes to assure compliance with specified requirements.
- B. Certifications for personnel, procedures, and equipment associated with special processes (e.g., welding, cable splicing, instrument calibration, surveying) shall be maintained in the Contractor's field office, available for inspection by the Engineer. Copies will be made available to the Engineer upon request.
- C. Means and methods of construction and installation processes are the responsibility of the Contractor, and at no time is it the intent of the Engineer or Owner to supersede or void that responsibility.

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 TEMPORARY UTILITIES

- A. Temporary Light and Power: The Contractor shall at his own expense, provide his own temporary light and power as required for the prosecution and completion of work.
- B. Sanitary Provisions: The Contractor shall provide and maintain sanitary accommodations for the use of his employees and the Engineer, as may be necessary to comply with the requirements and regulations of the local and state departments of health.
- C. Maintaining Operation of the Existing Facilities:
 - 1. The Contractor shall be responsible for careful consideration of the construction, scheduling and anticipation of potential interference with existing utilities, operations and structures. The Contractor shall maintain close communications with the Engineer and provide the Engineer with a detailed description of each proposed activity sufficiently in advance of its commencement for review and comments to be made.
 - 2. Temporary facilities which may be required include, but are not limited to, electrical power; lighting; ventilating; potable water; fire protection; drainage; sanitary facilities; trench covers; protection of existing utilities; structures; streams; trees and shrubs; access roads; sewage conveyance; piping.

1.3 ACCESS TO THE WORK

- A. The Contractor shall provide sufficient and proper facilities at all times for inspection of all work under this project in preparation or in progress, by the Owner, the agents and employees of the Owner, by authorized representatives of the State of Massachusetts and the Federal Government and by the Engineers.
- B. The Contractor shall furnish the Engineer or his authorized representative and other personnel mentioned above with such facilities and assistance as are necessary to ascertain performance of the work in accordance with the plans and specifications.

CONTROL OF MATERIALS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions, Division 0 and Division 1 Specification Sections, apply to this section.

1.2 APPROVAL OF MATERIALS

- A. Unless otherwise specified, only new materials and equipment shall be incorporated in the work. All materials and equipment furnished by the Contractor shall be subject to the inspection and approval of the Engineer. No material shall be delivered to the work without prior approval of the Engineer.
- B. As specified in Section 01300 Submittal Procedures, the Contractor shall submit to the Engineer, data relating to materials and equipment he proposes to furnish for the work. Such data shall be in sufficient detail to enable the Engineer to identify the particular product and to form an opinion as to its conformity to the specifications.
- C. Facilities and labor for handling and inspection of all materials and equipment shall be furnished by the Contractor. If the Engineer requires, either prior to beginning or during the progress of the work, the Contractor shall submit additional samples or materials for such special tests as may be necessary to demonstrate that they conform to the specifications. Such samples shall be furnished, stored, packed, and shipped as directed at the Contractor's expense. Except as otherwise noted, the Owner will make arrangements for and pay for the tests.
- D. Any delay of approval resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of a claim against the Owner or the Engineer.
- E. In order to demonstrate the proficiency of workmen or to facilitate the choice among several textures, types, finishes, and surfaces, the Contractor shall provide such samples of workmanship or finish as may be required.
- F. The materials and equipment used on the work shall correspond to the approved samples or other data.

1.3 REJECTED MATERIALS AND DEFECTIVE WORK

A. Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the specifications shall forthwith be removed from the work by the Contractor, and shall not be made use of elsewhere in the work. Any errors, defects or omissions in the execution of the work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor and in a manner satisfactory to the Engineer. The Contractor shall reimburse the Owner for any expenses, losses or damages incurred in consequence of any defect, error, omission or act of the Contractor or his employees, as determined by the Engineer, occurring previous to the final payment.

PART 2 - PRODUCTS (NOT USED)

PAGE 3 - EXECUTION (NOT USED)

DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.1 SUMMARY

A. This section specifies the general requirements for the delivery, handling, storage and protection for all items required in the construction of the Work. Specific requirements, if any, are specified with the related item.

1.2 TRANSPORTATION AND DELIVERY

- A. Transport and handle items in accordance with manufacturer's printed instructions.
- B. Schedule delivery to reduce long-term on-site storage prior to installation and/or operation. Under no circumstances shall equipment be delivered to the Site more than one month prior to installation without written authorization from the Engineer.
- C. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.
- D. Deliver products to the Site in manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting and installing.
- E. All items delivered to the Site shall be unloaded and placed in a manner which will not hamper the Contractor's normal construction operation or those of subcontractors and other Contractors and will not interfere with the flow of necessary traffic.
- F. Provide equipment and personnel to unload all items delivered to the Site.
- G. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by others (i.e. Owner, other Contractors), perform inspection in the presence of the Engineer. Notify Engineer verbally, and in writing, of any problems.

1.3 STORAGE AND PROTECTION

- A. Store and protect products in accordance with the manufacturer's printed instructions, with seals and labels intact and legible. Storage instruction shall be studied by the Contractor and reviewed with the Engineer. Instructions shall be carefully followed and a written record of this kept by the Contractor. Arrange storage to permit access for inspection.
- B. Store loose granular materials on solid flat surface in a well-drained area. Prevent mixing with foreign matter.

- C. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural, miscellaneous and reinforcing steel shall be stored off the ground or otherwise to prevent accumulation of dirt or grease, and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking. Brick, block and similar masonry products shall be handled and stored in manner to reduce breakage, cracking and spalling to a minimum.
- D. All mechanical and electrical equipment and instruments subject to corrosive damage by the atmosphere (even though covered by canvas) shall be stored in a weathertight building to prevent injury. The building may be a temporary structure on the Site or elsewhere, but it must be satisfactory to the Engineer. Building shall be provided with ventilation to prevent condensation. Maintain temperature and humidity within range required by manufacturer.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)
IDENTIFICATION SYSTEMS (PROJECT SIGNS)

<u>PART 1 – GENERAL</u>

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions, Division 0 and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

- A. The work covered under this Section of the Specifications includes the following:
 - 1. Furnish, install, and maintain project signs.
 - 2. Furnish, install, and maintain DEP project file number signs.
 - 3. Remove signs on completion of construction.
 - 4. Allow no other signs to be displayed.

1.3 SYSTEM DESCRIPTION

- A. Project Signs:
 - 1. Painted signs with painted lettering, or standard products:
 - i. Size of signs and lettering: As required by regulatory agencies, and/or as specified herein or as appropriate to usage.
 - ii. Colors: As required by regulatory agencies, otherwise uniform colors throughout Project.
 - iii. Furnish, erect, and maintain job instruction signs, such as "DANGER," "KEEP OFF," "NO PARKING," etc., as may be required to conduct the Work safely. Such signs shall be neat in appearance, maintained in good condition, and promptly removed when they have served their purpose.
 - 2. Erect at appropriate locations to provide required information.
 - 3. Contractor shall apply for all required permits to allow installation of project signs.

1.4 SUBMITTALS

A. Submit project sign layout for Engineer's approval in accordance with the Conditions of the Contract and Division 1 Specification sections and as specified herein.

1.5 QUALITY ASSURANCE

A. Finishes, Painting: Project sign shall resist weathering and fading for the duration of the construction period.

1.6 MAINTENANCE

A. Maintain signs and supports in a neat, clean condition; repair damages to structures, framing or sign.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Wood Exterior Paint
 - 1. Tnemec Company, Inc., North Kansas, Missouri
 - 2. The Glidden Co., Cleveland, Ohio
 - 3. PPG Industries Inc., Pittsburgh, Pennsylvania
 - 4. or Engineer approved equal.

2.2 MATERIALS

- A. Project Sign Materials
 - 1. Structure and Framing: May be new or used, wood in sound condition, structurally adequate to work, and suitable for specified finish.
 - 2. Sign Surfaces: Exterior softwood plywood with medium density overlay, standard large sizes to minimize joints:
 - i. Thickness: As required by standards to span framing members, to provide even, smooth surface without waves or buckles.
 - 3. Wrought Hardware: Galvanized.
 - 4. Alkyd Gloss Paint System:
 - i. Give priming coat (2.5 mil thick) to entire woodwork of sign.
 - ii. Give two (2) (1.5 mil) coats of white exterior Alkyd Gloss paint to sign including framework.
 - 5. Sign shall be a minimum size of 48 inches by 96 inches.
- B. DEP Project File Number Signs

- 1. The signs shall be professionally prepared. Each sign shall be constructed of ³/₄inch minimum thickness exterior plywood (A-B) or APA high density overlay plywood (HDO).
- 2. All fasteners used in the sign construction shall be galvanized or stainless steel. All fasteners shall be rustproof.
- 3. The sign face backgrounds shall consist of at least three (3) coats of white outdoor enamel paint. The rear side to be painted with one (1) coat of white outdoor enamel paint. All lettering shall be black.
- 4. The Conservation Commission project file number signs shall be not less than 2-feet square or more than 3-feet square in area. The signs shall bear the words "MassDEP File #157-594".

PART 3 - EXECUTION

3.1 PREPARATION

- A. Project Sign
 - 1. Wood surface shall be clean and dry. Paint exposed surface of supports, framing, and surface material; one coat of primer and two coats of exterior paint as indicated herein.
 - 2. Paint graphics in styles, sizes, and colors selected.
 - 3. Sign layout as approved by Engineer and Owner.

3.2 ERECTION

- A. Project Sign:
 - 1. Erect project signs at location selected by Engineer.
 - 2. Maintain in good condition until completion of project.
 - 3. Remove signs, framing, supports, and foundations at completion of project.
- B. DEP Project File Number Signs
 - 1. Mount sign adjacent to the work site. For projects with multiple sites, mount sign at main entrance to site. Post at the entrance of the wells within clear view from the public way.

3.3 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700 – Contract Closeout

END OF SECTION 01620

N. Lake Cochichewick Boat Launch North Andover, MA IDENTIFICATION SYSTEMS 01620-3

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CONTRACT CLOSEOUT

PART 1 – GENERAL

1.1 SUMMARY

- A. This section specifies administrative and procedural requirements for project closeout, including but not limited to:
 - 1. Closeout procedures.
 - 2. Final cleaning.
 - 3. Adjusting.
 - 4. Record Documents.

1.2 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- B. Provide submittals to Engineer that are required by governing or other authorities.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payment, and sum remaining due.
- D. Submit all warranties.
- E. Submit written notice that all subcontractors and suppliers have been paid in full.
- F. Submit written notice showing the disposition of all insurance filings and claims.
- G. Copy of "Statement of Compliance" filed with the Division of Labor and Workforce Development, as required under the State Wage Rate Provisions.

1.3 RECORD DOCUMENTS

- A. Maintain on Site, one set of the following documents; actual revisions to the Work shall be recorded in these documents:
 - 1. Contract Drawings
 - 2. Specifications

- 3. Addenda
- 4. Change orders and other Modifications to the Contract
- 5. Reviewed Shop Drawings, product data, and samples.
- 6. Written interpretations and clarifications.
- 7. Field orders.
- 8. Field test reports properly verified.
- 9. Upon completion of the project Record Drawings shall be submitted to the Engineer.
- B. Store As-built Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
 - 1. Manufacturer's name, address and telephone number and product model and serial number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and Modifications.
- E. Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured horizontal and vertical location of excavation limits referenced to permanent surface bounds.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension of detail.
 - 5. Details not on original Contract Drawings.

1.4 FINAL CLEANING

- A. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
 - 1. Clean the Site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

1.5 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01700

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CLEANING UP

PART 1 - GENERAL

1.1 SUMMARY

- A. During its progress, the Work and the adjacent areas affected thereby shall be cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
- B. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes structures, Work done under this Contract, or elsewhere during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the Work, and the ditches, channels, drains, pipes, structures, and Work, etc., shall, upon completion of the Work, be left in a clean and neat condition.
- C. On or before the completion of the Work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary Works, tools, and machinery or other construction equipment furnished by him; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.
- D. The Contractor shall thoroughly clean all materials and equipment installed by him and his subcontractors, and on completion of the Work shall deliver it undamaged and in fresh and new-appearing condition. All mechanical equipment shall be left fully charged with lubricant and ready for operation.
- E. The Contractor shall restore or replace, when and as directed, any public or private property damaged by his Work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary driveway, walk, and landscaping Work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as Work progresses and shall not be left until the end of the Contract period.
- F. All material disposal is subject to Specification Section 02060.

1.2 MATERIAL OR DEBRIS IN DRAINAGE FACILITIES

A. Where material or debris has washed or flowed into or has been placed in existing watercourses, ditches, gutters, drains, pipes, structures, such material or debris shall be entirely removed and satisfactorily disposed of during progress of the work, and the ditches, channels, drains, pipes, structures, and work shall, upon completion of the work, be left in a clean and neat condition.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01710

DIVISION 2

SITE WORK

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EROSION AND SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies equipment and materials for an erosion and sediment control program for minimizing erosion and siltation during the construction phase of the project. The erosion and sediment control provisions detailed on the Drawings and specified herein are the minimum requirements for installation and maintenance of erosion controls. The Contractor shall provide additional erosion and sediment control principles specified herein.

1.2 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section, and:
 - 1. Section 02200 Earthwork
 - 2. Section 02140 Dewatering and Discharge
 - 3. Section 02160 Temporary Excavation Support Systems
 - 4. Section 02273 Geotextile Filter Fabric

1.3 SUBMITTALS

- A. Proposed methods, materials to be employed, and schedule for effecting erosion and siltation control and preventing erosion damage shall be submitted for approval. Submittals shall include:
 - 1. List of proposed materials including manufacturer's product data.
 - 2. Perimeter (Limit of Work) Erosion Controls damaged during construction shall be replaced immediately and installed per the Details. Schedule of any additional erosion control program indicating specific dates for implementing programs in each major area of Work, including dewatering sedimentation basin(s) shall be submitted prior to installation.

1.4 REFERENCES

A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by basic designation only.

- 1. Massachusetts Department of Public Works, and The Commonwealth of Massachusetts Department of Public Works; Construction Standards.
- 2. Massachusetts Department of Environmental Protection.

1.5 EROSION CONTROL PRINCIPLES

A. Erosion Control Principles

The following erosion control principles shall apply to the land grading and construction phases:

- 1. Stripping of vegetation, grading, or other soil disturbance shall be done in a manner which will minimize soil erosion.
- 2. Whenever feasible, natural vegetation shall be retained and protected.
- 3. Extent of area which is exposed and free of vegetation and duration of its exposure shall be kept within practical limits.
- 4. Temporary seeding, mulching, or other suitable stabilization measures shall be used to protect exposed critical areas during prolonged construction or other land disturbance. Prolonged exposure of unstabilized soil shall not exceed 60 days.
- 5. Drainage provisions shall accommodate increased runoff resulting from modifications of soil and surface conditions during and after development or disturbance. Such provisions shall be in addition to existing requirements.
- 6. Sediment shall be retained on-site.
- B. Erosion Protection

Cut and fill slopes and stockpiled materials shall be protected to prevent erosion. Slopes shall be protected with permanent erosion protection when erosion exposure period is expected to be greater than or equal to two months, and temporary erosion protection when erosion exposure period is expected to be less than two months.

- 1. Permanent erosion protection shall be accomplished by seeding with grass and covering with an erosion protection material, as appropriate for prevailing conditions.
- 2. Temporary erosion protection shall be accomplished by covering with an erosion protection material, as appropriate for prevailing conditions.
- 3. Except where specified slope is indicated on Drawings, fill slopes shall be limited to a grade of 3:1 (horizontal: vertical) cut slopes shall be limited to a grade of 2:1.

PART 2 - PRODUCTS

2.1 FIBER ROLLS

- A. Fiber Rolls for construction of erosion control devices shall be blown or placed media (mulch or compost) in 12-inch diameter biodegradable filter sock.
- B. Wooden stakes (2-in. by 2-in. by 36-in.) shall be placed 10 foot on center, driven a minimum of 12 inches into the ground.
- C. Fiber Rolls shall be trenched 3-5 inches into the ground.
- D. Fiber Rolls shall be placed a minimum of 1 foot back from drain inlets.

2.2 Silt Fencing

- A. Silt Fence shall be erected in a continuous fashion from a single roll of fabric such as polypropylene, nylon, polyester, or polyethylene yarn.
- B. Silt Fence for Erosion Control shall have the following minimum physical properties:

1.	Filtering Efficiency:	75%
2.	Tensile Strength:	30 lb./linear inch (standard), 50 lb. linear inch (extra strength)
3.	Elongation:	20%
4.	Ultraviolet Radiation:	90%
5.	Slurry Flow Rate:	0.3 gal/sf/minute

- C. The bottom of fabric shall be installed 4-6 inches below the ground.
- D. Stakes shall be spaced 6 feet on center on the downstream side of the fabric.

2.3 SILT BAGS

A. Silt bags shall be utilized for dewatering activities. The silt bags shall be in accordance with the construction details on the Drawings and as specified herein. Silt bags shall be sized by the Contractor based on dewatering flows. Silt Bags shall be "DirtBag 55-DOT" as manufactured by ACF Environmental, or Engineer approved Equal

Property	Test Method	Units	Min. Requirements
* *			*
Grab Tensile	ASTM D-4632	lbs.	205
CBR Puncture	ASTM D-6241	lbs.	525

Flow Rate	ASTM D-4491	gal/min/sf	80
Permittivity	ASTM D-4491	sec ⁻¹	1.2
App. Open Size %	ASTM D-4751	in	0.0059 (US Sieve 100)

2.3 SILT SACKS

A. Silt sacks for catch basin inlet protection shall be ACF Environmental High Flow or equal. Minimum physical properties of the geosynthetic shall be as follows:

Property	Test Method	Units Min	a. Requirements
Trapezoid Tear	ASTM D-4533	lbs.	90x71
UV Resistance	ASTM D-4355	%	99.4
AOS	ASTM D-4751	US Sieve	20
Flow Rate	ASTM D-4491	gal/min/sf	100.6
Permittivity	ASTM D-4491	sec ⁻¹	4.81

2.3 TEMPORARY SEED COVER

A. If required, seed mixture for temporary cover by hydroseeding application shall conform to the following:

Quantity per 1000 sq. ft. Coverage	<u>Material</u>
27-1/2 lb.	Wood Fiber Mulch
4 lb.	Seed
½ lb.	Annual Ryegrass
22 lb.	10-6-4 Fertilizer
69 gal.	Water

B. Hydroseeding Equipment

Hydroseeding equipment may be either portable or truck mounted, with dual agitation, a minimum working volume of 1000 gallons and a minimum spray range of 80 ft.

- 1. Hydroseeding equipment must be capable of uniformly applying the slurry mix including wood fiber mulch if required, at the specified rate, and at the required locations.
- 2. Hydromulching equipment, either trailer or truck mounted, must be capable of uniformly applying straw or hay mulch at a minimum mulching rate of 8 tons per hour, at a distance of not less than 80 ft.

PART 3 - EXECUTION

3.1 HYDROSEEDING

- A. If required for long-term disturbance greater than 60 days, seed for temporary cover shall be spread by the hydroseeding method, utilizing power equipment commonly used for that purpose. Seed, fertilizer, mulch and water shall be mixed and applied to achieve application quantities specified. Material shall be applied in 2 equal applications, with the equipment during the second pass moving perpendicular to direction employed during the first pass. Hydroseeding shall not be done when it is raining or snowing, or when wind velocity exceeds 5 mph.
- B. If the results of hydroseeding application are unsatisfactory, the mixture and/or application rate and methods shall be modified to achieve the required results.
- C. After the grass has appeared, all areas and parts of areas which fail to show a uniform stand of grass, for any reason whatsoever, shall be reseeded and such areas and parts of areas seeded repeatedly until all areas are covered with a satisfactory growth of grass.

3.2 MAINTENANCE AND REMOVAL OF EROSION CONTROL DEVICES

- A. Wetland area, water courses, and drainage swales adjacent to construction activities shall be monitored continuously for evidence of silt intrusion and other adverse environmental impacts, which shall be corrected immediately upon discovery.
- B. Culverts and drainage ditches shall be kept clean and clear of obstructions during construction period.
- C. Erosion Control Devices
 - 1. Sediment behind the erosion control device shall be checked twice each month and after heavy rain. Silt shall be removed if greater than 6 in. deep.
 - 2. Condition of erosion control devices shall be checked weekly and before and after significant storm events. Damaged and/or deteriorated items shall be replaced. Erosion control devices shall be maintained in place and in effective condition.
 - 3. Filter sock shall be inspected frequently and maintained or replaced as required to maintain both their effectiveness and essentially their original condition. Underside of bales shall be kept in close contact with the earth below at all times, as required to prevent water from washing beneath bales.
 - 4. Sediment deposits shall be properly disposed of, in a location and manner which will not cause sediment nuisance elsewhere.
- D. Removal of Erosion Control Devices
 - 1. Erosion control devices shall be maintained until all disturbed earth has been vegetated or restored, at which time they shall be inspected by the

Conservation Agent prior to removal. After removal, areas disturbed by these devices shall be regraded and seeded.

2. Erosion protection material shall be kept securely anchored until acceptance of the entire Project.

END OF SECTION 02020

DEMOLITION, MODIFICATION, AND ABANDONMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall furnish all plant, labor, tools, equipment, materials, and supplies as required for utility and structure removal, demolition, modification, and/or abandonment as specified.
- B. The Work of this Section shall include demolition of, roadway and sidewalk; removal or abandonment in place of existing water mains, drains, sewers, and appurtenance structures; and demolition.

1.2 DESCRIPTION

- A. The work of this Section includes, but is not limited to, the following:
 - 1. Obtaining all necessary permits, providing necessary notifications, and complying with all local, state, and federal laws regarding safety and demolition.
 - 2. Stockpiling, removal, and legal disposal or recycling of demolished materials. Salvage value accrues to the Contractor.
 - 3. The protection of areas outside the Limits of Work including paved roadways.
 - 4. The protection of utilities which are scheduled to remain.
 - 5. The control of dust.
- B. Refer to the Drawings for additional requirements for demolition.

1.3 SUBMITTALS

- A. The Contractor shall submit the following items:
 - 1. A utility demolition plan which has been fully coordinated with the Owner, that describes the locations, cutting, capping, removal, and disposal of existing utility services, and the maintenance and protection of temporary and permanent services.
 - 2. Disposal receipts from the recycling site or solid waste disposal facility at the completion of the project.

DEMOLITION, MODIFICATION, AND ABANDONMENT

1.4 REPAIR OF DAMAGE

- A. Any damage to existing facilities to remain, as caused by the Contractor's operations shall be repaired at no additional cost to the Owner.
- B. Damaged items that are to remain in place shall be repaired or replaced with new materials as required to restore damaged items or surfaces to a condition equal to and matching that existing prior to damage or start of Work of this Contract.

1.5 PROTECTION OF EXISTING WORK

- A. Before beginning any cutting, trenching or demolition work, the Contractor shall carefully review the work sequence and examine the Drawings and Specifications to determine the extent of the Work. The Contractor shall take all necessary precautions to prevent damage to existing facilities, which are to remain in place, and be responsible for any damage that is caused by the operations. Existing facilities so damaged shall be repaired or replaced to their undamaged condition at no additional cost to the Owner.
- B. The Contractor shall carefully consider all bearing loads and capacities for placement of equipment and material on Site. In the event of any questions as to whether an area to be loaded has adequate bearing capacity, the Contractor shall consult with the Owner prior to the placement of such equipment or material.

1.6 JOB CONDITIONS

- A. The Owner assumes no responsibility for actual condition of the facilities to be removed, abandoned or modified. The Contractor shall visit the Site; inspect all facilities to get familiarized with all existing conditions and utilities.
- B. The Owner may occupy portions of the utilities, structures, properties or other facilities immediately adjacent to demolition area. Conduct demolition, modification and abandonment so Owner's operations will not be disrupted. Provide not less than 24 hour notice to Owner of activities that will affect Owner's operations.
- C. Traffic: Conduct operations and removal of debris to ensure minimum interference with the normal use of public ways and other adjacent facilities. Do not close or obstruct traffic ways, streets, walks, or other used facilities without the written permission of the Owner and authorities having jurisdiction. The Contractor shall coordinate with the Owner to provide access, circulation, vehicle parking, and security to the areas that are to remain. Traffic management shall be performed in accordance with Section 01850 TRAFFIC MANAGEMENT.
- D. Protection: Prevent injury to persons and damage to abutting property. Provide adequate shoring and bracing to prevent uncontrolled collapse. Immediately repair damaged property to its condition before being damaged. Take effective measures

to prevent windblown dust. Do not create ice hazards by water spraying in cold weather.

- E. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Engineer.
- F. Storage or sale of removed items or materials on-site will not be permitted.
- G. Utilities: Maintain service to all properties connected to portions of Work in this Contract. All above and below grade utilities, other than those scheduled to be removed, abandoned or demolished, shall be supported and protected in accordance with this section.

1.7 QUALITY ASSURANCE

- A. Comply with Section 01400 QUALITY ASSURANCE.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during demolition by methods and with materials so as not to void existing warranties.

PART 2 – PRODUCTS

- 2.1 MATERIALS
 - A. Comply with material and installation requirements specified in individual Specification Sections.

2.2 MATERIALS OWNERSHIP

A. Coordinate with Engineer and Owner, who will make final determination as to whether an item is to be salvaged or removed. Except for items or materials indicated or determined to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project Site.

2.3 REPAIR MATERIALS

A. Use repair materials identical to existing materials. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible. Use materials whose installed performance equal or surpasses that of existing materials.

DEMOLITION, MODIFICATION, AND ABANDONMENT

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PART 3 – EXECUTION

3.1 **DEFINITIONS**

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled. Disposal shall be at a recycling facility to the extent possible.
- B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Items so designated are existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.
- E. Abandon: Items so designated are existing facilities that are not located within the alignment of proposed Work that shall be permanently abandoned in place.

3.2 DEMOLITION AND ABANDONMENT PROCEDURES

- A. Disposal of all materials shall be performed in compliance with applicable local, state, and federal codes and requirements. Provide labor, equipment, and materials to perform Work as specified and indicated.
- B. The Contractor shall flush all pipe and structures to be removed or abandoned to remove solids, wastewater, and other objectionable material prior to commencing demolition, modification, or abandonment.
- C. Existing pipe and structures shall be removed where designated on the Drawings or where necessary to install new pipe or structures. When existing pipe is removed, the Contractor shall plug all resulting abandoned connections whether or not shown. Where removed piping is exposed, the remaining piping shall be fitted with a removable cap or plug, or bulk headed. Where existing pipe is to be abandoned, the Contractor shall cut back the abandoned pipe for a distance of 5 feet from any connecting structures to remain. Pipes to be abandoned in structures to be abandoned may be capped, plugged or bulk headed from inside the structure. All holes at the existing structures shall be repaired.
- Unless otherwise specified or noted on the Drawings, pipes that are left in place that are greater than 6-inch diameter shall be filled with Controlled Density Fill (CDF). Pipes that are left in place and are 6-inch or less in diameter may be left unfilled. See Specification Section 02200 for CDF specifications.
- E. Where existing structures such as catch basins, drain manholes, and sewer DEMOLITION, MODIFICATION, AND ABANDONMENT

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manholes are to be abandoned in place, the Contractor shall remove the frames, grates, covers, and shall remove the top section as required to cut the structures down a minimum of 5 feet below final grade. The Contractor shall check that all pipe penetrations and any other holes have been capped, plugged or bulk-headed, shall crack and compact the structure bottom and fill abandoned manholes with flowable fill. Backfill around the structure to existing grade in accordance with Section 02200 – EARTHWORK.

- F. Pipes shall be capped with mechanical joint caps wherever practicable. If required, permanent plugs shall be constructed of Class B concrete, brick and mortar, or other material approved by the Engineer. Brick shall be installed into the pipe to a distance equal to the diameter of the pipe being plugged.
- G. Fill excavations with solid fill resulting from earth removal operations and/or with select borrow material in accordance with Section 02200 EARTHWORK. Final grade to be restored in kind unless otherwise noted.
- H. Exercise precautions for fire prevention. Make fire extinguishers approved for Class A, B and C fires available at all times in areas where performing demolition or abandonment Work with burning torches. Do not burn demolition debris on Site.

3.3 REHABILITATION/MODIFICATION PROCEDURES

- A. Certain areas of existing piping, conduits, and the like will be affected by Work necessary to complete modifications under this Contract. The Contractor shall be responsible to rehabilitate those areas affected by his construction activities.
- B. When new piping is installed in existing manholes, catch basins or other structures, the Contractor shall accurately position core-drilled openings in the concrete as shown or otherwise required. Openings shall be of sufficient size to permit a final alignment of pipelines and fittings without deflection of any part and to allow adequate space for satisfactory installation of a flexible connector to ensure water tightness around openings so formed.
- C. When new piping is to be connected to existing piping, the existing piping shall be cut square and ends properly prepared for the connection shown. Any damage to the lining and coating of the existing piping shall be repaired by the Contractor.

3.4 DISPOSAL OF REMOVED/DEMOLISHED MATERIALS

- A. The Contractor shall prepare and transport all demolition debris, materials, refuse, and abandoned equipment to an approved disposal site as part of the Work under this Section. All costs associated with the proper performance of this Work shall be borne solely by the Contractor at no additional cost to the Owner.
- B. Storage, handling, disposal and transportation of demolition debris shall be in accordance with Specification Section 02080.

- C. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site. Demolition material shall not be reused as fill. Removal of demolition debris shall be conducted to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities which shall not be closed or obstructed without permission from the Owner. Alternate routes shall be provided around closed or obstructed traffic ways.
- D. Burning: Do not burn demolished materials.

3.5 REPAIR OF DAMAGE

A. Any damage to existing facilities to remain, as caused by the Contractor's operations shall be repaired at no additional cost to the Owner. Damaged items shall be repaired or replaced with new materials as required to restore damaged items or surfaces to a condition equal to and matching that existing prior to damage or start of Work of this Contract.

END OF SECTION 02050

TREE PROTECTION AND TRIMMING

PART 1 – GENERAL

1.1 SUMMARY

A. This Section includes the protection and trimming of trees that interfere with, or are affected by, execution of the Work, whether temporary or new construction. It also covers tree pruning when necessary in the vicinity of the site Work.

1.2 RELATED SECTIONS

- A. Drawings and general provisions of DIVISION 0 BIDDING AND CONTRACT REQUIREMENTS and other DIVISION 1 Specification Sections, apply to this section. Related Sections include the following:
 - 1. Section 02920 TOPSOIL

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of engineers and owners, and other information specified.
- C. Certification: From a qualified arborist that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

1.4 QUALITY ASSURANCE

- A. Tree Service Qualifications: An experienced tree service firm to be consulted as necessary.
- B. Arborist Qualifications: An arborist certified by the International Society of Arboricultural or licensed in the jurisdiction where Project is located, to be consulted as necessary.
- C. Tree Pruning Standards: Comply with ANSI A300, "Trees, Shrubs, and Other Woody Plant Maintenance--Standard Practices," unless more stringent requirements are indicated.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Drainage Fill: Selected 2 1/2 inch crushed stone, and with not more than 10 percent passing a 3/4-inch sieve.
- B. Topsoil: Fertile, friable, surface soil, containing natural loam and complying with ASTM D 5268. Provide topsoil that is free of stones larger than 1 inch in any dimension and free of other extraneous or toxic matter harmful to plant growth. Obtain topsoil only from well-drained sites where soil occurs in depth of 4 inches or more; do not obtain from bogs or marshes.
- C. Filter Fabric: Manufacturer's standard, nonwoven, pervious, geotextile fabric of polypropylene, nylon, or polyester fibers, as manufactured by US Fabrics, model # US 120NW or approved equal.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Protect tree root systems from damage due to noxious materials caused by runoff or spillage while mixing, placing, or storing construction materials. Protect root systems from flooding, eroding, or excessive wetting caused by dewatering operations.
- B. Do not store construction materials, debris, or excavated material within the drip line of remaining trees. Do not permit vehicles or foot traffic within the drip line; prevent soil compaction over root systems.
- C. Do not allow fires under or adjacent to remaining trees or other plants.

3.2 TREE PROTECTION

- A. A tree protection zone shall be established for each tree in the work area extending out from the center of the trunk to a radius of 1.5 feet per inch of trunk diameter. Trunk diameter shall be measured at 4.5 above ground level.
- B. Fencing shall be installed around the tree protection zone. No storage of materials or parking shall be allowed within the tree protection zone.
- C. Primary tree protection shall include 2" x 4" boards in 8-foot lengths vertically strapped around trunk at 8-inch on center maximum.

3.2 EXCAVATION

- A. Install shoring or other protective support systems to minimize sloping or benching of excavations.
- B. Do not excavate within drip line of trees, unless otherwise indicated.
- C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use air spade to expose roots and flag roots for protection.

- 1. Relocate roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and relocate them without breaking. No roots greater than 2 inches shall be cut during construction activities. Only root pruning methods shall be used for removal and shall be subject to the approval of the Owner.
- 2. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil. Vertical mulching shall be required if soil compaction levels exceed 75% or more than 3 passes by heavy equipment are expected.

3.3 REGRADING

- A. Grade Lowering: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by qualified arborist, unless otherwise indicated.
 - 1. Root Pruning: Prune tree roots exposed during grade lowering. Do not cut main lateral roots or taproots; cut only smaller roots. No roots greater than 2 inches shall be cut during construction activities. Cut roots with sharp pruning instruments; do not break or chop.
- B. Minor Fill: Where existing grade is 6 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.
- C. Moderate Fill: Where existing grade is more than 6 inches, but less than 12 inches, below elevation of finish grade, place drainage fill, filter fabric, and topsoil on existing grade as follows:
 - 1. Carefully place drainage fill against tree trunk approximately 2 inches above elevation of finish grade and extend not less than 18 inches from tree trunk on all sides. For balance of area within drip-line perimeter, place drainage fill up to 6 inches below elevation of grade.
 - 2. Place filter fabric with edges overlapping 6 inches minimum.
 - 3. Place fill layer of topsoil to finish grade. Do not compact drainage fill or topsoil. Hand grade to required finish elevations.

3.4 TREE PRUNING

A. Prune trees affected by temporary and new construction as indicated on the plans. All pruning shall be done under the direction of a certified arborist.

- B. Prune remaining trees, if any, to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by qualified arborist.
- C. Pruning Standards: Prune trees according to ANSI A300.
- D. Cut branches with sharp pruning instruments; do not break or chop.

3.5 TREE REPAIR AND REPLACEMENT

- A. Promptly repair trees damaged by construction operations within 24 hours. Treat damaged trunks, limbs, and roots according to written instructions of the qualified arborist.
- B. Remove and replace dead and damaged trees that the qualified arborist determines to be incapable of restoring to a normal growth pattern.
 - 1. Provide new trees of the same size and species as those being replaced; plant and maintain as specified.
 - 2. Provide new trees of 2-inch caliper size and of a species selected by Engineer the cumulative quantity of which shall match the diameter of the damaged tree.
- C. Aerate surface soil, compacted during construction, 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch diameter holes a minimum of 12 inches deep at 24 inches (on center). Backfill holes with an equal mix of augered soil and sand.
- D. A written guarantee shall be provided to the Town that trees planted in Town as per the contract will thrive for a minimum of two (2) years. The guarantee shall include replacement of trees that the Owner has determined are not thriving. Replacements shall have the same guarantees as the original trees.

3.6 DISPOSAL OF WASTE MATERIALS

- A. Burning is not permitted.
- B. Disposal: Remove excess excavated material, displaced trees, roots, stumps and excess chips and dispose in accordance with Section 02080.

END OF SECTION 02052

SITE CLEARING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions, Division 0 and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY OF WORK

- A. Limits of clearing and grubbing are as indicated on the Drawings. Miscellaneous trash and debris shall be removed and disposed of legally off site. The work covered under this Section of the Specifications includes the following:
 - 1. Removing stumps and roots.
 - 2. Topsoil stripping and stockpiling.
 - 3. Protecting existing trees and vegetation to remain.
 - 4. Establishing the limit of work.
- B. Related Sections include the following:
 - 1. Division 0 Bidding and Contract Requirements
 - 2. Division 1 General Requirements
 - 3. Section 01110 Environmental Protection Procedures
 - 4. Section 02020 Erosion and Sediment Control
 - 5. Section 02050 Tree Protection and Trimming
- C. Work included:
 - 1. The Contractor shall be responsible for clearing and removing trees and limbs, stump removal, grubbing, filling depressions left by grubbing, stripping and stockpiling topsoil, protecting existing trees and vegetation to remain, and disposal.
 - 2. All construction activities must be completed while meeting the requirements of the Appendices of the specifications, including all federal, state, and local permit requirements.

1.3 SUBMITTALS

A. Shop Drawings: Submit in accordance with the Conditions of Contract and Division 1 Specifications Sections.

1.4 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inch in diameter; and free of weeds, roots, and other deleterious materials.

1.5 MATERIALS OWNERSHIP

A. Except for materials indicated to be stockpiled, managed and reused, or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

1.6 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site prior to commencement of tree removal and grading operations.
- B. Comply with governing MassDEP, USDA, and EPA notification regulations before starting site tree removal and grading. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets and walks during siteclearing operations.
 - 1. Do not close or obstruct streets and walks without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
- B. Notify utility locator service for area where Project is located before operations begin.

1.8 SITE CONDITIONS

A. The Contractor acknowledges that he has satisfied himself 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.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction. Prior to construction activities, the limit of work shall be staked in the field by a Registered Land Surveyor. The limit of work shall be marked with the placement of construction fencing and maintained throughout the project. No disturbance is allowed beyond the limit of work line.
- B. Prior to construction provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Locate and clearly flag trees and vegetation to remain or to be relocated as approved by the Engineer.
- D. Locations of existing utilities were taken from the best available information and are approximate only. Contractor shall field locate and verify all utilities and improvements prior to commencement of work under this section. Contractor shall notify "Dig Safe" (1-888-344-7233) and the Town of North Andover DPW to verify the location, depth, and size of the existing site utilities and utility structures prior to the commencement of work under this section.
- E. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
 - 3. Completely remove stumps, roots, obstructions, and debris extending to a depth of 24 inches below exposed subgrade.

- 4. Use only hand methods for grubbing within drip line of remaining trees.
- 5. All debris to be removed from site and properly disposed of.
- B. Fill depressions caused by stump removal and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding 8-inches loose depth, and compact each layer to a density equal to adjacent original ground.
- C. Protect wetland restoration areas and infiltration basins, if used, after the initial vegetation clearing to prevent compaction of soils by other vehicles by placing orange construction fencing along the perimeter.
 - 1. Lightweight construction vehicles shall be used to shape the wetland restoration areas and infiltration basins, if used, to prevent soil compaction. Compacted soils shall be aerated.

3.3 DISPOSAL

- A. Disposal: Remove obstructions, demolished vegetation materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.
- B. Invasive plant disposal shall be undertaken in accordance with the 2014 "Guidelines for Disposal of Terrestrial Invasive Plants" produced by the Connecticut Department of Energy and Environmental Protection and the University of Connecticut.

3.4 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700 – Contract Closeout.

END OF SECTION 02060

SOIL AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1 QUALIFICATIONS

- A. The Contractor shall demonstrate the necessary skills, experience, training, and qualifications to conduct the work as specified herein.
- B. The Contractor shall possess all required licenses, insurance, permits and trained employees to properly execute the work as specified herein.
- C. All personnel involved in the transportation of waste from the site shall have the required skills, experience, training, and qualifications including, but not limited to, Department of Transportation (DOT) and Occupational Safety and Health Administration (OSHA) training.

1.2 EXISTING CONDITIONS

- A. The following documents are available for review and appended to these Technical Specifications.
 - 1. Appendix B Geotechnical Data

It should be noted that THE DATA IN APPENDIX B IS FOR REFERENCE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR THEIR OWN ANALYSES.

B. The Contractor is obligated to review existing environmental assessment reports and manage the soil and groundwater in accordance with applicable state and federal regulations.

1.3 DEFINITIONS

- A. Asphalt, Brick and Concrete (ABC): Asphalt, Brick and Concrete material that is waste from construction or found in fill material during excavation. ABC material found in clean, reusable fill may be reused onsite to the greatest extent possible. All excess ABC generated during construction shall be disposed of offsite at an appropriate, licensed facility that will accept ABC waste.
- B. Area of Excavation: For the purposes of reusing soil on-site, the *area of excavation* is considered to be the approximate area in which the soil was removed provided that area is consistent in soil strata, color, texture, geotechnical properties and has substantially similar visual and olfactory characteristics. Soil returned to the *area of excavation* shall be returned to approximately the same horizontal and vertical location from which it originated provided that it is not placed in an area that differs substantially in physical or chemical characteristics as can be observed and measured during excavation. Soil returned to the area of excavation shall be placed and compacted as specified in the Contract Specifications.

- C. Authorized Excavation: Earth Excavation or "Excavation" consists of removal of materials encountered to the elevations and widths indicated in the Contract Drawings, Specifications, or as directed by the Engineer.
- D. Background: (see Section 1.3.W.1)
- E. Bill of Lading (BOL): A document signed by a waste transporter or the transporter's representative and issued to a waste generator that evidences the receipt of waste to a specified disposal facility or location. BOL is typically utilized as accompanying documentation during transport of Regulated soils. Soils subject to management under 310 CMR 40.0035.
- F. Competent Person: for purposes of this Specification, the term shall mean one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them [29 CFR 1926.32(f)].
- G. Containerized Waste (as defined in 310 CMR 40.0000) means discarded oil and/or hazardous material at a site in drums, tanks, engineered impoundments, or other fabricated containers, including, without limitation:
 - 1. discarded oil and/or hazardous material that was generated at a site as a results of manufacturing industrial, commercial or other process-related activities, and
 - 2. discarded oil and/or hazardous material discovered, managed, generated, or accumulated as part of a response action.
- H. Contaminated Media:
 - 1. Contaminated Debris (as defined in 310 CMR 40.0000) means any debris that contains oil and/or hazardous material associated with a release for which notification is required by 310 CMR 40.0300 and 40.1600.
 - 2. Contaminated Groundwater (as defined in 310 CMR 40.0000) means groundwater containing oil and/or hazardous material at concentrations equal to or greater than a release notification threshold established by 310 CMR 40.0300 and 40.1600.
 - 3. Contaminated Sediments (as defined in 310 CMR 40.0000) means sediments containing oil and/or hazardous material associated with a release for which notification is required by 310 CMR 40.0300 and 40.1600.
 - 4. Contaminated Soil (as defined in 310 CMR 40.0000) means soil containing oil and/or hazardous material associated with a release for which notification is required by 310 CMR 40.0300 and 40.1600.
 - 5. Contaminated Surface Water (as defined in 310 CMR 40.0000) means surface water containing oil and/or hazardous material associated with a release for which notification is required under 310 CMR 40.0300 and 40.1600.
- I. Debris (as defined in 310 CMR 40.0000) means solid material that is a manufactured object, plant or animal matter that is intended for disposal or is otherwise no longer serving its intended use. The term shall include demolition and construction waste, hay,

vegetation, and other organic and inorganic absorbent materials used to contain or absorb releases of oil and/or hazardous material. The term shall not include:

- 1. any material for which a specific treatment standard is provided in 40 CFR Part 268, Subpart D; or
- 2. process residuals such as smelter slag and residues from the treatment of waste, wastewater, sludges or air emission residues.
- J. Demolition and Construction Waste (as defined in 310 CMR 40.0000) means any waste materials and rubble resulting from the construction, remodeling, repair or demolition of buildings, pavement, roads or other structures. Demolition and construction waste includes, but is not limited to, concrete, bricks, lumber, masonry, road paving materials, rebar and plaster.
- K. Disposal shall mean safe and legal reuse, recycling, or disposal off the site in a manner as required to comply with all applicable statutes and regulations.
- L. Hazardous Material as defined 310 CMR 40.0006.
- M. Hazardous Waste:
 - 1. Hazardous waste as defined 310 CMR 40.0006; or
 - 2. Hazardous waste as defined in 40 CFR 261.3.
 - 3. A waste, or combination of wastes, that, because of its quantity, concentration, or physical, chemical, or infectious characteristics may:
 - a. Cause or significantly contribute to an increase in mortality or cause or significantly contribute to an increase in a serious irreversible or incapacitating reversible illness; or
 - b. Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.
- N. Licensed Site Professional and LSP (as defined in 310 CMR 40.0006) each means a hazardous waste site cleanup professional, as defined in M.G.L. c.21A, §19, holding a valid license issued by the Board of Registration of Hazardous Waste Site Cleanup Professionals pursuant to M.G.L. c.21A, §§19 through 19J.
- O. Liquid Waste: materials generated onsite due to work performed and are waste or excess including but not limited to collected groundwater, collected stormwater, non-aqueous phase liquids, Contractor-supplied fuels and fluids, and drummed liquids.
- P. Material Shipping Record (MSR): A document signed by a waste transporter or the transporter's representative and issued to an acceptance facility that evidences that receipt of unregulated soils or waste to a specified disposal facility or location. For the shipment of contaminated soil, urban fill, and dredge materials not subject to management under 310 CMR 40.0035.
- Q. Massachusetts Contingency Plan or MCP: 310 CMR 40.0000

- R. Natural Soils: Natural soil is defined for the purposes of the Contract as unconsolidated sand, gravel, silt and clay, and the organic material which has become part of the unconsolidated soil matrix. For this section only, soil may include broken and fragmented rock.
- S. Peat: A substance of vegetable origin, consisting of roots and fibers, moss, etc., in various stages of decomposition, and found, as a kind of turf or bog. Peat shall be considered natural soil when it is encountered in small amounts (layers 1-foot (304.8 mm) or less in thickness) and when it is impractical to separate the peat from the natural soil or urban fill strata. Otherwise, peat shall be considered a distinctive stratum.
- T. Regulated Soil: Soils requiring management in accordance with 310 CMR 40.0000, and require BOL to document transport. (see Section 1.3.W.3)
- U. Remediation Waste: as defined in 310 CMR 40.0006 means any Uncontainerized Waste, Contaminated Media, and/or Contaminated Debris that is managed pursuant to 10 CMR 40.0030. Remediation Waste does not include Containerized Waste.
- V. Solid Waste (Waste): materials generated on site due to work performed and are waste or excess, including but not limited to asphalt, brick and concrete (ABC) waste, demolition waste, decontamination waste, dredging spoils (dewatered), metal waste, plaster/drywall, plastic waste, rock, rubber waste, sediment, tar waste, trash, vegetation debris, wood waste.
- W. Soil Classification Categories: Unless specifically stated otherwise, terms used in this specification are as defined in the Massachusetts Contingency Plan (MCP), 310 CMR 40.0006. The following definitions and soil classifications apply to these specifications:
 - 1. Background or Unregulated Soil: Any fill or natural soil material which meets the regulatory definition of "background" as defined in 310 CMR 40.0006 may be reused as common fill/ordinary borrow provided it also meets the physical requirements as specified herein and as specified in Section 02200 Earthwork. Suitable soil which does not have any evidence of contamination may be reused within the area of excavation without first performing laboratory analyses. For record keeping purposes soil/fill that meet the definition of background, shall be transported under a Material Shipping Record (MSR). Background means those levels of oil and hazardous material that would exist in the absence of an MCP Disposal Site, including both Natural Background and Anthropogenic Background.

Background soil may also be re-used off-site without restriction provided it is reused in an area where background concentrations are equal to or greater than the site-specific background determined at the off-site location in accordance with DEP Policy WSC#13-500 Similar Soils Provision Guidance (or most recent update). The Contractor is responsible for determining the background levels at the point of excavation. It is also the Contractor's responsibility to identify one or more disposal facilities/locations with background levels appropriate to receive the material to be disposed or reused. It is the Contractor's responsibility to determine these background levels in advance so as to comply with 310 CMR 40.0032(3)(b) and so as not to delay or adversely affect construction operations.

2. Impacted: Any soil or fill material which contains oil or hazardous materials (OHM) at concentrations greater than background levels but less than release
notification thresholds established by 310 CMR 40.0300 and 40.1600. Impacted soil may be reused in the area of excavation or as fill provided it is reused in an area of equal or greater contamination and meets the physical requirements as specified herein and as specified in Section 02200 - Earthwork. Impacted soils requiring off-site transportation and disposal/reuse shall be transported using a Material Shipping Record (MSR).

3. Contaminated or Regulated Soils: Any soil or fill material which contains oil or hazardous materials at concentrations equal to or greater than a release notification threshold established by 310 CMR 40.0300 and 40.1600, except where the presence of the material is consistent with the regulatory definition of "background" as defined in 310 CMR 40.0006.

Any soils which contain either petroleum or chemical odor or visual indications of oil or hazardous materials shall be handled as potentially contaminated soils. Soil/fill that may be contaminated shall be set aside by the Contractor for assessment by the Contractor's environmental professional (LSP) in a secure manner to prevent exposure to humans and the environment and in accordance with 310 CMR 40.0036. Soil/fill that is staged and characterized can be reused within the area of excavation or elsewhere on site provided the material has been tested and has equal or less contamination than the point where it is to be reused and it is not reused beneath a permanent structure such as a building foundation. Any excavated soil/fill material not reused within the area of excavation must be characterized prior to off-site reuse/disposal. After analytical results are available, soil/fill shall be handled in accordance with the type and degree of contamination (if any) present in the soil/fill, and recommendations of the Contractor's LSP.

Contaminated soil that cannot be reused on site shall be reused off-site, recycled, or disposed as a solid waste at an appropriately permitted facility unless it also meets the regulatory definition of hazardous waste as defined in 40 CFR Part 261 or contains detectable asbestos. Contaminated soils requiring off-site transportation and reuse/disposal or recycling shall be transported using a Material Shipping Record (MSR) or Bill of Lading (BOL), as appropriate. Subcategories of Contaminated soil are defined as follows:

- <u>Unlined Landfill Material:</u> Soils that meet all applicable criteria (i.e., COMM 97-001 and/or facility-specific permit requirements) for off-site reuse as daily cover, intermediate cover, or pre-cap contouring material at in-state <u>unlined</u> landfills. Note: per COMM 97-001, sediments may not be re-used as Unlined Landfill Material.
- b. <u>Lined Landfill Material:</u> Soils that meet all applicable criteria (i.e., COMM 97-001 and/or facility-specific permit requirements) for off-site reuse as daily cover, intermediate cover, or pre-cap contouring material at in-state <u>lined</u> landfills.
- c. <u>Asphalt Batch Plant Material:</u> Soils that meet all applicable criteria for recycling at an asphalt batching plant and/or the specific licensing requirements for the proposed recycling facility. Soil that does not meet the applicable COMM 97-001 criteria for Unlined or Lined Landfill Material that is characterized by the following: TPH concentrations in excess of 5,000 milligrams per kilogram (mg/kg), or total SVOC concentrations in excess of 100 mg/kg, or total non-chlorinated VOC concentrations in excess of 10

mg/kg, and total lead concentrations below 3,000 mg/kg and TCLP metal concentrations below applicable hazardous levels. Material classified as Asphalt Batch Plant Material shall be excavated and transported to an asphalt batch plant for recycling. This material cannot be used as daily cover at or disposed of at a Massachusetts Unlined or Lined Landfill.

- d. <u>Out-of-State Non-Hazardous:</u> Soilsthat contain concentrations of contaminants that exceed in-state lined and unlined landfill reuse criteria as well as asphalt batch plant acceptance criteria, but meet the criteria for regional thermal treatment facilities or out-of-state recycling facilities, and are not classified as a Resource Conservation and Recovery Act (RCRA) Hazardous Waste.
- 4. Hazardous Waste: A waste, or combination of wastes, that, because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or cause or significantly contribute to an increase in a serious irreversible or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Also included within the definition of hazardous waste is hazardous waste as defined 310 CMR 40.0006 and 40.CFR 261.3. Hazardous waste as defined in 40 CFR 261.3 is a solid waste that exhibits any of the characteristics of hazardous waste in excess of regulation levels presented in 40 CFR 261, subpart C and/or that is listed in 40 CFR 261, subpart D; that is a mixture of solid and hazardous waste; or that is derived from a listed waste. Subcategories of Class C soils shall be as follows:
 - a. <u>Post-treatment Non-Hazardous:</u> Soils classified as hazardous waste that have been treated on-site to reduce the toxicity characteristic (e.g., for TCLP lead).
 - b. <u>Hazardous:</u> Material determined to contain "listed" or "characteristic" hazardous waste constituents which cannot be readily treated on-site. This material must be transported to an out-of-state approved RCRA Subtitle C hazardous waste disposal or treatment facility under a Uniform Hazardous Waste Manifest.
- X. Special Waste: Any waste that is determined not to be a hazardous waste pursuant to 310 CMR 30.000 and that exists in such quantity or in such chemical or physical state, or any combination thereof, so that particular management controls are required to prevent an adverse impact from the collection, transport, transfer, storage, processing, treatment or disposal of the waste. Asbestos and PCB-contaminated soils/fill are examples of special waste categories. See Specification Section 02076 for Asbestos Cement Pipe requirements.
- Y. Transportation Documentation or Shipping documentation means the document used to identify and accompany soil or waste during transport such as a Material Shipping Record (MSR), Bill of Lading (BOL), or Uniform Hazardous Waste Manifest. Also referred to as a shipping record.
- Z. Unauthorized Over Excavation: Consists of removal of materials beyond indicated elevations and width limits indicated in the Contract Documents without direction of the Engineer. Over-excavation material handling, transportation and disposal, backfilling

and compaction shall be at the Contractor's expense. Over-excavations shall be backfilled and compacted as specified for excavations of the same class, unless otherwise directed by the Engineer

- AA. Unauthorized Excavation: Consists of removal of materials beyond indicated sub-grade elevations or Contract-defined limits as shown in the Contract documents without specific direction of the Engineer. Unauthorized excavation, handling material, transportation and disposal, backfilling and compaction shall be at the Contractor's expense. Unauthorized excavations shall be backfilled and compacted as specified for excavations of the same class, unless otherwise directed by the Engineer.
- BB. Unknown Materials: Any material, that is not readily identifiable as nonhazardous waste, and which has not been previously characterized or encountered during site investigation activities. The Unknown Material classification is to be used in the event that an unexpected, unusual material is encountered for which special handling procedures shall be required in order to handle the material safely. Such wastes include but are not limited to:
 - 1. Unlabelled drums or containers containing material which is not readily identifiable as a non-hazardous substance.
 - 2. Any material, which varies significantly from material previously observed on site and which cannot be readily identified as a nonhazardous.
 - 3. Waste material of unusual color or odor or material with indications of hazardous levels (e.g. exceeding OSHA permissible exposure limits) of contaminants as evidenced on an organic vapor monitor or other similar instrument.

The Owner reserves the right to apply generator knowledge to classify and profile the material as a previously encountered waste or as a known waste. In the event that a material is encountered which the Contractor is uncertain as to its nature, the Owner or their representative shall assess the material with the Contractor and inform the Contractor as to the nature of the material (known or unknown).

- CC. Unregulated Soil: (see Section 1.3.W.1)
- DD. Urban Fill: Fill, also known as urban, or miscellaneous fill, is defined as a mixture of soil and other materials which have been located in the area through man-made processes primarily for the purpose of grading, backfilling or filling in low areas. Material commonly associated with urban fill includes, but are not limited to; coal, glass, brick, ash, wood fragments and other similar granular materials. Urban fill shall not include boulders, ledge, consolidated rock, asphalt, concrete, railroad timbers, rail, cobblestones or any other abandoned building materials.
- EE. Waste Manifests: the hazardous waste shipping/transportation documentation required to ship all hazardous waste and subject to provisions in 49 CFR 172 Subpart C.

1.4 DESCRIPTION OF WORK

- A. General
 - 1. This Section includes furnishing all labor, equipment, materials, and incidentals required to perform all operations in connection with the handling and disposition,

stockpiling, transport, in-project reuse and/or off-site reuse or disposal of excess excavated materials resulting from the construction operations as specified. Inproject reuse shall be defined as material that is reused within the Project, such as approved use of excavated soils as backfill into the excavation trench after installation of new utilities.

- 2. This Section includes proper handling and management of waste materials, including, but not limited to, construction debris, building demolition, municipal waste, boulders, regulated and unregulated soils, ash, rubble, asphalt, brick and concrete (ABC), asbestos containing material, asbestos cement pipe (Section 02076), hazardous materials and empty or crushed drums and/or drum parts.
- 3. Coordinate work with that of all other trades or contracts affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.
- 4. All work shall be conducted in compliance with Contractor-prepared plans as specified in Paragraph 1.7 Submittals of this Section.
- 5. Implementation of the submitted HASP and other applicable includes establishing work zones (e.g., support zone, contamination reduction zone, exclusion zone), preparing a decontamination pad(s) and staging area(s), performing the appropriate environmental monitoring, training and medical monitoring of personnel, coordinating waste disposal and waste characterization as needed, etc.
- 6. The Contractor shall develop, implement, maintain, supervise, and be responsible for all soil management practices during the course of this contract. An OSHA Competent Person, with demonstrated experience in clean and contaminated soil and hazardous waste handling (e.g. L.S.P.), shall be present during all excavation, backfilling, field screening, segregating, handling, and characterization of all soils excavated in the course of completing this contract to ensure that soil is managed in accordance with applicable laws, regulations, and this Section.
- 7. Demobilizing the site, including, but not limited to, removing and disposing of excess or waste soils, rock, solid waste, demolition waste, construction-related equipment and materials used for personnel and equipment decontamination and related waste such as personal protective equipment (PPE), decontamination water/solids, temporary covers, and wash-water storage tanks; disconnection of temporary utilities; and final clean-up to pre-construction conditions.
- 8. The Contractor is responsible for being aware of potential hazards at the site and reviewing all existing information which provides evidence of contamination within the limit of the work.
- B. Soil and Waste Management
 - 1. This Section describes the general parameters and requirements for testing (including field screening and laboratory chemical analysis), excavation, handling, storage, tracking, transport, and in-project reuse or off-site reuse/disposal of soils.
 - 2. In the course of the work, it may be necessary to excavate and handle potentially contaminated soil or hazardous material. The soil or hazardous materials management practices specified herein apply to all soil and/or hazardous materials excavated during the course of this Contract. Contaminated soils and hazardous

materials/hazardous waste shall be managed in accordance with 310 CMR 40.0000 and 310 CMR 30.000.

- 3. The Contractor shall segregate soils during excavation and stockpiling to avoid mixing soils (i.e. topsoil, fill and natural soils shall be segregated, in addition to regulated, unregulated soils, etc.).
- 4. Characterization of soil, and unknown material for disposal/off-site reuse purposes; field screening and soil management/segregation; temporary storage/staging; and characterization (as may be necessary for unknown materials and/or for compliance with receiving facility requirements); and disposal and/or off-site reuse of excavated soil and waste material. All laboratory chemical analyses conducted shall utilize currently accepted U.S. EPA and applicable state agency analytical protocols and procedures.
- 5. The Contractor shall characterize all excavated and stockpiled soil and fill material prior to off-site reuse or disposal. Characterization requirements may vary depending on the source/location of the excavated soil/fill, the site selected to receive soil suitable for off-site reuse, or the disposal facility permits and policies. The Contractor is responsible for final waste characterization and shall determine if any additional waste characterization is required at no additional cost to the Owner.
- 6. Providing and constructing a secure soil staging area sized to adequately segregate soils in accordance with the conditions specified without impeding construction-related activities. The Contractor is to use existing information and obtain additional information as may be needed to minimize the need for a staging area. If a staging area is required to characterize unknown or excess material for any reason, the Contractor is responsible for locating, selecting, preparing and securing the area.
- 7. Excavated soil/fill that is contaminated or may be suspected as contaminated or containing hazardous materials shall be stockpiled and covered prior to characterization and off-site reuse or disposal. Since individual disposal facilities will have different permit conditions and specific pre-characterization data requirements the Contractor is responsible for final soil characterization prior to transport and disposal. The Contractor is hereby made aware that for the purposes of disposal, final soil characterization is the responsibility of the Contractor and costs for securing a staging area and conducting waste characterization shall be incorporated into the Contractor's bid price for construction.
- 8. During construction activities, excavated soil/fill waste shall be field-screeened by the Contractor and either loaded directly for off-site disposal (provided the excavated material is consistent with previously conducted investigations) or stockpiled in a soil/fill waste staging area located by the Contractor and approved by the Owner and Engineer. Stockpiles of soils shall be minimized to reduce the amount of waste material stored onsite. Stockpiled materials that are to be disposed of shall remain onsite for only as long as it would reasonably take to characterize (if not done in advance), load and transport offsite to an approved disposal facility. Soils that are to be re-used as fill material shall be stockpiled and maintained per Section 3.4 Staging Areas.

- 9. Soil suspected of having the characteristics of a hazardous waste or of containing a listed hazardous waste shall not be removed from the excavation except at the direction of the Engineer.
- 10. Soil/fill waste shall not be staged within 100 feet (30.5 meters) of a reservoir, wetland or Area of Critical Environmental Concern or in a 100-year floodplain. Soil/fill waste shall not be staged in the work area over night. Contaminated material requiring additional waste characterization due to waste disposal facility requirements or in order to assess unknown materials, shall be staged securely pending analytical sampling and characterization by the Contractor.
- 11. The Contractor shall reuse excavated soil at the point of origin to the maximum degree possible. Soil/fill which cannot be reused immediately at the point of origin shall either have been pre-characterized for off-site reuse or disposal by the Contractor and directly loaded for off-site transport (provided the excavated soil/fill is consistent in visual, olfactory and field screening characteristics with subsurface investigation conducted prior to construction pursuant to the MCP) or it shall be staged at a location determined and secured by the Contractor pending analytical characterization.
- 12. Excavating soil, fill and waste containing potential asbestos-containing material (e.g., transite board) shall conform to SECTION 02076 ASBESTOS CEMENT PIPE REMOVAL. No off-site staging of asbestos materials or asbestos containing soils shall be allowed except at the direction of the Owner.
- 13. Removing characterized on-site materials for off-site re-use or disposal.
- 14. Placing and grading of certified clean fill (including fill from on-site which is determined to be suitable for re-use). The Contractor is to maximize the in-project reuse of on-site materials by using soil suitable for such reuse prior to importing material on site.
- 15. In the event that a previously uncharacterized, unknown material is encountered the Contractor shall manage the material separately and will temporarily stage the material pending characterization as specified herein.
- 16. All Investigation Derived Wastes are the property and responsibility of the Contractor and are to be disposed of by the Contractor under a Uniform Hazardous Waste Manifest, Material Shipping Record or by a Bill of Lading, as appropriate. The parties understand and agree that any consultant or sub-consultant (at any tier) is not, and has no responsibility as, a generator, treater, storer, transporter, or disposer of hazardous or toxic substances found or identified at the project site, and that the Contractor agrees to assume responsibility for and indemnify and hold any consultant or sub-consultant (at any tier) harmless from the foregoing.
- C. Groundwater Management
 - 1. Management of contaminated groundwater: If groundwater potentially impacted by oil and/or hazardous material (OHM), based on visual or olfactory evidence, is encountered in the course of the work, construction dewatering and discharge permits and groundwater treatment may be necessary depending upon the discharge method(s) and/or location(s) utilized by the Contractor. The Owner and Engineer shall be notified by the Contactor if groundwater potentially impacted by OHM is identified. REFER TO SECTION 02140 DEWATERING.

1.5 RELATED WORK

- A. Section 01024 Measurement and Payment
- B. Section 01350 Health and Safety Plan
- C. Section 01500 Temporary Facilities
- D. Section 02076 Asbestos Cement Pipe Removal
- E. Section 02140 Dewatering
- F. Section 02200 Earthwork
- G. Section 02050 Demolition and Abandonment

1.6 REFERENCES

- A. All work at the site must be performed in accordance with all applicable federal, state, and local regulations, permits and licenses. Comply with applicable requirements of the following standards and those referenced in this Section. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
- B. OSHA regulations (including, but not limited to, 29 CFR 1910.1000, 29 CFR 1926, and CFR 1910.120), 40-hour Occupational Safety and Health Administration (OSHA) training (plus 8-hour refresher training) and all other applicable state and federal regulations regarding health and safety requirements;
- C. The applicable parts of the Code of Federal Regulation (CFR) Title 40: Protection of Environment, pertaining to the Comprehensive Environmental Response and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA), RCRA, and the National Emission Standards for Hazardous Air Pollutants (NESHAPS) as regulated by the U.S. Environmental Protection Agency (U.S. EPA);
- D. Massachusetts Site Assignment Regulations for Solid Waste Facility Regulations 310 CMR 16.000.
- E. Massachusetts Solid Waste Management Facility Regulations 310 CMR 19.00.
- F. State regulations specified in the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000), and Massachusetts General Law 21E Massachusetts Oil and Hazardous Materials Release Prevention and Response Act, and applicable Massachusetts Department of Environmental Protection (MassDEP) guidelines and policies;
 - 1. Massachusetts Department of Environmental Protection, Bureau of Waste Site Cleanup Policy No. WSC-94-400 entitled "Interim Remediation Waste Management Policy for Petroleum Contaminated Soils," dated April 21, 1994.
 - 2. Massachusetts Department of Environmental Protection Bureau of Waste Prevention Policy No. COMM-97-001 entitled "Reuse and Disposal of Contaminated Soils at Massachusetts Landfills," dated August 15, 1997.

- 3. Massachusetts Department of Environmental Protection, Bureau of Waste Prevention Policy No. WSC#-13-500 "Similar Soils Provision Guidance," dated September 4, 2013.
- 4. Massachusetts Department of Environmental Protection, Policy #COMM-15-01 "Interim Policy on the Re-Use of Soil for Large Reclamation Projects," dated August 28, 2015.
- 5. MassDEP Technical Update. Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil (2002);
- G. Department of Transportation (DOT) regulations 49 CFR, and state transportation licenses and permits;
- H. NIOSH/OSHA/USCG/EPA: "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" October 1985, DHHS (NIOSH). Publ. No. 85-1 15;
- I. Department of Transportation training;
- J. U.S. Army Corps of Engineers 404 permit;
- K. General Contractor's license;
- L. National Pollutant Discharge Elimination System (NPDES) Notice of Intent (NOI) to discharge and associated general permits;
- M. Massachusetts Water Resources Authority pretreatment and construction dewatering requirements and permits;
- N. Excavation and/or grading permits;
- O. Special use permits;
- P. Special waste haulers certificate;
- Q. Massachusetts Wetlands Protection Act and associated Order of Conditions;
- R. The Contractor's Soil and Waste Management Plan (SWMP) and Health and Safety Plan to protect the workers and the public.

1.7 SUBMITTALS

- A. The Contractor shall prepare a Work Plan that generally describes the work to be performed under 02080 Part 3 (Execution). The work plan shall include, but not be limited to detailing the submittal and implementation of the following:
 - 1. Soil and Waste Management Plan;
 - a. Dust, Vapor and Odor Control Plan;
 - b. Air Monitoring Plan;
 - c. Equipment and Personnel Decontamination Plan
 - 2. Site-Specific Health and Safety Plan (See Section 01350);

- 3. Dewatering Plan (See Section 02140);
- 4. Stormwater Handling Plan;
- 5. Spill and Discharge Control Plan;
- 6. Asbestos Management Plan (See Section 02076); and
- 7. MCP required reports as necessary (RAM, URAM, status reports, closure reports).

The Soil and Waste Management Plan (S/WMP) shall be submitted at least three weeks prior to the beginning of any intrusive work at the site. All other required plans shall be submitted to the Owner or Engineer and/or their representative for review and approval at least two weeks prior to beginning any intrusive work at the site. Plans shall be consolidated provided the requirements of each plan are fully incorporated therein.

- B. Soil and Waste Management Plan (S/WMP): The S/WMP shall outline measures for sampling, field screening, laboratory analysis, and disposal/ off-site reuse of soils and wastes generated at the Project site. At a minimum, this plan shall address the following:
 - 1. Methods, procedures, and equipment used for excavating, characterizing, segregating, reusing/backfilling, loading, and transporting contaminated soil/solid waste materials encountered during excavation operations;
 - 2. A list of all transporters and receiving facilities, complete with license numbers, permit numbers (as appropriate), contact person, and address and telephone number that the Contractor utilizes for soil management and waste disposal. In addition, a copy of a memorandum of understanding between the Contractor and each disposal facility shall be attached to the Soil and Waste Management Plan. The memorandum of understanding shall detail that the disposal facility agrees to accept a specified quantity of waste as characterized in the contract specifications and detail what if any restrictions may apply. The Contractor shall provide copies of the permits held by each disposal facility which the Contractor plans to use to dispose of non-hazardous solid waste, hazardous waste, PCB-impacted waste and asbestos-containing waste. The transporters shall have adequate financial insurance and liability insurance mechanisms to handle any accidents, and associated third-party compensation;
 - 3. A summary of the history of compliance actions for each receiving facility proposed to be used by the Contractor. The compliance history shall include a comprehensive list of any state or federal citations, notices of non-compliance, consent decrees or violations relative to the management of waste (including remediation waste) at the facility. The Owner reserves the right to reject any facility on the basis of poor compliance history;
 - 4. If hazardous wastes are to be transported, Contractor shall have or obtain a valid EPA identification number to transport hazardous materials and any other permits or licenses as required by federal, state and local laws, regulations, ordinances and procedures.
 - 5. Procedures for securing the staging area, controlling dust and soil/solid waste migration, preventing damage to uncontaminated areas via contaminant migration and for decontaminating vehicles and personnel exiting the staging area;

- 6. The means and methods for decontaminating all equipment and personnel, including provisions for installing an equipment decontamination pad if required or specified.
- 7. Means, methods and equipment for locating and protecting stockpiles.
- 8. Methods and procedures for identifying stockpiled material (e.g., labeling, marking containers) and procedures for identification and tracking;
- 9. Methods, procedures, and equipment used for obtaining the necessary information needed to satisfy the off-site reuse/disposal facility requirements specified herein and/or by the facility;
- 10. Methods, procedures, and equipment proposed for assessing and handling Unknown Materials. The S/WMP shall indicate which laboratory(ies) the Contractor shall utilize for chemical analysis of soil, groundwater and unknown materials.
 - a. An Unknown Materials information sheet shall be developed as part of the Contractor's S/WMP, upon which the Contractor shall record information such as container type, size, and condition; and, any identifying characteristics of the unknown material. The format of the information sheet shall be as accepted by the Owner and/or its representatives;
 - b. The Contractor's plan for notifying the Owner and Engineer in the event that an unknown material as defined in this specification is encountered. The plan shall include the phone numbers and names of the Owner's representative(s) that the Contractor would contact in such an event.
- 11. Provisions for separation of incompatible materials and segregation of different class of soil;
- 12. Procedures for consolidating (i.e., bulking) compatible materials for disposal.
- 13. Procedures for dewatering as well as handling, characterization, storing, treating and disposing of groundwater due to dewatering. Refer to Section 02140 Dewatering.
- 14. Procedures for diverting and handling site stormwater. This would include handling, treatment and discharge of storm water.
- 15. Provisions, procedures and equipment used for control of dust, vapor and odor; including measures to control objectionable dust, vapors, and odors originating from the site (Section 3.7). This shall describe procedures to minimize the creation of dust, and the control of objectionable vapors and odors originating from the site.
- 16. Provisions, procedures and equipment used to monitor air at the site (Section 3.6). This shall include site specific monitoring for potential hazards in the air; including the proposed instrument(s) to be used, the expected hazards (e.g., dust, VOCs), the monitoring frequency, the monitoring locations, and the reporting procedures.
- C. Soil Management/Tracking Documentation:

Prior to off-site disposal or reuse, the Contractor shall provide to the Engineer a letter from the disposal facility indicating that the facility has reviewed the available data relative to the soil/solid waste to be delivered and agrees that the soil/solid waste meets their acceptance criteria. The letter shall be signed by a duly authorized representative of the receiving facility.

Within the time constraints established in state and/or Federal laws and regulations, the Contractor shall submit to appropriate authority(ies) and the Owner, as applicable, Uniform Hazardous Waste Manifests, Material Shipping Records, and/or Bills of Lading (collectively referred to as transportation documentation) for all soils, rock, ACB, asbestos pipe, asbestos containing materials (ACM), hazardous waste and waste disposed or reused of off-site utilizing such documents. Copies of all transportation documentation and all other documents used to track and/or permit off-site transportation of soils or wastes shall be submitted to the Owner and Engineer within ten (10) days of shipment. All transportation documentation shall be signed by the transporter and receiving/disposal facility. The Contractor is responsible for preparation of all transportation documentation, manifests, Bills of Lading, Material Shipping Records, and all other related documents completely and accurately, including LSP Opinion letter and signature as necessary, and prior to submitting them to the Owner and/or its representative for generator review and signature. The Contractor shall be responsible for preparation of LSP opinion letters to disposal facilities and coordinating disposal documentation with all parties. The Owner shall sign any MassDEP Bill of Lading forms where required only after the Contractor has provided the information required for preparation of electronic MassDEP forms. The Contractor shall be responsible for paying for any and all fines associated with inaccurate, incorrect, or improperly completed transportation documentation and all other related documents, including fines resulting from late or untimely submittals.

D. Stormwater Handling Plan

The Stormwater handling plan shall provide provisions to ensure compliance with Section 3.10, other portions of the Contract Documents, and all applicable local, state and federal permits.

E. Quality Control Plan

The Contractor shall prepare a Quality Control plan for the development, implementation, and maintenance of a quality control system to ensure that the specified quality is achieved for all materials and work performed.

F. Spill and Discharge Control Plan (SDCP): The SDCP shall provide contingency measures and reporting responsibilities for potential uncontrolled spills and discharges of contaminated and/or hazardous materials, including, but not limited to: fuels, oils, contaminated groundwater, granular solid waste, leachate, decontamination water, sewage, and other on-site waste materials. In addition to the above listed items, the SDCP shall specifically contain: procedures for containing dry and liquid spills; absorbent material available on site; storage of spilled materials; governmental reporting (i.e., notification) procedures; decontamination procedures; discharges of sanitary or combined sewers into storm drains either by flow handling/bypassing or accidental or unintentional discharge; and procedures for protecting wetlands and surrounding public and private property.

The Spill and Discharge Plan shall indicate the location and quantity of the materials to be staged on site and the basis for the quantities (i.e. indicate the vessel which will be on site containing the greatest volume of oil or hazardous materials). No fuel or oil tanks or drums may be temporarily staged on site unless they are stored within a secondary containment system. Fuel deliveries shall be performed in a designated area which has either secondary spill containment or an impervious surface with absorbent berms located around the point of fuel delivery. The Spill and Discharge Plan shall indicate the location of the fueling area and the nature of secondary containment which the Contractor intends on utilizing.

- 1. Notification Procedures: The Contractor shall prepare in advance of work activities a notification list, complete with phone numbers, addresses, and contact names for all parties to be notified in the event of a spill. This list shall be posted on-site at all times and shall include:
 - a. Owner's designated representatives;
 - b. Owner;
 - c. Fire Department;
 - d. Engineer;
 - e. Massachusetts Department of Environmental Protection (as required per 310 CMR 40.0000). The Owner shall be notified immediately of an uncontrolled spill or discharge. If human health or the environment are potentially threatened, the Contractor shall take immediate action to abate the conditions and notify emergency personnel;
 - f. Appropriate emergency personnel.
- 2. Spill Incident Report(s): In the event of an uncontrolled spill or discharge, a written report detailing each uncontrolled spill or discharge shall include, at a minimum, the cause and resolution of incident, outside agencies involved, and date and time of occurrence. The report shall be submitted to the Owner within 48 hours of the incident. The Contractor shall document all spills on the as-built Drawings and submit the Drawings to the Owner at project completion. The Contractor shall be responsible for remediating any spills or releases of oil or hazardous materials as a result of the Contractor's activities. The site shall be remediated to pre-release conditions at no additional cost to the Owner.
- G. Medical surveillance records, OSHA 40-hour or 8-hour training forms, accident forms, and all other documentation requirements of the Contractor's safety and health program for personnel working on the site (who are subject to exposure to potentially contaminated soil) shall be up-to-date and kept on file at the site. The Contractor shall provide documentation of employee status upon request of the Engineer and/or their representative.

PART 2 - PRODUCTS

2.1 DUST CONTROL

A. Dust suppression may be achieved by applying controlled amounts of water or dust suppression chemicals to the project site, and through covering of soil stockpiles, etc. Dust suppression shall be carried out in accordance with the approved SWMP.

2.2 SPILL CONTROL

A. At a minimum, the Contractor shall maintain on-site absorbent pads, booms and absorbent materials in sufficient quantity to address a release of fuel oil, hydraulic oil or other OHM that the Contractor intends to use or store on site, including fuel oil and hydraulic oil that is used within earth moving equipment. The quantity of spill containment materials maintained on site shall be sufficient to respond to a catastrophic release from the vessel containing the greatest quantity of oil or hazardous material on-site.

2.3 SOIL MANAGEMENT/TRACKING DOCUMENTATION

- A. Provide completed Bills of Lading (BOLs), Material Shipping Records (MSRs), manifests, certificates of disposal, weight slips and all other documentation relative to disposal, reuse, treatment, recycling or other means of off-site use of soil and waste materials.
- B. Provide appropriate equipment and materials to protect and delineate stockpiles as necessary.

PART 3 - EXECUTION

3.1 GENERAL

- A. All work in this section will be performed in accordance with the Contractor's Work Plan, S/WMP, Site-Specific HASP and any other site specific plans/reports that have been approved by the Owner and Engineer.
- B. The primary concern of the Contractor in the excavating, handling, sampling, bulking, and on-site storage of soil/solid waste and/or drummed material (if encountered) will be to protect the health and safety of the site workers, the public, and the environment.
- C. The Contractor shall keep a copy of the Health and Safety Plan (HASP) on site during all operations and shall conduct daily health and safety meetings. Failure to keep a copy of the HASP on-site, or any other breach of the Contractor's Plan, may be cause for stopping work at the cost of the Contractor. Delays caused by the Contractor's failure to comply with the health and safety regulations or any health and safety plan shall not entitle the Contractor to recover any additional costs or time lost. The Contractor shall not be allowed to resume activities until corrective measures are accepted by the Engineer and/or their representative and implemented.

D. The Contractor shall reuse geotechnically suitable excavated material prior to using imported backfill to reduce the volume of material to be reused/disposed off-site. Imported backfill shall be used only as accepted by the Engineer. Urban fill soils and roadway base/subbase shall be re-used to the maximum extent before reusing naturally occurring soils. If off-site disposal is required, natural soils shall be preferentially disposed or reused. Contamination shall not be exacerbated as a result work activities.

3.2 SOIL/FILL WASTE CHARACTERIZATION

Soil and fill material shall be classified based on the criteria established in the accepted SWMP.

- A. Initial Characterization of Soil/Fill Waste Material: A summary of existing conditions and investigation findings performed by the Engineer during design, including a summary of analytical results, shall be available to the Contractor.
- B. The Contractor shall review all the existing conditions information supplied by others. The Contractor shall use the information and shall either perform independent sampling and characterization of soil/fill waste strata to be encountered during construction in advance of excavation such that excavated soil or wastes can be segregated and directly transported to an appropriate facility or the Contractor shall make the necessary arrangements to secure a staging area(s) suitable for storing soil stockpiles or wastes pending analyses, at no additional cost to the Owner. No staging of asbestos materials or asbestos containing soils shall be allowed except at the direction of the Owner. The Contractor shall identify known or suspected areas where hazardous materials may be encountered, including but not limited to asbestos, PCB, lead-based paint.
- C. Soil shall be preliminarily segregated based on the Soil Classification Categories detailed in Section 1., except as indicated below.
 - 1. <u>Potential Asbestos Containing Material (PACM).</u> If soil/fill waste suspected of containing asbestos is encountered during excavation, the Contractor shall immediately contact the Engineer to discuss the nature and extent of the PACM and to assess potential hazards and appropriate handling procedures. Prior to handling and removing the PACM, MassDEP shall be contacted for approval. Discovery and management of PACM shall be documented in the S/WMP. Evidence of PACM includes but is not limited to the presence of suspect asbestos-containing building debris such as cementitious (transite) piping, vinyl floor tiling, roofing paper or paper-like insulation materials or any other suspect asbestos containing material observed in the soil/fill waste. Following MassDEP approval, such soil/fill waste shall be segregated and stockpiled pending confirmatory analysis to determine appropriate disposal requirements.
 - 2. <u>Unknown Material.</u> If unknown material is encountered during excavation, the Contractor shall immediately contact the Owner and Owner's representative to discuss the nature and extent of the unknown material and to assess potential hazards and appropriate handling procedures. Prior to handling and removing the unknown material from the excavation area, the Contractor and Owner and/or its representatives, shall visually assess the material and its potential hazards. Drums shall be assessed to determine whether they are leaking, corroded, pitted, bulging (evidence of reactive waste), crushed, empty, filled-in-place. Crushed, empty,

and/or skeletal parts of drums shall be handled as solid waste, as specified. Note any evidence of staining or olfactory indications of contamination. The Contractor shall record any identification or markings on the drummed material(s). Discovery and management of unknown materials shall be documented as required in the SWMP.

D. Final Waste Characterization: Final waste characterization shall be the responsibility of the Contractor. The Contractor shall be responsible for determining the characterization requirements of each disposal facility in advance to facilitate timely off-site removal and to adequately estimate the disposal costs. The Contractor shall perform additional segregation based on disposal requirements. Disposal or off-site reuse of the material shall depend on sampling and characterization analytical results. At the request of the Engineer or Owner, the Contractor shall provide a split sample. The Contractor shall perform or observe all sampling and shall provide notice in advance to the Engineer so that the Engineer may observe the sampling procedure.

Stockpiles within the staging area shall be sampled and characterized within a timely manner so as not to impede construction activities or preclude the reuse of soil/fill on site. If soil/fill cannot be reused on site due to the Contractor's delay in sampling material, the Contractor shall dispose of the soil/fill at no additional cost to the Owner including the additional cost of imported fill material used in its place to meet project requirements.

3.3 SOIL/SOLIDS WASTE MANAGEMENT

- A. The Contractor shall reuse, recycle or dispose of all excess soil and wastes resulting from excavation activities in accordance with federal, state and local regulations and these specifications, as well as all other state laws through which the waste material is being transported.
- B. The Contractor shall obtain receipts of disposal for disposed wastes as applicable.
- C. The Contractor shall be responsible for preparing and keeping in proper order all waste manifests, BOLs, MSRs, and shall designate one person who shall be made available to sign all transportation documentation. The Contractor shall be responsible for obtaining the generator's signature and all other signatures required for the proper completion of the transportation documentation. The Contractor shall allow a minimum of five (5) working days from the date of the submittal for any documents requiring the signature of the Owner. The transportation documentation shall document the handling of the excess excavated soil or waste from the time it is generated until the time it is properly reused or disposed.
- D. The Contractor shall be responsible for obtaining all federal, state, and local permits and variances to allow transport of materials and wastes on public roadways.
- E. Transportation of wastes shall be in compliance with any relevant federal, state and local requirements, and such as to assure that waste material is not released during transit.

- F. Soil and fill material that is managed under a Utility-Related Abatement Measure (URAM) Plan pursuant to the MCP, and which is staged off-site may be re-used within fourteen (14) calendar days of excavation. Any material which is suitable for re-use as ordinary borrow, based on analytical results and could have been placed on site, but was not, due to Contractor delay (i.e. analytical results were not available within 10 days following excavation) will be disposed in accordance with the applicable regulations by the Contractor at no cost to the Owner.
- G. Soil and fill material that is managed under a URAM Plan pursuant to the MCP, which is staged off-site and which is determined at the staging area to be characteristically hazardous may be treated (stabilized) within the "Area of Contamination" only and must be reused with 14 days or disposed of within ninety (90) calendar days of excavation. No treatment may occur at the staging area. Pursuant to the MCP and RCRA, hazardous Remediation Waste (e.g., Hazardous soils) shall be removed from the site within 90 days. All other Remediation Waste (e.g., Contaminated soils) shall be removed within 120 days unless exceptions identified at 310 CMR 40.0031(7) apply.
- H. Contaminated and Hazardous excavated soils shall be completely covered and secured in accordance with this. Soils exhibiting evidence of potential contamination including but not limited to odors and/or staining shall be covered prior to characterization and off-site reuse or disposal.
- I. The Contractor shall be responsible to inform the Owner if hazardous waste disposal will not be performed within 90 days of hazardous waste characterization. This notification shall take place a minimum of 30 days prior to the 90-day deadline. No hazardous waste stockpiled at the site shall remain on site more than 90 days after it is characterized. In accordance with 310 CMR 40.0031, all other Remediation Waste shall not remain on site or temporary off-site storage location more than 120 days from initial date of generation.
- J. Transporters of solid wastes that include, but are not limited to, contaminated soil/fill (including OHM-contaminated soil), construction and demolition debris non-hazardous laboratory wastes, bottles, tires, metal parts, tree stumps, brush, and grass cuttings will utilize trucks or dumpsters specifically designed to ensure that material, dust, or liquid is not released in transit. No truck shall be allowed to exit the site until all free liquids are drained from soil being transported off-site. Moisture content of the soil/waste shall be reduced by the Contractor, to or below the maximum acceptance limits required by the disposal facility. Material shall be covered at all times. The vehicle in which the waste is transported shall be driven directly to the intended destination without any stops or detours in between, except those necessary in response to road conditions, vehicle service needs, or emergencies. Discharge or release of material during transport shall be immediately reported to the Owner. Transporters shall clean up any discharge that occurs in transit, at the Contractor's expense.
- K. Manifesting of solid waste shall be required and shall include at a minimum: vehicle identification; date of loading and disposal; tonnage, as measured at the disposal site; and signature of the Owner and/or its representative, transporter, and disposal facility's representative. Transportation of the wastes shall be accompanied by the appropriate manifests such as a MassDEP Bill of Lading, as required in the Code of Massachusetts Regulations (CMR) 310 CMR 40.0030, a Material Shipping Record or by a Uniform

Hazardous Waste Manifest. The original shall be returned to the Owner, and/or their representative, within ten (10) working days of disposal.

3.4 STAGING AREAS AND STOCKPILING

- A. Prior to disposal, the Contractor shall maintain segregated excess excavated soil and waste stockpiles in conformance with all applicable federal, state and local waste disposal regulations. No staging of asbestos materials or asbestos containing soils shall be allowed except at the direction of the Owner.
- B. The Contractor's staging area shall be large enough to store equipment, materials and all stockpiled soils. The Contractor shall protect the staging area from contamination due to excavating, handling, storing and disposing of hazardous materials.
- C. Stockpiled soils determined to be Contaminated or Hazardous, as described herein, shall be securely covered at the close of each day and continuously when not being added to or otherwise being handled by the Contractor. Stockpiles shall also be covered at times as directed by the Engineer.
- D. Stockpiles of soils that are known or suspected to be hazardous within the soil staging areas shall be placed on a 20-mil HDPE liner/filter fabric and bermed to minimize the potential for contamination release. Each soil category shall be staged in separate areas with barriers to keep different soil types from mixing. Waste characterized as RCRA hazardous waste or other Hazardous soils shall not be stored on site for a period greater than ninety (90) days. All other waste, including Unregulated or Contaminated soils, must be disposed of off-site within 120 days of excavation. At the end of each working day, contaminated soils will be covered with 10-mil polyethylene to minimize the potential for release of contaminants.
- E. Covers on stockpiles of soils that are known or suspected to be hazardous shall be secured with tires, ropes, anchors or equivalent material. The cover system shall be capable of resisting actual wind gusts at the site, with a minimum wind capacity of 40 miles per hour. The stockpile covers shall be installed and secured at the end of each working day and at all times when earthwork is not taking place on site. Stockpile covers shall be immediately re-covered should wind forces expose any of the excavated materials. Failure to adequately protect the stockpiles may result in non-payment.
- F. Stockpiles are to be segregated based on visual, olfactory, and field screening results. Similar material may be stockpiled together. Each stockpile must be clearly separated from adjacent stockpiles.
- G. Stockpiles will be clearly designated by a sign post or marker which can be crossreferenced with samples collected from the pile for characterization purposes. The signs/markers are not to be moved, except by authorized personnel and not until the soil is ready to be either reused on site or loaded for off-site disposal.
- H. Unknown, potentially hazardous soils/debris and drummed materials encountered during the project shall be located in a separate bermed location. The Contractor's Soil and Waste Management Plan shall provide construction details of the dimensions and protective measures proposed for the staging area(s). The construction details and

protective measures are subject to the approval of the Owner and/or its representatives. The Contractor shall select the area to facilitate handling of the material and to minimize interference with other ongoing construction activities. The Owner or Engineer must agree with the location prior to construction. In the event that excavation is conducted near storm water drainage basins or inlet manholes, the Contractor must protect the drainage structures with filter fabric or provide similar protection to prevent sediment loading and migration of contaminated soils and sediments.

- I. If the soil storage area consists of an unimproved or otherwise pervious surface, and soil to be stockpiled is known or suspected to be contaminated, the Contractor shall install a lining of 6-mil (or greater) polyethylene, to protect the soil from the potential of intermixing with existing subsurface soils.
- J. Stockpiles shall be no greater than 250 cubic yards in volume. If space constraints, etc. make it infeasible to maintain separate stockpiles of soils to 250 cubic yards, the Waste Management Plan shall include a map with the locations of the composite samples for each stockpile shall be provided to the Resident Engineer prior to the submittal of the samples to the off-site analytical laboratory. This will allow any portion of the stockpile, which came back as contaminated soil to be properly segregated and managed separately
- K. Stockpiles shall be established and maintained as per EPA requirements under the Construction General Permit Section 2.1.2.4. Requirements include the following.
 - a. Locate the piles outside of any natural buffers and physically separated from other storm water controls;
 - b. Protect from contact with storm water (including run-on) using a temporary perimeter sediment barrier;
 - c. For all soils, provide cover or appropriate temporary stabilization to minimize sediment discharge and to contain and securely protect from wind; nevertheless, the Contractor shall provide cover for any stockpiles containing contaminated soils as specified herein;
 - d. Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any storm water conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water; and
 - e. Unless infeasible, contain and securely protect from wind.

3.5 HAZARDOUS WASTES

A. Transporters of hazardous wastes shall be in conformance with Code of Federal Regulations (CFR) 40 CFR, Part 171, all other federal laws and regulations and 310 CMR 30.400, and all other state laws through whose boundaries the waste material is being transported. The transporter shall provide copies of its EPA identification number, Massachusetts transporter's license, and proof of driver training in transporting hazardous waste.

- B. The disposal site shall be in conformance with 40 CFR, Part 264 and relevant laws of the state in which the facility is located. The Contractor shall provide copies of the disposal facility's EPA and state treatment and disposal permit.
- C. Manifesting of hazardous wastes shall be in conformance with 40 CFR, Part 264, Subpart E, 310 CMR 30.310 and 310 CMR 30.405.
- D. Actual quantities which are subject to unit rates shall be tabulated by the Contractor and verified by the Engineer on a daily basis. The Contractor shall not be reimbursed for unit rate work performed without the prior approval of quantities by the Engineer.

3.6 EQUIPMENT AND PERSONNEL DECONTAMINATION

- A. Equipment and personnel decontamination facilities shall be provided by the Contractor when hazardous materials are expected to be encountered and handled onsite. Equipment and personnel decontamination area(s), conforming with the Contractor's HASP and these Specifications, will be constructed in such a manner to protect existing site surfaces, materials, and structures from contamination. The equipment decontamination area(s) will be sized adequately to provide for the decontamination of the largest piece of equipment to be decontaminated. Filter fabric will be placed over an impermeable liner to protect the liner from rips, punctures, or tears from traffic and heavy equipment.
- B. The Contractor shall establish a site-specific decontamination protocol and decontamination areas for personnel and equipment utilized at the subject site. Personnel and equipment decontamination shall be conducted in compliance with the HASP.
- C. The decontamination protocol shall include (i) the means, methods, and materials for the proposed decontamination procedures; (ii) the procedures employed to contain and store the wash or rinse liquids/sludges; (iii) procedures used to sample, analyze, and characterize the contaminated wash or rinse liquids/sludges; (iv) procedures to contain or clean contaminated equipment and PPE; and (v) the procedures for handling and disposing of solid wastes generated from site decontamination activities. All sample analysis shall be completed by a certified laboratory. The Contractor shall be responsible for the cost of this analytical work. The Contractor shall submit a copy of the analytical results and laboratory certifications to the Owner for review prior to proceeding with disposal. The Contractor shall be responsible to properly manifest and dispose of all residual wastes generated from on-site activities in conformance with federal, state, and local environmental and transportation regulations. The Contractor shall be responsible for the manifests and procedures to be used to package and dispose of contaminated solid wastes, wash, or rinse liquids at an EPA or state-approved treatment or disposal facility. The Contractor shall be responsible for any releases from site or decontamination activities due to its work, and will remediate any release for which the Contractor is responsible to pre-existing conditions at the Contractor's expense.
- D. Provisions for collecting decontamination water will be incorporated into the maintenance of the decontamination pad and will include placing an impermeable liner over a sloped surface such that water is directed, if necessary, into an area for

subsequent pumping to 55-gallon drums or other appropriate tankage. Following completion of the work, the wash water shall be characterized by the Contractor and disposed off-site, in accordance with federal, state, and local regulations.

3.7 ENVIRONMENTAL FIELD MONITORING / DUST CONTROL

- A. The air monitoring program is to be designed to protect public health and the environment from the potential generation of dust and contaminant release during work. All personnel shall be made aware of the potential hazards and be informed of air monitoring information by the Contractor.
- B. Dust control measures shall be implemented by the Contractor during all soil handling operations, loading and transport of waste material from the site in accordance with the Contractor's Dust Control Plan.
- C. Air monitoring shall occur when excavating or handling soils that are known or suspected to be hazardous or contain OHM. The Contractor shall keep accurate documentation of all air monitoring, which will be made available to the Engineer or Owner upon request.
 - 1. At a minimum, the air monitoring shall include daily monitoring and documentation of one upwind, and two downwind conditions during periods of activity on the site and when there is a potential for dust being generated on the site. The air monitoring information including air monitoring in the vicinity of all site activities shall also be utilized for establishing levels of personal protection measures in the Contractor's Site Specific Health and Safety Plan. The Contractor shall submit his/her air quality monitoring program for review and approval prior to commencement of site activities.
 - 2. Air monitoring shall include headspace analyses in a jar or plastic bag performed using a portable photoionization detector or other appropriate instrument for the anticipated conditions. The Contractor shall be responsible for properly calibrating the instrument each day and recording the calibration in a daily log which shall include the following information:
 - a. Name of device or instrument calibrated.
 - b. Date of calibration.
 - c. Results of calibration.
 - d. Name of person performing the calibration.
 - e. Identification of the calibration gas.
 - 3. The Contractor is responsible for providing fully charged instrument(s) at the start of each work day.
 - 4. When applicable, field screening samples shall be taken from numerous locations within the excavation. Samples shall be taken from any area that appears to be visibly contaminated or where an odor is noted.
- D. If there are indications of contamination, the frequency of air monitoring will be determined by an Industrial Hygienist or competent environmental health professional. The Contractor's Site Health and Safety Officer and Superintendent will be responsible

for assuring that monitoring is conducted in an appropriate manner, and that work practices, engineering controls and/or Personal Protective Equipment are proper for the conditions.

- E. Dust shall be controlled during excavation of soil/fill waste material to limit potential spread of contaminants and potential exposure of contaminants to workers and the public.
- F. During construction, real-time dust monitoring shall be conducted under windy and/or excessively dry working conditions or when directed by the Engineer. The monitoring shall consist of total dust testing using MIE, INC. MINIRAM PDM-3 DUST MONITORS, or like instruments. The total dust criteria at the site shall conform to the requirements of the HASP. Should fugitive dust quantities exceed 20 percent of the ambient level or action levels indicated within the HASP, the Contractor shall perform additional measures to reduce the total dust concentrations.
- G. Nuisance dust levels shall be reduced by pre-wetting the surface soils and by establishing and maintaining clean access roads. The Contractor's Dust, Vapor, and Odor Control Plan shall describe the procedures and materials to minimize dust. At a minimum, the Contractor shall provide clean water, free from salt, oil, and other deleterious materials.
- H. Areas of exposed earth to be excavated shall be lightly sprayed with water before excavation if there is potential for nuisance dust generation. Additional water spray may be utilized only when any indication of excessive dust is observed. To the extent feasible, the Contractor shall minimize the use of water within the limits of excavation.
- I. Unimproved access roads shall be sprayed with water on a regular basis to minimize the generation of dust.
- J. All containers temporarily storing waste material shall be covered at all times except as necessary to place waste material into the container. The Contractor shall monitor the covers daily to ensure the covers are in place and effectively eliminating the generation of dust and make appropriate notes in the site log.

3.8 VAPOR AND ODOR CONTROL

The Contractor shall provide the materials and labor to control objectionable vapors and odor in accordance with the Contractor's SWMP. The Contractor shall limit the exposure area and shall cover the exposure area with synthetic reusable covers, lime, foam suppressants, or other methods to reduce off-site odors to acceptable levels. The Contractor shall not use soil suitable for on-site reuse as cover to control vapor and odors.

3.9 BULKING

Following characterization and compatibility testing of waste material, the Contractor shall place compatible materials into common containers to reduce transport and disposal costs, when practicable and with the approval of the Engineer. In addition, materials that are improperly contained shall be transferred into the appropriate containers. Drums and containers used during this project shall meet the appropriate DOT, OSHA, and U.S. EPA

regulations for the materials contained. The Contractor shall describe the bulking procedures in the Soil and Waste Management Plan.

3.10 CONTAMINATED LIQUIDS

The Contractor shall collect and properly dispose of contaminated liquids and other liquids generated or encountered on site during construction. Contaminated liquid sources include decontamination water, and drummed liquids encountered during excavation. The Contractor shall be responsible for treating and disposing of contaminated groundwater as required by applicable regulations and SECTION 02140 DEWATERING.

3.11 STORMWATER CONTROL

The Contractor shall protect all work from erosion while onsite. The Contractor shall divert all stormwater from work areas that may contain oil or hazardous materials (OHM). Stormwater that may contact OHM, polychlorinated biphenyls (PCBs), lead, asbestos or other types of impacted soil shall be collected within the immediate area of the contact, treated (as determined by sampling and testing) and disposed of in accordance with all local, state and federal regulations. Stormwater that is collected, stored onsite and sampled shall be tested and characterized for determining proper transportation, disposal and/or discharge in accordance with SECTION 02140 DEWATERING.

3.12 BACKFILLING AND COMPACTION

Excavated areas shall be backfilled with appropriate backfill material (including excavated material suitable for reuse and, when necessary, imported off-site material) as specified in SECTION 02220 - EARTHWORK.

3.13 CLEANUP

During the course of the work, the Contractor shall keep the Site and his operations clean and neat at all times. He shall dispose of all residue resulting from the site clearing operations; and at the conclusion for the day's Work, he shall remove and haul away any surplus materials, lumber, equipment, temporary structures, and any other refuse remaining from the site clearing operations and shall leave the entire site in a neat and orderly condition.

Material Type	Pre-Approval	Testing/	Transportation	Proposed Receiving
	by Receiving Facility	Analysis	Documentation	Facility/Facilities
Asbestos Containing	Required	Not required	WSR	
Material (ACM)				
Asbestos Cement Pipe (ACP)	Required	Not required	WSR	
Unregulated Soils	Required	Required	MSR	
Impacted/Regulated Soils	Required	Required	BOL	
Hazardous materials	Required	Required	HWSM	
Catch basin cleanings	Required	Required	WSR	
Street Sweepings	Required	Not required	WSR	
Contaminated Dewatering	Required	Required	BOL	
liquids				
Uncontaminated	Required	Not required	Not required	
dewatering liquids				
Sanitary Sewerage	Not required	Not required	Not required	
Asphalt, Brick and	Not required	Not required	MSR, MassDEP	
Concrete Material (ABC)			notification form if	
			crushed	
Construction Debris	Not required	Not required	Not required	
Vegetation	Not required	Not required	Not required	
Municipal Solid Waste	Not required	Not required	Not required	
Recyclable Materials	Not required	Not required	Not required	

Sample Waste Stream Disposal Summary Table

END OF SECTION 02080

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SECTION 02101

SITE INVESTIGATION

PART 1 – GENERAL

1.1 SITE CONDITIONS

A. The Contractor acknowledges that he has satisfied himself 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.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 02101

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SITE INVESTIGATION 02101-2

SECTION 02140

DEWATERING AND DISCHARGE

PART 1 - GENERAL

1.1 SUMMARY

- A. This section shall only apply to specific areas where dewatering activities are required for construction or and repair activities and approved by the Engineer.
- B. This section includes the following:
 - 1. Design, furnish, operate, maintain, and remove temporary dewatering systems to control groundwater and surface water to maintain stable, undisturbed subgrades, and permit work to be performed under dry and stable conditions. Work to be done as part of dewatering includes, but is not limited to:
 - a. Lower the groundwater level.
 - b. Lower hydrostatic pressure.
 - c. Prevent surface water from entering the excavation during construction.
 - 2. For application within temporary earthwork support, the groundwater within the excavation area shall be lowered to at least 2 feet below the lowest excavation levels as specified and as indicated.
 - 3. Common dewatering methods include, but are not limited to, localized sump pumping, bypass pumping, deep wells, well points, vacuum well points or any combinations thereof.

1.2 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section, and:
 - 1. Section 02020 Erosion and Sediment Control
 - 2. Section 02200 Earthwork
 - 3. Section 02160 Temporary Excavation Support Systems
 - 4. Section 02273 Geotextile Filter Fabric

1.3 SUBMITTALS

A. Shop Drawing: Submit the following in accordance with Section 01300 - SUBMITTALS:

- 1. Qualification of the Contractor's dewatering specialist's or firm's qualifications a minimum of two (2) weeks prior to execution of any dewatering. The submittal shall include, but not be limited to:
 - a. Qualifications of specialist's or firm's MA Registered Professional Engineer as specified in Paragraph 1.4 B.
 - b. Qualifications of specialist's or firm's field representative, as specified in paragraph 1.4 B, who shall oversee the installation, operation and maintenance of the dewatering system.
- 2. Submit a dewatering plan at least two weeks prior to start of any dewatering operation. Do not submit design calculations. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:
 - a. Dewatering plan and details stamped and signed by a Massachusetts Registered Professional Engineer.
 - b. Certificate of Design: Refer to Section 01300 for form.
 - c. A list of equipment including, but not limited to, pumps, prime movers, and standby equipment.
 - d. Detailed description of dewatering, schedule, maintenance, and system removal procedures.
 - e. Monitoring plan and details, including, but not limited to, locations of observation wells, and geotechnical instruments such as settlement markers (reference points on structures) and piezometers, and frequency of reading the monitoring devices.
 - f. Erosion/sedimentation control measures, and methods of disposal of pumped water.
 - g. List of all applicable laws, regulations, rules, and codes to which dewatering design conforms.
- 3. A modified dewatering plan within 24 hours, if open pumping from sumps and ditches results in boils, loss of fines or softening of the ground.

1.4 QUALITY ASSURANCE

A. Provide in accordance with Section 01400 and as specified.

- B. Employ the services of a dewatering specialist or firm having the following qualifications:
 - 1. Have completed at least five (5) successful dewatering projects of equal size and complexity and with equal systems within the last five (5) years.
 - 2. Retain the services of a Registered Professional Engineer (in the state of Massachusetts) having a minimum of five (5) years experience in the design of well points, deep wells, recharge systems, or equal systems.
 - 3. Retain the services of a field representative having a minimum of 5 years experience in the installation of well points, deep wells, recharge systems, or equal systems.
- C. If subgrade soils are disturbed or become unstable due to dewatering operation or an inadequate dewatering system, notify the Engineer, stabilize the subgrade, and modify system to perform as specified at no additional cost to the Owner.
- D. Notify the Engineer immediately if any settlement or movement is detected on adjacent structures. If the settlement or movement is deemed by the Engineer to be related to the dewatering, take actions to protect the adjacent structures and submit a modified dewatering plan to the Engineer within <u>24 hours</u>. Implement the modified plan and repair any damage incurred to the adjacent structures at no additional cost to the Owner.
- E. If oil and/or other hazardous materials are encountered after dewatering begins, immediately notify the Engineer.

1.5 PROJECT/SITE CONDITIONS

A. Subsurface Conditions: Refer to the Contract Documents for available information.

1.6 PERMITS

A. Contractor shall be responsible for the preparation, submittal and approval of all required stormwater, drainage and groundwater discharge or construction permits and plans, such as NPDES Construction Permit (if required), the development of site specific SWPPP plan, and adherence to all permits provided within the specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide temporary portable dam system, as necessary.
- B. Provide casings, well screens, piping, fittings, pumps, power and other items required for dewatering system.
- C. Provide sand and gravel filter around the well screen(s). Wrapping geotextile fabric directly around the well screen shall not be allowed.

- D. When deep wells, well points, or vacuum well points are used, provide pumping units capable of maintaining high vacuum and handling large volumes of air and water at the same time.
- E. Provide and store auxiliary dewatering equipment, consisting of pumps and hoses on the site in the event of breakdown, at least one (1) pump for every three (3) used.
- F. Provide and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.
- G. Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.
- H. Provide cement grout having a water cement ratio of 1 to 1 by volume for abandonment of dewatering wells.

PART 3 - EXECUTION

3.1 EXECUTION

- A. Execution of any earth excavation, installation of earth support systems, and dewatering shall not commence until the related submittals have been reviewed by the Engineer with all Engineer's comments satisfactorily addressed and the geotechnical instrumentation installed.
- B. Furnish, install and maintain dewatering system in accordance with the dewatering plan.
- C. Carry out dewatering program in such a manner as to prevent undermining or disturbing foundations of existing structures or of work ongoing or previously completed.
- D. Do not excavate until the dewatering system is operational.
- E. Unless otherwise specified, continue dewatering uninterrupted until all structures, pipes, and appurtenances below groundwater level have been completed such that they will not be floated or otherwise damaged by an increase in groundwater elevation.
- F. Discontinue open pumping from sumps and ditches, if such pumping is resulting in boils, loss of fines, softening of the ground, or instability of the slopes. Modify dewatering plan and submit to the Engineer at no additional cost to the Owner.
- G. Where subgrade materials are disturbed or become unstable due to dewatering operations, remove and replace the materials in accordance with Section 02200 at no additional cost to the Owner.
- H. Dewatering Discharge:
 - 1. Install and monitor recharge systems when specified and/or indicated and in accordance with the submitted dewatering plan.

- 2. Install sand and gravel filters in conjunction with well points and deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
- 2. Transport pumped or drained water to discharge location without interference to other work, damage to pavement, other surfaces, or property.
- 3. Provide separately controllable pumping lines.
- 4. The Engineer reserves the right to sample discharge water at any time.
- 5. Immediately notify the Engineer if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.
- 6. Turbidity levels for dewatering discharge shall not exceed 40 NTUs and shall comply with the Conservation Commission Order of Conditions, provided in Appendix C.
- I. Install and maintain erosion/sedimentation control devices at the point of discharge as indicated or specified and in accordance with the dewatering plan.
- J. Removal:
 - 3. Do not remove dewatering system without written approval from the Engineer.
 - 4. Backfill and compact sumps or ditches with screened gravel or crushed stone wrapped with geotextile fabric in accordance with Sections 02200 and 02273.
 - 5. All dewatering wells shall be removed upon completion of the work, and completely backfilled with crushed stone.

3.2 CONTRACT CLOSEOUT

A. Provide in accordance with section 01700.

END OF SECTION 02140

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SECTION 02160

TEMPORARY EXCAVATION SUPPORT SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - 1. Design, furnish and install temporary excavation support systems as required to maintain lateral support, prevent loss of ground, limit soil movements to acceptable limits and protect from damage existing and proposed improvements including, but not limited to, pipelines, utilities, structures, roadways, and other facilities.
 - 2. Common types of excavation support system include, but are not limited to: singular or multiple stages comprised of cantilevered or internally braced soldier piles and lagging, steel sheetpile wall, timber sheetpile wall, trench box, or combinations thereof. Trench box temporary excavation support system is only acceptable for pipe or utility trench excavations. Temporary unsupported open cut excavation with stable sloping sides is allowed where applicable.
 - 3. Wherever the word "sheeting" is used in this section or on the Contract Drawings, it shall be in reference to any type of excavation support system specified except trench box.
 - 4. Construction of the temporary excavation support systems shall not disturb the existing structures or the completed proposed structures. Damage to such structures shall be repaired by the Contractor at no additional cost to the Owner.
 - 5. The Contractor shall bear the entire cost and responsibility of correcting any failure, damages, subsidence, upheaval or cave-ins as a result of improper installation, maintenance or design of the temporary excavation support systems. The Contractor shall pay for all claims, costs and damages that arise as a result of the Work performed at no additional cost to the Owner.

1.2 SUBMITTALS

- A. Shop Drawing: Submit the following in accordance with Section 01300 Submittals:
 - 1. Submit the following qualifications four (4) weeks prior to the construction:
 - a. Qualifications of Contractor's temporary excavation support system designer as specified in Paragraph 1.3 D.

- b. Qualifications of Contractor's temporary excavation support system installer as specified in Paragraph 1.3 E.
- c. Qualifications of Contractor's independent tieback testing laboratory as specified in Paragraph 1.3 F, if a tieback system is utilized.
- d. Qualifications of Contractor's temporary excavation support system installation supervisor as specified in Paragraph 1.3 G.
- 2. Submit a temporary excavation support plan stamped and signed by a Massachusetts Registered Professional Engineer at least two weeks prior to start of the construction. Do <u>not</u> submit design calculations. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the Site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:
 - a. Proposed temporary excavation support system(s), details, location, layout, depths, extent of different types of support relative to existing features and the permanent structures to be constructed, and methods and sequence of installation and removal.
 - b. If utilizing a tieback system, include tieback installation procedures and criteria for acceptance of tiebacks for performance and proof tests. Submit the tieback testing results to the Engineer for information only.
 - c. Requirements of dewatering during the construction, per Section 02140.
 - d. Minimum lateral distance from the edge of the excavation support system for use for vehicles, construction equipment, and stockpiled construction and excavated materials.
 - e. List of equipment used for installing the excavation support systems.
- 3. Submit a Construction Contingency Plan specifying the methods and procedures to maintain temporary excavation support system stability if the allowable movement of the adjacent ground and adjacent structures is exceeded.
- 4. For excavation support systems left in place, submit the following as-built information prior to backfilling and covering the excavation support systems:

- a. Survey locations of the temporary excavation support systems, including coordinates of the ends and points of change in direction.
- b. Type of the temporary excavation support system.
- c. Elevations of top and bottom of the excavation support systems left in place.

1.3 QUALITY ASSURANCE

- A. Provide in accordance with Section 01400 and as specified.
- B. Conform to the requirements of the OSHA Standards and Interpretations: "Part 1926 Subpart P Excavation, Trenching, and Shoring", and all other applicable laws, regulations, rules, and codes.
- C. All welding shall be performed in accordance with AWS D1.1.
- D. Prepare design, including calculations and Drawings, under the direction of a Professional Engineer registered in Massachusetts and having the following qualifications:
 - 1. Not less than ten (10) years experience in the design of specific temporary excavation support systems to be used.
 - 2. Completed not less than five (5) successful temporary excavation support system projects of equal type, size, and complexity within the last five (5) years.
- E. Temporary Excavation Support System Installer's Qualifications:
 - 1. Not less than three (3) years experience in the installation of similar types and equal complexity as the proposed system.
 - 2. Completed not less than three (3) successful excavation support systems of similar type and equal complexity as the proposed system.
- F. If utilizing a tieback system, employ an independent testing laboratory to test the tieback system with the following qualifications:
 - 1. Be accredited by the American Association of State Highway and Transportation Officials (AASHTO) Accreditation Program.
 - 2. Employ personnel conducting testing who are trained in the methods and procedures to test and monitor tieback systems of similar type and equal complexity, as the proposed system.
 - 3. Have not less than five (5) years experience in testing of tieback systems of similar type and equal complexity as the proposed system.

- 4. Have successfully tested at least three (3) tieback systems of similar type and equal complexity as the proposed system.
- G. Install all temporary excavation support systems under the supervision of a supervisor having the following qualifications:
 - 1. Not less than five (5) years experience in installation of systems of similar type and equal complexity as the proposed system.
 - 2. Completed at least five (5) successful temporary excavation support systems of similar type and equal complexity as the proposed system.

1.4 DESIGN CRITERIA

- A. Design of temporary excavation support systems shall meet the following minimum requirements:
 - 1. Support systems shall be designed for earth pressures, hydrostatic pressure, equipment, temporary stockpiles, construction loads, and other surcharge loads.
 - 2. Design a bracing system to provide sufficient reaction to maintain stability.
 - 3. Limit movement of ground adjacent to the excavation support system to be within the allowable ground deformation as specified.
 - 4. Design the embedment depth below bottom of excavation to minimize lateral and vertical earth movements and provide bottom stability. Toe of braced temporary excavation support systems shall not be less than 5 feet below the bottom of the excavation.
 - 5. Design temporary excavation support systems to withstand an additional 2 feet of excavation below proposed bottom of excavation without redesign except for the addition of lagging and/or bracing.
 - 6. Maximum width of pipe trench excavation shall be as indicated on the Drawings.
 - 7. Do not cast permanent structure walls directly against excavation support walls.

1.5 DELIVERY, STORAGE AND HANDLING

A. Store sheeting and bracing materials to prevent sagging which would produce permanent deformation. Keep concentrated loads which occur during stacking or lifting below the level which would produce permanent deformation of the material.

1.6 **PROJECT/SITE CONDITIONS**
A. Subsurface Conditions: Refer to the Contract Document for available information.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Steel: All soldier piles, wales, rakers, struts, wedges, plates, waterstop and accessory steel shapes shall conform to ASTM A36.
- B. Steel Sheet Piling: ASTM A328, continuous interlocking Z-type. Steel sheet shall be ASTM A572 Grade 60.
- C. Timber Sheeting shall be composed of a 3 layer laminated timber with tongue and groove connecting edges. The toe of the sheeting shall be cut on a diagonal so that, in driving, the pile will be continuously wedged back against the previously driven pile. Timber sheet piling shall conform to the requirements of AASHTO M. 09.01-1.
- D. Timber Lagging Left in Place: Pressured treated per appropriate AWPA standards.
- E. Tieback Tendons: Tieback tendons shall be high strength steel wire strand cables conforming to ASTM A416, or bars conforming to ASTM A722. Splicing of individual cables shall not be permitted.
- F. Raker Ties: ASTM A615 Grade 60.
- G. Cement Grout Materials and Admixtures for Tieback Anchorages: Grout cube strength shall be a minimum 3500 psi at 7 days and 5000 psi at 28 days.
- H. Concrete: Refer to Section 03300.
- I. Tamping tools adapted for backfilling voids after removal of the excavation support system.
- J. Provide specific trench box sizes for each pipe and utility excavation with structural capacity of retaining soil types as described in OSHA's 29 CFR Part 1926 Subpart P.
- K. The boxes shall be composed of sections, the number of which shall be dictated by the depth of excavation. The forward end of the box shall be equipped with cutting edges to facilitate the movement of the box along the trench bottom and shall be equipped with eyelets or hooks by which the excavator may pull the boxes along.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

- A. Installation of the temporary excavation support systems shall not commence until the related earth excavation and dewatering submittals have been reviewed by the Engineer with all Engineer's comments satisfactorily addressed.
- B. Install excavation support systems in accordance with the temporary excavation support plan.
- C. If utilizing a tieback system, all performance and proof tests shall be conducted in the presence of the Engineer. Testing performed without the Engineer present will not be accepted. Repeat testing in the Engineer's presence at no additional cost to the Owner.
- D. Do not drive sheeting within 100 feet of concrete less than seven (7) days old.
- E. Carry out program of temporary excavation support in such a manner as to prevent undermining or disturbing foundations of existing structures of Work ongoing or previously completed.
- F. Perform preparatory Work to discover, protect, maintain and restore, or remove utilities, foundations or other facilities located in close proximity of the proposed excavation lateral support system.
- G. Conduct pre-excavation as necessary to remove obstructions and identify existing utilities along the alignment of the excavation lateral support system which will interfere with installation in accordance with Section 02200 Earthwork.
- H. The Contractor shall provide fully equipped rig(s) and appropriate tools in full-time operation at the Site during the Work, and shall mobilize additional equipment, if necessary, to complete the Work on schedule.
- I. Excavation shall not proceed more than 2 ft (0.6096 meters) below the bracing level, anywhere within the excavation support limits, until the entire level of bracing is completely installed, including prestressing.
- J. Bottom of the trench box excavation support system shall be above the pipe invert prior to installing the pipe.
- K. Install and survey geotechnical instrumentation in accordance with the temporary excavation support plan. Notify the Engineer immediately if any geotechnical instrumentation is damaged. Repair or replace damaged geotechnical instrumentation at the sole option of the Engineer and at no additional cost to the Owner.
- L. Continuously monitor movements of the ground adjacent to excavation support systems and adjacent structures. In event of the measured movements approaching or exceeding the allowable movements, take immediate steps to arrest further movement by revising procedures such as providing supplementary bracing, filling voids behind the trench box, supporting utilities or other measures (Construction Contingency Plan) as required.

M. Notify utility owners if existing utilities interfere with the temporary excavation support system. Modify the existing utility with the utility owner's permission or have the utility owner make the modifications at no additional cost to Owner.

3.2 GROUND DEFORMATION ADJACENT TO EXCAVATION SUPPORT SYSTEMS

- A. Criteria for "threshold" and "limiting" movements of wall elements of excavation support system have been established as follows:
 - 1. "Threshold" Horizontal Movement:

Dx = No greater than 1.0 inch where no buildings are present within 25 ft. of support system

Dx = No greater than 0.5 inch where buildings are present within 25 ft. of support system.

Where Dx = measured horizontal wall movement at any level.

2. "Limiting" Horizontal Movement:

Dx = No greater than 2.0 inches where no buildings are present within 25 ft. of support system

Dx = No greater than 0.75 inch where buildings are present within 25 ft. of support system.

- B. The Contractor shall notify the Engineer and shall take immediate steps to control further movement by revising his procedures, providing supplemental bracing or other measures (working 24 hours per day or temporarily terminating Work in the area of movement if necessary) as required if any of the following occur:
 - 1. Field measurements indicate that any of the "threshold" movement criteria are reached or exceeded.
 - 2. Field measurements or observations indicate that significant or sustained wall movements are occurring (total movement may be less than the "Limiting" movement criteria).
 - 3. Movements of adjacent structures, utilities or other facilities are detected.
- C. If "Limiting" movements are being approached or reached, the Engineer, based on his judgment and review of the movement monitoring data, may require the Contractor to temporarily terminate the Work in the area where such movement is occurring and implement all necessary mitigation measures which are satisfactory to the Engineer, to arrest the movements, at no cost to the Owner.

- D. Horizontal or vertical movement of any point on adjacent structures shall not exceed 0.5 inches. The Contractor shall establish and monitor survey points on the adjacent structures. The Contractor shall take all necessary measures to prevent greater settlements, at no additional cost to the Owner.
- E. These criteria are intended to establish a minimum basis for the Contractor's design and procedures and in no way relieve the Contractor of his sole responsibility for preventing detrimental movements and damage to adjacent structures, utilities or other Work.
- F. Monitoring personnel shall use a procedure for reading and recording geotechnical instrumentation data which compares the current reading to the last reading during data collection to eliminate spurious readings.
- G. Plot the observed ground deformation readings versus time. Annotate the plots with construction loading and excavation events having an impact on the readings. Evaluate plots by means of secondary rate-of-change plots to provide early warning of accelerating ground movements.
- H. Implement Construction Contingency Plan under direction of the temporary excavation support system designer, installation supervisor and the Engineer.

3.3 REMOVAL OF EARTH RETENTION SYSTEM

- A. Sheeting shall <u>not</u> be left in place unless otherwise indicated or approved in writing by the Engineer.
- B. When indicated or approved by the Engineer, remove the temporary excavation support system without endangering the constructed or adjacent structures, utilities, or property. Immediately backfill all voids left or caused by withdrawal of temporary excavation support systems with bank-run gravel, screened gravel or select borrow by tamping with tools specifically adapted for that purpose.
- C. When tiebacks are used, release tension in tiebacks as the excavation is backfilled. Do not leave tensioned tieback in place at the completion of the Work.
- D. The excavation support system left-in-place shall be cut-off a minimum of 2 feet below the bottom of the next higher foundation level or a minimum of 5 feet below finished grade.
- E. Conduct survey of the locations and final cut-off elevations of the excavation support systems left in place.
- F. Submit as-built information, prior to backfilling.

3.4 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700.

END OF SECTION 02160

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SECTION 02200

EARTHWORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions, Division 0 and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY OF WORK

- A. This Section includes excavations of normal depth in earth for trenches and structures; backfilling such excavations to the extent required; filling; rough grading; constructing embankments; miscellaneous earth excavation; temporary excavation support; the removal, hauling and stockpiling of suitable excavated material for subsequent use in the work; all rehandling, hauling and placing of stockpiled materials for use in refilling, filling, backfilling, grading and such other operations; the removal and satisfactory disposal off the site of unsuitable and/or surplus material; compaction; and appurtenant work, complete, in accordance with the Drawings and Specifications, and as directed.
- B. Related Sections include the following:
 - 1. Division 0 Bidding and Contract Requirements
 - 2. Division 1 General Requirements
 - 3. Section 02020 Erosion and Sediment Control
 - 4. Section 02140 Dewatering and Discharge
 - 5. Section 02160 Temporary Excavation Support Systems
 - 6. Section 02273 Geotextile Fabric
 - 7. Section 02920 Topsoil
 - 8. Section 02945 Turf

1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
- B. Backfill Materials: If requested by the Engineer, the Contractor shall pay for and submit a grain size analysis and curve performed in accordance with ASTM D422 for each proposed source of backfill for review by the Engineer. The grain size analysis shall indicate that the backfill material conforms to the gradation requirements specified.

- C. If requested by the Engineer, submit a grain size analysis and a constant head permeability result in accordance with ASTM D422 and ASTM D2434 respectively for each proposed source of the drainage sand for review by the Engineer.
- D. If requested by the Engineer, submit a controlled density fill (CDF) mix design showing the proportions and gradations of all materials.
- E. If requested by the Engineer, submit a modified proctor curve indicating the maximum dry-density and optimum moisture content as determined by ASTM D1557 for each proposed source of backfill for review by the Engineer.
- F. Submit the qualifications of the independent geotechnical testing laboratory performing soil testing and inspection services during earthwork operations. The geotechnical testing laboratory must demonstrate to the Engineer's satisfaction, based on evaluation of laboratory submitted criteria conforming to ASTM D3740, that it has the experience and capability to conduct required field and laboratory geotechnical testing. In addition, the laboratory shall be supervised by a Registered Professional Engineer in the State of Massachusetts.
- G. Submit an excavation, backfilling, and filling plan at least one week prior to start of any earth moving activities. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include, but not be limited to the following items:
 - 1. Detailed sequence of work.
 - 2. General description of construction methods.
 - 3. Numbers, types, and sizes of equipment proposed to perform excavation and compaction.
 - 4. Details of dust control measures.
 - 5. Proposed locations of stockpiled excavation and/or backfill materials.
 - 6. Proposed surplus excavated material off-site disposal areas and required permits.

1.4 EXCAVATION CLASSIFICATIONS

- A. Earth Excavation or "Excavation" consists of removal of materials encountered to the subgrade elevations indicated and subsequent reuse or disposal of the materials removed. All excavation is classified as earth excavation unless it otherwise meets the classifications provided below for exploratory excavation, unauthorized excavation, additional excavation, or rock excavation.
- B. Exploratory Excavation, also referred to as test pits, shall consist of the removal of materials for the purpose of locating underground utilities or structures as an aid in establishing the precise location of new work. Exploratory excavation shall be

performed as shown on the plans and as directed by the Engineer. Exploratory excavation not directed or approved by the Engineer shall be at the Contractor's expense.

- C. Unauthorized Excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be at Contractor's expense.
 - 1. Under footings, foundation bases, concrete slabs, retaining walls or other structures, fill unauthorized excavations to the proper elevations with lean concrete or compacted structural fill as approved by the Engineer. Elsewhere, backfill and compact unauthorized excavations as specified for excavations of the same class, unless otherwise directed by the Engineer.
- D. Additional Excavation:
 - 1. When excavation has reached required subgrade elevations, notify the Engineer who will review subgrade conditions.
 - 2. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by the Engineer.
 - 3. Removal of unsuitable material and its replacement as directed in Paragraph 1.4, D, 2 will be paid on the basis of contract conditions relative to changes in work or as provided for under the unit rates for this classification.
- E. Rock Excavation:
 - 1. Determination of rock excavation classification will be made by the Engineer as specified in Section 02212.

1.5 EXCAVATION

- A. The Contractor shall perform all excavations of every description and of whatever substances encountered, in a manner as required to allow for placing of temporary earth support, forms, installation of pipe and other work, and to permit access to the Engineer for the purpose of observing the work. Excavations shall be to such widths as will give suitable space for the required work. Bottoms of trenches and excavations shall be protected from frost and shall be firm, dry and in an acceptable condition to receive the work; work shall not be placed on frozen surfaces nor shall work be placed on wet or unstable surfaces.
- B. All excavations made in open cut will be controlled by the conditions existing at the various locations and shall always be confined to the limits as designated by the Engineer. In no case shall earth be excavated or disturbed by machinery so near to the finished subgrade for structures and pipelines as to result in the disturbance of the earth

below the subgrade. The final excavation to subgrade should be accomplished with a smooth faced bucket or by hand if directed by the Engineer.

C. The Contractor shall satisfy all dewatering requirements specified in Section 02140 -Dewatering and Discharge before performing trench excavations.

TEMPORARY EARTH SUPPORT 1.6

- A. In accordance with specification Section 02160 Temporary Excavation Support Systems, the Contractor shall furnish, place and maintain such sheeting, shoring, and bracing at locations necessary to support the sides of excavations and to prevent danger to persons or damage to pavements, facilities, utilities, or structures, and to prevent injurious caving or erosion or the loss of ground, and to maintain pedestrian and vehicular traffic as directed and required.
- B. In all sheeting, shoring, and bracing operations, care shall be taken to prevent injury to persons or damage to structures, facilities, utilities, and services. Any injuries to persons shall be the responsibility of the Contractor; and any damage to the work occurring as a result of settlement, water or earth pressure, or other causes due to inadequate bracing or other construction operations of the Contractor shall be satisfactorily repaired or made good by the Contractor, at no additional expense to the Owner.
- C. Where sheeting is to be used, it shall be driven ahead of excavation operations to the extent practicable so as to avoid the loss of material from behind the sheeting; where voids occur outside of the sheeting, they shall be filled immediately with selected fill, thoroughly compacted.
- D. The Contractor shall leave in place all sheeting and bracing at the locations and within the limits ordered by the Engineer in writing. The Contractor shall cut off the sheeting at elevations to be determined by the Engineer.
- E. Conform to the requirements of the OSHA Standards and Interpretations: "Part 1926 Subpart P-Excavation, Trenching, and Shoring".
- F. The Contractor shall comply with all federal, state, and local safety regulations and requirements.

1.7 **GROUNDWATER CONTROL**

A. In accordance with specification Section 02140 – Dewatering and Discharge, the Contractor shall provide, at his own expense, adequate pumping and drainage facilities to maintain the excavated area(s) sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. The drainage of all water resulting from pumping shall be managed so as not to cause damage to adjacent down gradient property or resource areas.

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- B. Any damage resulting from the failure of the dewatering operations of the Contractor, and any damage resulting from the failure of the Contractor to maintain all the areas of work in a suitable dry condition, shall be repaired by the Contractor, as directed by the Engineer, at no additional expense to the Town. The Contractor's pumping and dewatering operations shall be carried out in such a manner as to prevent damage to the Contract work and so that no loss of ground will result from these operations. Precautions shall be taken to protect new work from flooding during storms or from other causes. Pumping shall be continuous where directed by the Engineer to protect the work and/or maintain satisfactory progress.
- C. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected. Water from the trenches, excavations, and drainage operations shall be disposed of in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or resource areas, or damage to the work completed or in progress.
- D. The Contractor shall 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, temporary ditches shall be provided for drainage. Upon completion of the work and when directed, all areas shall be restored by the Contractor in a satisfactory manner and as directed.

PART 2 – PRODUCTS

2.1 BACKFILL MATERIALS

- A. Common fill (gravel borrow or backfill) for trench backfill between pipe bedding and pavement sub-base, or as directed by Engineer, shall conform to MassDOT Standard Spec. M1.03.0, Type b and shall consist of inert material that is hard, durable stone and coarse sand free from frost, frozen lumps, loam and clay, surface coatings, and deleterious materials.
 - 1. Graduation requirements for gravel shall be determined by AASHTO-T11 and T27 and shall conform to the following:

SIEVE	NOMINAL PERCENT
DESIGNATION	PASSING BY WEIGHT
1/2-inch	50-85
No. 4	40-75
No. 50	8-28
No. 200	0-10

- 2. Maximum size of stone in gravel shall be 3 inches largest dimension.
- B. Structural Fill: Structural fill shall consist of gravel and sand consisting of hard durable particles, and free from trash, ice and snow, tree stumps, roots and other organic and deleterious or organic matter. Structural fill shall conform to the following gradation requirements.

SIEVE	Nominal Percent Passing	
DESIGNATION	BY WEIGHT	
8-inch	100 (1)	
3-inch	70-100	
1-inch	45-90	
No. 4	20-70	
No. 10	15-60	
No. 40	10-40	
No. 200	5-12	
Notes:		
(1) Two-inch maximum particle size within 12		
inches of slab, footing or pavement grade.		

C. Sand and Gravel: Sand and gravel fill shall consist of hard, durable sand and gravel, and shall be free from ice and snow, roots, sod, rubbish, and other deleterious or organic matter. It shall conform to the following gradation requirements as designated by MHD M1.03.0.

SIEVE DESIGNATION	Nominal Percent Passing By Weight		
(a)	100		
1/2-inch	50-85		
No. 4	40-75		
No. 10			
No. 40	10-35		
No. 100	(b)		
No. 200	0-8		
Notes:			
(a)Maximum grain size shall be four (4)-inches where			
placed as base below slab and pavement; Type A (maximum			
grain size 6-inc	hes) or Type C (maximum grain size 2-		
inches) as specified in the Contract Drawings; elsewhere $2/3$			
of the loose lift thickness.			
(b)The amount passing the No. 100 sieve should be between			
40 percent and 70 percent of the amount passing the No. 40			
sieve.			

D. Crushed Stone: Crushed stone shall consist of durable crushed rock or durable crushed gravel stone, free from ice and snow, sand, clay, loam, or other deleterious or organic material. The crushed stone shall be uniformly blended and shall conform to the following gradation requirements as designated by MHD M2.01.0.

SIEVE DESIGNATION	NOMINAL PERCENT PASSING BY WEIGHT		
Sieve Size	1 ¹ / ₂ -inch Stone	3/4-inch Stone*	1/2-inch Stone
2-inch	100		
1 ½-inch	95-100		
1-inch	35-70	100	
3/4-inch	0-25	90-100	
5/8-inch			100
1/2-inch		10-50	85-100
3/8-inch		0-20	15-45
No. 4		0-5	0-15
No. 8			0-5

*Stone shall be washed

E. Processed Gravel for Subbase: Processed gravel for subbase shall be used where specified and shall consist of inert material that is hard, durable stone and coarse sand free from frost, frozen lumps, loam and clay, surface coatings, and deleterious materials.

Gradation requirements for Processed gravel for subbase shall be as designated by MHD M1.03.1 and shall conform to the following:

SIEVE DESIGNATION	Nominal Percent Passing By Weight
3 inch	100
1 1/2"	70-100
3/4"	50-85
No. 4	30-60
No. 200	0-10

F. Drainage Sand: Drainage sand shall consist of clean inert, hard, durable grains of quartz or other hard durable rock, free from clay, organics, surface coatings or other deleterious material. Coarse sand shall have an internal friction angle of 30 degrees. Coarse sand shall conform to the following gradation requirements as designated by MHD M1.04.1

SIEVE	NOMINAL PERCENT PASSING	
DESIGNATION	By Weight	
1/2-inch	100 (1)	
3/8-inch	85-100	
No. 4	60-100	
No. 16	35-80	
No. 50	10-55	
No. 100	2-10	
No. 200	0-10	
Notes:		
(1) Maximum grain size shall be 1/4-inches		

Coarse drainage sand shall be free of all angular materials and shall have a minimum permeability of 1.0×10^{-3} cm/sec at the thickness shown on the Drawings.

G. Dense Graded Crushed Stone: Dense graded crushed stone shall consist of durable crushed rock or durable crushed gravel stone and fine aggregates of natural sand or stone screenings uniformly mixed, free from ice and snow, sand, clay, loam, or other deleterious or organic material. The crushed stone shall be uniformly blended and shall conform to the following gradation requirements as designated by MHD M2.01.7.

SIEVE	Nominal Percent Passing
DESIGNATION	B Y WEIGHT
2-inch	100
1 1/2-inch	70-100
3/4-inch	50-85
No. 4	30-55
No. 50	8-24
No. 200	3-10

- H. Loam Borrow (Topsoil): Loam borrow shall consist of fertile, friable, natural topsoil, having similar properties to the existing topsoil in the area. It shall be a mixture of sand, silt, and clay and be free from ice and snow, roots, weeds, heavy or stiff clay, stones larger than 1 inch diameter, or other deleterious material.
 - 1. Loam borrow shall have a mildly alkaline to medium acid pH between 6.0 and 7.5.
 - 2. Soluble salts shall not exceed 4 milli-mhos per centimeter.
 - 3. Organic Content: 5 to 10%
 - 4. Additives: As required by soil analysis of Topsoil for lawn areas.

SIEVE	NOMINAL PERCENT PASSING	
DESIGNATION	BY WEIGHT	
No. 10	85-100	
No. 40	35-85	
No. 200	10-35	
<20µm	0-5	

I. Screened Gravel: Screened gravel for use as directed by the Engineer shall consist of hard, durable, particles of proper size and gradation, free from sand, loam, clay, excess fines and deleterious materials. The size of the particles shall be uniformly graded gravel such that not less than 95 percent of the particles will pass a 1/2-in sieve, 40 to 70 percent will pass the 3/8-in sieve, and not more than 5 percent will pass a No. 4 sieve.

2.2 CONTROLLED DENSITY FILL

- A. Controlled Density Fill (CDF) or "Flowable Fill" material is flowable, selfconsolidating, rigid settings, low density material that substitutes for compacted gravel for backfills, fills, and structural fills. There are two main categories for CDF's, excavatable and non-excvavatable with a subcategory of flowable and very flowable. It shall be a mixture of Portland cement, flyash, sand, and water designed to provide strengths within the range specified. The Categories of CDF's are:
 - 1. Type 1 Very Flowable (Non-Excavatable).
 - 2. Type 1E Very Flowable (Excavatable).
 - 3. Type 2 Flowable (Non-Excavatable).
 - 4. Type 2E Flowable (Excavatable).
- B. Controlled Density Fill shall meet the requirements as described in MassDOT Standard Specifications Subsection M4.08.0. Controlled Density Fill for this project shall be Type 1E - Very Flowable (Excavatable), as described in MassDOT Subsection M4.08.0.
- C. Controlled Density Fill shall be batched at a ready mix plant and is to be used at a high or very high slump of approximately 10- to 12-inches.

2.3 DUST CONTROL

A. Water application shall be the only mean for dust control.

2.4 DUMPED RIPRAP

- A. Dumped Riprap shall consist of hard, durable angular shaped stones. Rounded stone, boulders, sandstone, and similar soft stone or relatively thin stones shall not be accepted. Dumped Riprap shall be free from overburden, spoil, shale, and organic material. Each load shall be reasonably well graded.
- B. Dumped Riprap shall conform to MassDOT Standard Spec. M2.02.2.

SIZE OF STONE (LB)	MAXIMUM PERCENT OF TOTAL WEIGHT SMALLER THAN GIVEN SIZE
400	100
300	80
200	50
25*	10

* No more than 5% by weight shall pass a 2-inch sieve.

2.5 STONE FOR PIPE ENDS

C. Stone for Pipe Ends shall consist of hard, durable angular shaped stones. Rounded stone, boulders, sandstone, and similar soft stone or relatively thin stones shall not be accepted. Each stone shall weigh not less than 50 lb, not more than 125 lb, and at least 75% of the volume shall consist of stoned weighing not less than 75 lb each. The remainder of the stones shall be graded so that wen placed with the larger stones, the entire mass will be compact. Stone for Pipe Ends shall conform to MassDOT Standard Spec. M2.02.3.

2.6 MODIFIED ROCKFILL

D. Modified Rockfill shall consist of hard, durable angular shaped stones which are the product of the primary crushing of a stone crusher. Rounded stone, boulders, sandstone, and similar soft stone or relatively thin stones shall not be accepted. Modified Rockfill shall be free from overburden, spoil, shale, and organic material. Modified Rockfill shall conform to MassDOT Standard Spec. M2.02.4.

SIZE OF STONE (IN)	PERCENT PASSING
8	95-100
4	0-25
2 1/2	0-5

PART 3 – EXECUTION

3.1 FILLING AND BACKFILLING

- A. Subgrade Preparation: After the subgrade has been shaped to line, grade, and cross-section, it shall be thoroughly compacted. This operation shall include any required reshaping and wetting to obtain proper compaction. All soft or otherwise unsuitable material shall be removed and replaced with suitable material from excavation or borrow. The resulting area, and all other low sections, holes, or depressions shall be brought to the required grade with accepted material and the entire subgrade shaped to line, grade and cross-section and thoroughly compacted.
- B. Backfill Material Selection: Unless otherwise specified or directed, material used for filling and backfilling shall meet the requirements specified under Materials (Part 2). In general, the material used for backfilling utility trench excavations shall be material removed from the excavations provided that the reuse of these materials result in the required trench compaction and meets the requirements specified. All backfill placed within the building limits shall be structural fill unless otherwise specified. In areas where the bottom of the excavation is in fine sand and silt, and is below the groundwater table, the first lift of backfill shall be 12-inches of compacted sand and gravel to provide a working mat and drainage layer.
 - 1. Place backfill to a maximum loose lift thickness of 12 inches. Maintain backfill material with uniform moisture content, with no visible wet or dry streaking, between plus 2 percent and minus 3 percent of optimum moisture content. The final

filled soil mass shall be as uniform as possible in lift thickness, moisture content, and effort required to compact soil mass.

- C. Trench Backfill:
 - 1. The trenches shall be backfilled as soon as practicable with suitable material. All trench backfilling shall be done with special care, in the following manner and as directed by the Engineer.
 - 2. Backfill material for pipe bedding shall be deposited in the trench, uniformly on both sides of the pipe, for the entire width of the trench to the springline of the pipe. The selected backfill material shall be placed by hand shovels, in layers not more than 4-inches thick in loose depth, and each layer shall be thoroughly and evenly compacted by tamping on each side of the pipe to provide uniform support around the pipe, free from voids.
 - 3. The balance of backfill shall be spread in layers not exceeding 12-inches in loose depth. Each layer shall be thoroughly compacted by mechanical methods and shall contain no rock, stones or boulders larger than 4-inches in their greatest dimension.
 - 4. All trench backfilling shall be done with special care and must be carefully placed so as not to disturb the work at any time; if necessary, a timber grillage or other suitable method shall be used to break the fall of material. The moisture content of the backfill material shall be such that proper compaction will be obtained. Puddling of backfill with water will not be permitted. Backfill within areas to receive topsoil or pavement construction shall be made to grades required to establish the proper subgrade for the placement of topsoil or pavement base courses.
 - 5. In backfilling trenches, each layer of backfill material shall be moistened and compacted to a density at least equal to that of the surrounding undisturbed earth, and in such a manner as to permit the rolling and compaction of the filled trench or excavation with the adjoining earth to provide the required bearing value, so that paving of the excavated and disturbed areas, where required, can proceed immediately after backfilling is completed.
 - 6. Any trenches or excavations improperly backfilled or where settlement occurs shall be reopened, to the depth required for proper compaction, then refilled and compacted with the surface restored to the required grade and condition, at no additional expense to the Owner.
 - 7. During filling and backfilling operations, pipelines will be checked by the Engineer to determine whether any displacement of the pipe has occurred. If the observation of the pipelines shows poor alignment, displaced pipe, or any other defects they shall be remedied in a manner satisfactory to the Engineer at no additional cost to the Owner.
- D. Backfilling Against Structures:

- 1. Backfilling against masonry or concrete shall not be done until permitted by the Engineer. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been satisfactorily completed, special leakage tests of the structures shall be made by the Contractor, as required by the Engineer. After the satisfactory completion of leakage tests and the satisfactory completion of any other required work in connection with the structures, the backfilling around the structures shall proceed using suitable and approved excavation material. The best of the backfill material shall be used for backfilling within 2 feet of the structure. Just prior to placing backfill, the areas shall be cleaned of all excess construction material and debris and the bottom of excavations shall be in a thoroughly compacted condition.
- 2. Symmetrical backfill loading shall be maintained. Special care shall be taken to prevent any wedging action or eccentric loading upon or against the structures. During backfilling operations, care shall be exercised that the equipment used will not overload the structures in passing over and compacting these fills. Except as otherwise specified or directed, backfill shall be placed in layers not more than 12-inches in loose depth and each layer of backfill shall be compacted thoroughly and evenly using approved types of mechanical equipment. Each pass of the equipment shall cover the entire area of each layer of backfill.
- 3. In compacting and other operations, the Contractor shall conduct his operations in a manner to prevent damage to structures due to passage of heavy equipment over, or adjacent to, structures, and any damage thereto shall be made good by the Contractor at no additional expense to the Owner.
- E. After backfilling trenches and excavations, the Contractor shall maintain the surfaces of backfill areas in good condition so as to present a smooth surface at all times level with adjacent surfaces. Any subsequent settling over backfilled areas shall be repaired by the Contractor immediately, in a manner satisfactory to the Engineer, and such maintenance shall be provided by the Contractor for the life of this Contract, at no additional expense to the Owner.
- F. The finished subgrade of the fills and filled excavations upon which topsoil is to be placed, or pavements are to be constructed, shall not be disturbed by traffic of other operations and shall be maintained in a satisfactory condition until the finished courses are placed. The storage or stockpiling of materials on finished subgrade will not be permitted.
- G. Uniformly smooth grading of all areas to be graded, as indicated and as directed, including excavated and filled sections, embankments and adjacent transition areas, and all areas disturbed as a result of the Contractor's operations, shall be accomplished. The finished surfaces shall be reasonably smooth, compacted and free from surface irregularities.

3.2 COMPACTION

A. Compaction Requirements: The degree of compaction is expressed as a percentage of the maximum dry density at optimum moisture content as determined by ASTM Test D1557, Method C. The compaction requirements are as follows:

AREA	ASTM DENSITY DEGREE OF COMPACTION
Below footings	95%
Below slabs	95%
Against concrete structures	95%
Pavement base course	95%
Pavement subbase	95%
General fill below pavement subbase	95%
Trench backfill - below pavements	95%
- below landscaped areas	92%
- below structures	95%
Other areas	As Directed

- B. Moisture Control:
 - 1. Fill that is too wet for proper compaction shall be disced, harrowed, or otherwise dried to a proper moisture content to allow compaction to the required density. If fill cannot be dried within 24 hours of placement, it shall be removed and replaced with drier fill.
 - 2. Fill that is too dry for proper compaction shall receive water uniformly applied over the surface of the loose layer. Sufficient water shall be added to allow compaction to the required density.
- C. Unfavorable Conditions:
 - 1. In no case shall fill be placed over material that is frozen. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until the moisture content and the density of the previously placed fill are as specified.
 - 2. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of the day's operations. Prior to terminating work for the day, the final layer of compacted fill shall be rolled with a smooth wheeled roller to eliminate ridges of soil left by compaction equipment.
- D. Compaction Control:
 - 1. In-place density tests shall be made in accordance with ASTM D1556, D2922 or D2167 as the work progresses, to determine the degree of compaction being attained by the Contractor. Any corrective work required as a result of such tests, such as additional compaction, or a decrease in the thickness of layers, shall be performed by the Contractor at no additional expense to the Owner. In-place

density tests shall be made at the Contractor's expense by the geotechnical testing laboratory, a minimum of 4 days of testing.

- 2. The Engineer's duties do not include supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Engineer nor any observation and testing performed by him shall excuse the Contractor from defects discovered in his work at that time or subsequent to the testing.
- 3. In-place density tests shall be performed as a minimum according to the following:
 - i. One test per lift under spread footings.
 - ii. One test per lift for every 50' length of strip footings or retaining walls.
 - iii. A minimum of every 50 cubic yards of backfill in trenches or around structures.
 - iv. One test every 100 cubic yards of material placed for embankment construction.
- 4. Minimum testing requirements for granular drainage and cover material are as follows:

TYPE OF TEST	FREQUENCY	TESTING METHOD(S)
Grain Size Analysis (to the No. 200 Sieve)	1 test/500 cy	ASTM D-422
Proctor Compaction Test	As determined by Engineer	ASTM D-1557

E. Placement:

1. All fill shall be placed in horizontal layers. Fill shall not be placed following the natural contours of the ground. Fill shall be placed starting in the lowest areas working up to finish grades in horizontal layers in the manner specified herein. Each layer of fill should be benched into the existing slope in order to avoid the formation of a shear plane.

3.3 FINE GRADING

- A. Before surface or subbase is spread, the subgrade shall be shaped to a true surface conforming to the Drawings. All depressions and high spots shall be filled with suitable material or removed and such areas again compacted until the surface is smooth and properly compacted. A tolerance of 1/2-inch above or below the finished subgrade will be allowed provided that this 1/2-inch above or below grade is not maintained for a distance longer than 50 feet and that the required crown is maintained in the subgrade. Any portion which is not accessible to a roller shall be thoroughly compacted by other mechanical methods.
- 3.4 STOCKPILING AND USE OF SURPLUS EXCAVATED MATERIALS EARTHWORK ske Cochichewick Bost Launch 02200-14

- A. The Contractor shall strip and stockpile excavated materials. Any bushes that are removed shall be protected and replanted in the same location. Removed curbing shall be stockpiled in a safe manner. Where grassed areas are disturbed by stockpiled materials, the Contractor shall rake out the area and loam and re-seed at his expense.
- B. Stockpiling of materials shall be included in the pay items for excavating and no allowances shall be made for any stripping and stockpiling requirements.
- C. Should conditions make it impracticable or unsafe to stack material adjacent to the trench, the material shall be hauled and stored at a location provided by the Contractor. When required, it shall be re-handled and used in backfilling the trench.
- D. Use of surplus excavated materials (not including pavement or asphaltic concrete) as back-fill material is permitted if surplus material meets requirements of backfill materials as specified above. All other surplus material shall be taken off-site and disposed of legally at the Contractor's expense.
- E. Testing of surplus excavated materials shall be provided as described in Paragraph 1.3. to confirm compliance with specifications. Submit test results to Engineer one week prior to backfill operations.

3.5 EXCAVATION SUPPORT SYSTEM

- A. Furnish, put in place and maintain sheeting and bracing required by Federal, State or local safety requirements to support the sides of the excavation and prevent loss of ground which could endanger personnel, damage or delay the work, or endanger adjacent structures. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he/she may order additional supports placed at the expense of the Contractor. Compliance with such order shall not relieve the Contractor from his/her responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.
- B. When moveable trench bracing such as trench boxes, manhole boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the screened gravel backfill.
- C. When installing pipe; trench boxes, moveable sheeting, shoring or plates shall not be allowed to extend below mid-diameter of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, screened gravel shall be placed to fill any voids created and the screened gravel and backfill shall be recompacted to provide uniform side support for the pipe.
- D. The Contractor will be permitted to use steel sheeting in lieu of wood sheeting for the entire job wherever the use of sheeting is necessary. The cost for use of sheeting will be included in the bid items for pipe and shall include full compensation for driving, bracing and later removal of sheeting.

- E. All sheeting and bracing shall be carefully removed in such manner as not to endanger the construction of other structures, utilities, or property, whether public or private. All voids left after withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose, by watering or otherwise as directed.
- F. The Contractor shall receive no payment, for sheeting, bracing, etc., during the progress of the work. The Contractor shall receive no payment for sheeting which has actually been left in place for the convenience of the Contractor.
- G. Sheeting driven below mid-diameter of any pipe shall remain in place from the driven elevation to at least 1-ft above the top of the pipe.

3.6 DUST CONTROL

- A. Calcium chloride application will not be permitted unless it is approved by the Engineer
- B. Water application shall be the only method used for dust control. Application shall be by means of a water truck or other approved method. The number and frequency of applications shall be determined by the Engineer.

3.7 PLACING TOPSOIL

A. Scarify compacted subgrade to a 2-inch depth to bond topsoil to subsoil. Place topsoil to a minimum depth of four (4) inches for areas disturbed by Contractor's construction operations and as shown on the Drawings. Spread evenly and grade to elevations and slopes shown. Hand rake areas inaccessible to machine grading.

3.8 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700 – Contract Closeout.

END OF SECTION 02200

SECTION 02211

ROUGH GRADING

PART 1 - GENERAL

1.1 SUMMARY

- A. Removal of topsoil and subsoil.
- B. Cutting, filling, and rough grading the site for site structures, building foundations and facilities, bituminous concrete areas and landscaping.

1.2 RELATED SECTIONS

- A. Drawings and general provisions of DIVISION 0 BIDDING AND CONTRACT REQUIREMENTS and other DIVISION 1 Specification Sections, apply to this section. Related Sections include the following:
 - 1. Section 02140-Dewatering and Discharge
 - 2. Section 02200-Earthwork

1.3 SUBMITTALS FOR REVIEW

A. The Contractor shall submit soil analysis report from a certified laboratory, for the in-situ materials, any material to be used as fill, loam, sand, stone, gravel and any other type of material fill for review and approval by the Engineer.

1.4 REFERENCES

- A. ASTM D-422 Grain Size Analysis.
- B. ASTM D1556 Test Method for Density of Soil in Place by the Sand-Cone Method.
- C. ASTM D1557 Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. Rammer and 18-inch drop.
- D. ASTM D2922 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- E. Massachusetts Highway Department Standard Specifications for Highways and Bridges (1988 Edition, or latest edition)
- 1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with related specification sections and the Massachusetts Highway Department Standard Specifications for Highways and Bridges (1988 Edition, or latest edition). Maintain one (1) copy on site.
- B. The Engineer must approve the final subgrade over the entire site.

1.6 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 01700, Contract Closeout a detailed as-built drawing showing all actual finish grades for the entire site in no less than a 50' grid.
- B. Accurately record actual locations of utilities newly installed, to be relocated and to remain by horizontal dimensions, elevations or inverts, and slope gradients.

PART 2 - MATERIALS

2.1 FILL MATERIALS

- A. Fill Types: As specified in Section 02200, Earthwork.
- B. Existing loam that is stripped from the site and is in excess of that necessary to be reused on site shall be legally disposed of by the Contractor at an offsite location.
- C. Existing subsoil that is stripped from the site may be reused as fill material within landscaped areas as approved by the Engineer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify site conditions under provisions of Section 01010, Summary of Work.
- B. Verify that survey benchmark and elevations of existing utilities to be reused are as indicated on the Contract Drawings. Any discrepancies shall be resolved by the Engineer prior to construction layout.

3.2 PREPARATION

- A. Identify required lines, levels, grades, and datum.
- B. Contractor shall contact DIGSAFE prior to commencement of any activities to demarcate the locations of known utilities.
- C. Locate, identify, and protect utilities that remain, from damage.
- D. Notify the respective utility companies to remove and relocate utilities as required by the Contract Drawings.

- E. Protect above and below grade utilities that remain.
- F. Protect plant life, lawns, rock outcropping and other features remaining as a portion of final landscaping.
- G. Protect benchmarks, survey control points, existing structures, fences, sidewalks, paving, and curbs from excavating equipment and vehicular traffic.

3.3 TOPSOIL EXCAVATION

- A. Strip full depth of topsoil from the following areas:
 - 1. Under any proposed paved and building areas.
 - 2. Under proposed concrete walkways, slabs, foundations, and retaining walls.
- B. All soils in excess of project requirements shall be hauled and legally disposed of to a location designated by the Contractor.
- C. Engineer to approve loam to be reused on the site.

3.4 SUBSOIL EXCAVATION

- A. Excavate subsoil from areas to be further excavated, regraded, or filled.
- B. Do not excavate wet subsoil.
- C. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill in the particular area.
- D. Engineer to approve subsoil for reuse onsite.

3.5 EXISTING SUBGRADE PREPARATION

- A. Compact existing subgrade to density requirements for subsequent backfill materials.
- B. Existing subgrade must be approved by the Engineer prior to any regrading.
- C. Cut out soft areas of subgrade not capable of compaction in place or as required by the Engineer. Backfill with required type of fill and compact to density equal to or greater than requirements for subsequent fill material.

3.6 GRADING

- A. Materials cut from site are to be approved by the Engineer to be reused on the site. Materials approved for reuse are to be screened and stockpiled on the site as necessary to complete the job. All excess materials are to be removed from the site.
- B. Fill areas to grades and elevations, depicted on the Contract Drawings, with approved backfill materials.
- C. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen or spongy subgrade surfaces.
- D. Granular Fill: Place and compact materials in equal continuous layers not exceeding twelve (12) inches compacted depth.
- E. Employ a placement method that does not disturb or damage other work.
- F. Maintain optimum moisture content of backfill materials to attain required compaction density.
- G. Make gradual grade changes. Blend slope into level areas.
- H. Remove surplus backfill materials from site.

3.7 TOLERANCES

A. Top Surface of Proposed Subgrade: Plus or minus 1/2 inch from finished elevations.

3.8 FIELD QUALITY CONTROL

- A. Compaction testing and frequency shall be performed in accordance with Specification Section 02200, Earthwork.
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.
- C. Proof roll subgrade surfaces under slabs-on-grade, paving, and foundations.
- D. All surfaces to be graded to not allow ponding of water. All surfaces shall be graded to freely drain into the drainage system.

3.9 PROTECTION OF FINISHED WORK

A. Reshape and re-compact fills subjected to vehicular traffic.

END OF SECTION 02211

ROUGH GRADING 02211-4

SECTION 02212

ROCK EXCAVATION

PART 1 – GENERAL

1.1 SUMMARY

- A. Rock excavation may be required where boulders, monolithic concrete, reinforced concrete or stone structures measuring in excess of <u>two cubic yards solid</u> in volume or larger are encountered or solid ledge which, in the opinion of the Engineer, requires drilling and blasting, wedging, sledging, barring, or hydraulically fracturing for removal, is encountered.
- B. The following do not constitute rock excavation: hardpan; soft or disintegrated rock; concrete which can be removed with a pick; previously blasted rock or broken stone less than the above mentioned two cubic yards; stone walls; rocks or sections of blasted ledge that may fall into or be jarred loose from the sides of the trench beyond the maximum limits of excavation approved by the Engineer.
- C. The blasting shall be accomplished by an experienced technician and the Contractor or Subcontractor shall be conducted in accordance with 527 CMR 13.00. The Contractor will procure the proper blasting permit from the Fire Department and shall acknowledge all the contents and laws of the State Fire Marshall in handling, using, storing and transporting explosives and caps. Blasting shall be conducted with all possible care so as to avoid injury to persons and property. The rock shall be well covered with suitable mats or heavy logs chained together or other such effective appliances; sufficient warning shall be given to all persons in the vicinity of the work before blasting. Extreme care shall be taken to avoid injury to water mains and services, gas pipes, sewers, drain ducts, cables and other structures.
- D. In addition to adhering to all the laws and ordinances relating to the handling and storage of explosives, the Contractor shall also conform to any further regulations deems necessary by the Fire Department Chief and the Engineer and be aware of any inspection fees as required by the fire department.

1.2 SCOPE OF WORK

- A. Furnish all labor, materials, equipment, and incidentals required to excavate and dispose of rock and boulders as shown on the Drawings and as specified herein.
- B. Blasting permits are the responsibility of the Contractor. All applications and fees shall be provided by the Contractor. When permits have been obtained, blasting may be used to fracture rock and boulders for excavation. If blasting is performed, provide the services of a qualified blasting technician, licensed in Massachusetts.
- C. All arrangements for inspections required by the Fire Department shall be made by the Contractor.

N. Lake Cochichewick Boat Launch
North Andover, MA

1.3 RELATED WORK

- A. Earth excavation and backfilling are included in Section 02200.
- B. Environmental Protection is included in Section 01110 and Section 02020.

1.4 SUBMITTALS

- A. Submit three copies of blasting permits required by local agencies and authorities. Original permits shall be prominently displayed on the Work site prior to initiating blasting operations. Submittals shall be for information only. Contractor shall remain responsible for means, methods, and techniques, as well as all safety considerations.
- B. All blasting shall be in accordance with 527 CMR 13.00.
- C. The cost for all photographs and/or pre-blast videotapes shall be included in the bid price.
- D. Fees for inspection shall be paid directly to the Fire Department, telephone number (781) 246-6435. All fees for inspection shall be included in the blasting cost.

1.5 DELIVERY, STORAGE, AND HANDLING

A. The delivery, storage, and handling of explosives shall be performed only by qualified persons licensed in Massachusetts, and shall be in full conformance with all laws, regulations, ordinances, and practices. Extreme care shall be taken to avoid injury or damage to persons or property.

1.6 DEFINITIONS

A. Typical of materials classified as rock are boulders 2.0 cu. yd. or more in volume, solid rock, rock in ledges, and rock-hard cementitious aggregate deposits. Intermittent drilling, blasting or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation. Do not perform rock excavation work until material to be excavated has been cross-sectioned and classified by Engineer. If the area to be excavated is preblasted prior to the excavation of overburden soils, the Engineer shall be notified at least two days in advance to allow observation of the preblast drilling by the Engineer in order to classify the excavation. Visual observation classifications. Removal of rock excavation prior to classification by the Engineer in writing. Such excavation will be paid on the basis of contract unit rates for this classification.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Gravel borrow shall be as specified in Section 02200.

PART 3 – EXECUTION

3.1 BLASTING

- A. Blasting shall only be permitted if accepted by the Town.
- B. All blasting operations, including transportation, handling, storage and protection of detonators and explosives shall comply with the requirements of the Department of Labor, Occupational Safety and Health Administration provisions, as well as those of State and local regulations. In the case of conflict of regulations, the most stringent regulations shall apply.
- C. Pre-blast condition survey: Prior to the start of earth/rock excavation or blasting work, the Contractor shall engage an independent professional engineer, experiences in performing Pre-blast Surveys, to conduct a pre-blast condition survey of all existing structures and conditions on the site, adjacent to the site, or in the vicinity of the site. This survey shall extend to such structures or conditions as may be affected by the contractor's construction operations. As a minimum, condition surveys shall be performed on structures within 300' of anticipated blasting areas.

The Contractor shall also:

- 1. Coordinate activities, issue notices, obtain clearance and provide whatever photographic and secretarial assistance is necessary to accomplish the survey.
- 2. Give seven days notice in writing, to the owner of the property concerned, and tenants of the property. Advise in notice the dates on which surveys are to be made so that they may have representatives present during the examination. Provide copies of all notices to the Engineer.
- 3. The survey shall consist of a description of the interior and exterior conditions of the various structures examined. Descriptions shall locate any cracks, damage, or other defects existing and shall include such information so as to make it possible to determine the effect, if any, of the construction operations on the defect. Where significant cracks, damage, or other defects exist, or for defects too complicated to describe in words, photographs, shall be taken and made part of the record.
- 4. The Contractor's record of the pre-blast survey shall consist of written documentation and photographs of the condition identified, or a good quality videotape survey with appropriate audio description of conditions and defects. Prior to the start of the work, one copy of the Contractor's record of condition survey shall be submitted to the Engineer for information and retention.

- 5. The Contractor shall make an examination similar to the preconstruction survey of any properties, structures, and conditions where complaints of damage have been received or damage claims have been filed and give notice to all interested parties so that they may be present during the final examination. Record of the final examination shall be distributed the same as the original preconstruction survey.
- 6. Any damage noted after completion of blasting operations which cannot be determined from the pre-blast survey to be a pre-existing condition shall be presumed to have been caused by blasting operations. Such damage shall be repaired promptly and completely to the property owner's satisfaction to restore the condition of the property to that existing prior to blasting.
- 7. Pre-blast survey records shall be maintained for a period of not less than three years following final completion and acceptance of the Work.
- D. Indemnity: Notwithstanding full compliance with specifications, as well as the blasting plan, and successful limitation to maximum peak particle velocity and airblast overpressure noted below, the Contractor shall be solely responsible for any damage, direct or indirect, arising from blasting and shall hold the Owner and Engineer harmless from any costs of defense, arising from such damage, real or alleged. The Owner and Engineer shall be additionally named insured on any insurance policy covering blasting carried by the Contractor, and this requirement shall also be enforced on any subcontractor.
- E. Qualifications:
 - 1. Persons responsible for blasting shall be licensed blasters in the Commonwealth of Massachusetts and shall have had acceptable experience in similar excavations in rock and controlled blasting techniques.
 - 2. Blast monitoring shall be conducted by an independent, qualified professional engineer or seismologist, trained in the use of a seismograph, and records shall be analyzed and results reported by persons familiar with analyzing and reporting the frequency content of a seismograph record.
- F. Codes, Permits, and Regulations:
 - 1. The Contractor shall comply with all applicable laws, rules, ordinances, and regulations of the Federal Government, the Commonwealth of Massachusetts, and the Town, governing the transportation, storage, handling, and use of explosives. All labor, materials, equipment, and services for the blasting operations shall comply with such requirements and shall be provided without additional cost to the Owner.
 - 2. The Contractor shall obtain and pay for all permits and licenses required to complete the work of this section, including permit(s) to transport explosives.

- 3. In case of conflict between regulations or between regulation and Specifications, the Contractor shall comply with the strictest applicable codes, regulations, or specifications.
- 4. All blasting shall be in accordance with 527 CMR 13.00.
- G. Safety Procedures
 - 1. Clearing the Danger Area Before Blasting: No blasting shall be permitted until the Contractor removes all personnel from the danger area to safety. A loud, audible, warning system, devised and implemented by the Contractor, shall be sounded before each blast. The Contractor shall familiarize all personnel on the project, Owner, Police Officers, and Engineer with the implemented system. The danger area shall be patrolled before each blast to make certain that it has been completely cleared, and guards shall be stationed to prevent entry until the area has been cleared by the blaster following the blast.
 - 2. Explosives shall be stored, handles, and employed in accordance with federal, state, and local regulations.
 - 3. No explosives, caps, detonators, or fuses shall be stored on the site during non-working hours.
 - 4. Blasting mats shall be used to cover the top and vertical face of all blasts in order to minimize the possibility of excessive throw of rock. Any damaged mats shall be replaced with mats in good condition before blasting continues.
 - 5. The Contractor shall be responsible for determining all safety requirements unique to blasting operations at these particular sites so as not to endanger life, property, utility service, any existing or new construction, or any property adjacent to the site.
 - 6. No requirement of, or omission to require, any precautions under this Contract shall be deemed to limit or impair any responsibility or obligations assumed by the Contractor under or in connection with this contract; and the Contractor shall at all times maintain protection to safeguard the public and all persons engaged in the work, and shall take precautions as will accomplish such end, without undue interference to the public. The Contractor shall be responsible for and pay for any damage to adjacent roadways or structures resulting from work executed under this Section.
- H. General Blasting Procedures
 - 1. The time during which explosives may be used is restricted to Monday through Thursday between the hours of 9:00 AM and 2:00 PM (prevailing time) allowing ample time for cleanup. The use of explosives is not

permitted on Friday, weekends (Saturday or Sunday), holidays, on the eve of a holiday nor between the hours of 2:00 PM and 9:00 AM. In order to minimize traffic disruptions, the Contractor shall schedule blasting such that any two successive blasts detonated anywhere on the project are separated by at least 2 hours.

- 2. Drill and blast a single line of holes in vertical face of rock at end of trench, when shattering rock at ends of pipe or elsewhere as indicated. Provide minimum depth drillholes of 4 feet and maximum spacing of 18 inches on center. Use sufficient explosive to shatter rock for future excavation. Complete shattering before any pipe or fitting is placed within 50 feet of rock to be shattered.
- 3. Immediately after blasting, the Contractor shall provide equipment to the site to clear the pavement of blasted rock. The Contractor shall also use a mechanical sweeper and water spray to control dust and small stones.
- 4. The Contractor shall advise the Owner and Engineer at least two working days in advance of the dates on which he proposes to perform blasting operations, giving the approximate hour, for the Engineer's approval. The Contractor will be responsible for obtaining the permits and police officials required to close local streets during periods of blasting. The Contractor shall notify the Owner and Engineer by noon of the day prior to any day he plans not to blast where the weekly schedule shows a day of blasting. This does not include changes due to weather or unexpected equipment breakdowns.
- 5. Blast hole diameter shall be no greater than 3 inches.
- 6. No free flowing, pourable or pumpable explosives shall be used. All explosives shall be in cartridges or other semi-rigid container.

I. DISPOSAL OF ROCK AND BOULDERS

- A. Fragmented rock with dimensions not exceeding 6-in in any direction may be mixed with common fill, providing compaction requirements will not be compromised.
- B. Rock and boulders may be crushed and screened for reuse in the Work, provided that the resultant materials meet the requirements for gravel borrow, processed gravel, or crushed stone as specified in Section 02200.
- C. Unused rock and boulders shall be removed and disposed of off-site.

END OF SECTION 02212

SECTION 02273

GEOTEXTILES

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes the following:
 - 1. Providing geotextile fabric in foundation preparation for separation of existing soil from screened gravel or crushed stone beneath structures.
 - 2. Placing the geotextile fabric as temporary road reinforcement and riprap separation at pipe outlets, swales, and slopes, and as otherwise indicated or specified.
 - 3. Placing geotextile geogrid for soil amendments. Typically, geogrid will be used with retaining wall, foundations, and roadways.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section, and.
 - 1. Section 02020 EROSION AND SEDIMENT CONTROL
 - 2. Section 02140 DEWATERING
 - 3. Section 02200 EARTHWORK

1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 SUBMITTALS:
 - 1. At least two weeks prior to shipment, submit manufacturer's certificate of compliance and physical property data sheet indicating that requirements for materials and manufacture are in conformance as specified.
 - 2. For informational purposes only, submit manufacturer's printed installation instructions.
- 1.4 QUALITY ASSURANCE
 - A. General:

- 1. Producer of geotextiles to maintain competent laboratory at point of manufacture to insure quality control in accordance with ASTM testing procedures. Laboratory to maintain records of quality control results.
- 2. Do not expose geotextiles, except the geotextile fabric for silt fence, to ultraviolet radiation (sunlight) for more than 14 days total in period of time following manufacture until geotextile fabric is installed and covered with fill or backfill material.
- 3. Take all precautions to protect geotextile fabric from damage resulting from any cause. Either repair or replace geotextile fabric to Engineer's satisfaction at no additional cost to the Owner.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Provide in accordance with manufacturer's recommendations.
- B. Provide geotextile fabric in rolls wrapped with protective covering to protect geotextile fabric from mud, dirt, dust, and debris. Label each roll of geotextile fabric with number or symbol to identify production run.
- C. Protect geotextile fabric from sunlight during transportation and storage. Do not leave geotextile fabric exposed to sunlight for more than two weeks during installation operations.

PART 2 - PRODUCTS

2.1 NON-WOVEN GEOTEXTILE FABRIC

- A. Provide the following nonwoven (4.5 ounce per square yard) geotextile fabric, Model # US 120NW as manufactured by US Fabrics or approved equal.
- B. Geotextile fabric shall conform to test requirements for minimum average roll value (weakest principle direction) for strength properties of any individual roll tested from manufacturing lot or lots of particular shipment in excess of minimum average roll value (weakest principle direction) as specified hereafter:
- C. Physical Properties of Minimum Average Roll of the 4.5-ounce per square yard nonwoven geotextile fabric shall be:

		ASTM		
	Property	Test Method	Units	Value
1.	Tensile Strength	D4632	lbs	120
2.	Elongation at Break	D4632	%	50
3.	Trapezoidal Tear Strength	D4533	lbs	50
4.	Puncture Strength	D4833	lbs	70
5.	Permittivity	D4491	Sec ⁻¹	1.5
6.	Apparent Opening Size	D4751	Sieve #	70

7.	Mullen Burst Strength	D3786	Psi	230
8.	UV Resistance %Retained	D4355	%	70
9.	Flow Rate	D4491	Gal/mins/sf	120

2.2 GEOGRID

- A. Provide the following geogrid geotextile, Model Biaxial Geogrid BX1500 as manufactured by Tensar Corp. or approved equal.
- B. Geogrid shall conform to test requirements for minimum average roll value (weakest principle direction) for strength properties of any individual roll tested from manufacturing lot or lots of particular shipment in excess of minimum average roll value (weakest principle direction) for the model specified.

PART 3 - EXECUTION

3.1 GEOTEXTILE FABRIC INSTALLATION

- A. Install geotextile fabric in accordance with manufacturer's printed instructions.
- B. Place geotextile fabric on the foundation subgrade prior to placing the screened gravel or crushed stone.
- C. Overlap geotextile fabric 18 inches minimum for unsewn lap joint.
- D. Do not permit traffic or construction equipment to travel directly on geotextile fabric.
- E. Place geotextile fabric in relatively smooth condition to prevent tearing or puncturing. Lay geotextile fabric loosely but without wrinkles or creases so that placement of the backfill materials will not stretch or tear geotextile fabric. Leave sufficient slack in geotextile fabric around irregularities to allow for readjustments.
- F. Patch all tears in geotextile fabric by placing additional section of geotextile fabric over tear with a minimum of 3 feet overlay.
- G. Extend the geotextile fabric and wrap around the screened gravel or crushed stone along the perimeter of the foundation.

3.2 GEOTEXTILE GEOGRID INSTALLATION

- A. Install geogrid in accordance with manufacturer's printed instructions.
- B. Store geogrid roll in a manner that prevents excessive mud, wet concrete, epoxy, or other deleterious materials from coming into contact with the geogrid. Store geogrids above -20°F and avoid handling below 14°F.
- C. Prepare the site with a smooth grade and compact the soils using appropriate compaction equipment.

- D. Place geogrid in position and manually unroll the material over the prepared surface. Unroll the geogrid in the direction of travel so that the roll is parallel with traffic patterns.
- E. Cut and overlap the geogrid to accommodate curves. Cutting may be done with sharp shears or handheld power saws. Cut geogrid to conform with manholes and other immovable protrusions. Overlap shall be in accordance with manufacturer requirements.
- F. Anchor geogrid in place to maintain alignment and overlaps. This may be done with small piles of backfill and heavy-gauge staples.
- G. Pull the geogrid taught to remove wrinkles and lay down slack with hand tension, then secure in place.
- H. Min. 6-inches of backfill shall be placed over the geogrid. Standard compaction methods may be used unless the soil is soft, as determined by the Engineer.

3.2 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700.

END OF SECTION 02273
TRASH RECEPTACLES

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the trash and recycling receptacles.
- 1.2 RELATED SECTIONS
 - A. Drawings and general provisions of DIVISION 0 BIDDING AND CONTRACT REQUIREMENTS and other DIVISION 2 Specification Sections, apply to this section.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
 - 1. Provide for fabrication and erection of receptacles.
 - 2. Provide colors available for Owner selection.
 - 3. Include plans, elevations, and large-scale sections of typical members and other components.
 - 4. Show anchors, grounds, reinforcements, accessories, layout, and installation detailes.

PART 2 – PRODUCTS

- 2.1 TRASH RECEPTACLE
 - A. Shall be as manufactured by MassCor or approved equal. Shall be opened with a lid top with chain for lid top and rain bonnet.
 - B. Trash Receptacle colors shall be as selected by Owner.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General:
 - 1. Install trash and recycling receptacles at the location provided by the Engineer.
 - 2. Installation shall be on level hardened surface.

SIGNAGE

PART 1 – GENERAL

1.1 SUMMARY

- A. This Section includes the signage and accessories. Work includes parking, driveway, and site signs.
- 1.2 RELATED SECTIONS
 - A. Drawings and general provisions of DIVISION 0 BIDDING AND CONTRACT REQUIREMENTS and other DIVISION 2 Specification Sections, apply to this section.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
 - 1. Provide for fabrication and erection of signs.
 - 2. Include plans, elevations, and large-scale sections of typical members and other components.
 - 3. Show anchors, grounds, reinforcements, accessories, layout, and installation detailes.
 - 4. Provide message list for each sign required, including large-scale wording details and lettering layout.
 - 5. For signs supported by or anchored to permanent construction, provide setting drawings, templates, and directions for installation of anchor bolts and other anchors.

1.4 QUALITY ASSURANCE

A. Single source responsibility: For each separate type of sign required, obtain signs from one source from single manufacturer.

PART 2 – PRODUCTS

2.1 ALUMINUM SITE SIGNS

A. Aluminum Engineer Grade reflective on rust free aluminum. Material thickness shall be 0.08", corner radius 1-1/2", 2-mount holes 13/8". Temperature range shall be between -10° F and 130° F. 3M Anti-graffiti over laminate. Road and parking signs shall meet MUTCD and MassDOT requirements as manufactured by Brimar Industries, or approved equal.

B. Informational signs shall include a white border, brown background, and white lettering.

2.2 ALUMINUM SIGN SUPPORT SYSTEM

- A. Sign posts shall be 2" x 2" galvanized steel conforming to ASTM A1011 Grade 50 and ASTM A-653 with 7/16" Pre-punched holes. Sign posts shall be breakaway. Posts shall be Telespar signposts as manufactured by Brimar Industries or approved equal.
- B. Post shall include all accessories, including tamperproof rivets, bolts, nuts, and washers.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. General:
 - 1. Locate sign units and accessories where indicated, using mounting methods of type described and according to manufacturer's instructions.
 - 2. Install required permitting signage in visible area and in accordance with the permit requirements.
 - 3. Install signs level, plumb, and at height indicated, with surfaces free from distortion or other defects in appearance.
- B. Post Installation:
 - 1. Install posts a minimum of 36". Breakaway anchor posts shall be install 32" into the ground.

PAVEMENT

PART 1 – GENERAL

1.1 SCOPE OF WORK

A. This Section includes the removal and replacement of existing bituminous concrete pavement and sub-base; installation of temporary pavement; milling and installation of permanent pavement overlay; removal and replacement of curb and gutter (as required); removal and resetting of curbing (as required); raising and adjusting castings and valve boxes; installation of pavement markings, and permeable paver installation.

1.2 REFERENCE STANDARDS

- A. Except as otherwise specified herein, the current Standard Specifications for Highways and Bridges, including all addenda, issued by the Commonwealth of Massachusetts, Department of Public Works, shall apply to materials and workmanship required for the Work of this Section.
- B. American Association of State Highways and Transportation Officials (AASHTO) AASHTO M144 - Standard Specification for Calcium Chloride.
- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.3 SUBMITTALS

- A. Shop Drawings: Submit the following in accordance with Section 01300 SUBMITTALS.
 - 1. Product Data: Submit complete data on materials to be used in construction, including gradation tests for granular base.
 - 2. Design Data: Submit design mix for bituminous base and top (wearing) course.
 - 3. Material Certificates: Provide copies of materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.

1.4 QUALITY ASSURANCE

- A. Provide in accordance with Section 01400 and as specified.
- B. Laboratory Testing Required:
 - 1. The bituminous mixture shall be compacted to at least 95% of the density achieved on the laboratory testing of the design mix for the project. The density of the Bituminous Concrete Pavement will be determined by using either the following tests; Nuclear Density Gauge Method ASTM D2950 or the Bulk Specific Gravity Method AASHTO-T166.
 - 2. Permeable pavers shall be tested in accordance with ASTM C936 for compression testing, absorption, freeze-thaw and abrasion.
- C. Thickness: Test in-place asphalt concrete courses for compliance with requirements for thickness. Repair or remove and replace unacceptable paving as directed by Engineer. In-place compacted thickness will not be accepted if exceeding the following allowable variation from required thickness:
 - 1. Base Course: ¹/₄-inch, plus no minus
 - 2. Top Course: ¹/₄-inch, plus no minus

1.5 PROJECT/SITE CONDITIONS

- A. Environmental Requirements:
 - 1. Do not place materials when underlying surface is muddy, frozen, or has frost, snow, or water thereon.
 - 3. Do not place concrete when air temperature at time of placement, or anticipated temperature for following 24 hours, is lower than 40°F or higher than 90°F.
 - 4. Apply prime and tack coats when ambient temperature is above 50°F and when temperature has not been below 35°F for 12 hours immediately prior to application.
 - 5. Binder Course may be placed when air temperature is above 30°F and rising.
 - 6. Grade Control: Establish and maintain required lines and elevations.
- B. Existing Conditions:
 - 1. Drawings show approximate locations of paving areas.
 - 2. Drawings show approximate location of existing structures along pipeline route.

1.6 GUARANTEE

A. All final pavement placed shall be warranted by the Contractor for a period of two (2) years. During this period all areas which have settled or are unsatisfactory for traffic shall be removed and replaced at no cost to the Owner, including the cost of Traffic Police. Settlement in excess of one (1) inch shall be considered significant, and shall be repaired.

PART 2 – PRODUCTS

2.1 BITUMINOUS CONCRETE

- A. Calcium chloride shall conform to AASHTO M144, Type I or Type II.
- B. Bituminous concrete shall conform to Class I Bituminous Concrete Pavement, Type I-1, of Section 460 of the Massachusetts Highway Department Standard Specifications.
- C. Binder Course and Modified Top Course shall conform to the Massachusetts Highway Department Standard Specifications, Section M3.11.00, Class I, bituminous concrete.
- D. Tack coat shall be emulsified asphalt, grade RS-1 and conform to the Massachusetts Highway Department Standard Specifications, Section M3.03.0.
- E. Cutback asphalt shall conform to the Massachusetts Highway Department Standard Specifications, Section M3.02.0.
- F. Sub-base material shall be new processed gravel conforming to the Massachusetts Highway Department Standard Specifications, Section M1.03.1 "Processed Gravel for Sub-Base".

2.2 PERMEABLE PAVERS

- A. Permeable pavers shall be Turfstone as manufactured by Unilock or Belgard, or approved equal.
- B. The pavers shall be placed in running bond pattern (3/4 offset) with a void space of 40% and a thickness of 3-1/8". Pavers shall have a minimum compressive strength of 7,200-psi average. The dimensional accuracy shall be +/- 3mm.
- C. Permeable paver edging shall be StructureEdge as manufactured by Permaloc or approved equal. Edging shall be extruded aluminum 6063 alloy t6 hardness for restraint edging for straight-line and curvilinear applications. Thickness shall be 3/16" gage sections with 0.210" thick exposed top lip. Section ends shall splice together with a sliding connector. Anchoring shall be with 3/8"x10" bright spiral steal spikes with plastic washers. Edge restraint shall be installed along the perimeter of the interlocking pavers or where there is a change in pavement material. Pavers

require a finish elevation (after second compaction) of 1/4"(6mm) above the top of the restraint. The base material should always extend beyond the restraint. Install edge restraints per manufacturer's recommendations.

D. Permeable paver <u>geogrid</u> shall be Tenax LBO 330 biaxial grid, Tensar BX1500 or approved equal. Install geogrid in accordance with manufacturer's printed instructions. Refer to section 02273 for submittal and addition installation requirements.

PART 3 – EXECUTION

3.1 BITUMINOUS CONCRETE GENERAL

- A. After completion of the backfilling and installation of temporary trench pavement, final pavement shall not be placed until the temporary paving has been in place for at least 120 days, unless otherwise directed in writing by the Engineer.
- B. Materials for pavement shall be mixed, delivered, placed, compacted, and tested in accordance with the referenced Specification, Sections M3.11 and 460 and as specified herein.
- C. Whenever the sub-base becomes dry enough to cause dust problems, spread calcium chloride uniformly over the gravel surface in sufficient quantity to eliminate the dust.
- D. No vehicular traffic or loads shall be permitted on the newly completed pavement until adequate stability has been attained and the material has cooled sufficiently to prevent distortion or loss of fines. If the climatic or other conditions warrant it, the period of time before opening to traffic may be extended at the discretion of the Engineer.
- E. Pavement Construction Period. No pavement shall be constructed during the period from November 15 to April 1 without approval in writing from the Engineer.

3.2 BITUMINOUS CONCRETE PREPARATION

- A. Protection of existing Roadways:
 - 1. Saw cut existing pavement to required width and depth to avoid damage to adjacent pavement, curbs, gutters, or other structures and as indicated on the Drawings.
- B. Sub-Surface Preparation:
 - 1. Pavement Sub-base:

- a. Pavement sub-base material shall be as specified in Section 02200, and as shown on the Drawings.
- b. The sub-base to be placed under pavement shall be a minimum of 12inches thick after compaction. Sub-base shall be evenly spread and thoroughly compacted in accordance with the Contract Documents. The sub-base shall be spread in layers not more than 8 - inches thick except the last layer of gravel shall be 4-inches thick, compacted measure. All layers shall be compacted to not less than 95 percent of the maximum dry density of the material as determined by ASTM D1557 Method C at optimum moisture content.
- c. Complete sub-base preparation, including dynamic compaction, for full width before placing surfacing materials.
- 2. Subgrade:
 - a. Prepare subgrade in accordance with Section 02200.
 - b. Complete subgrade preparation, including dynamic compaction, for full width before placing surface materials.
 - c. Stabilize subgrades in accordance with Section 02200 so that loaded construction vehicles do not cause rutting or displacement when depositing materials.

3.3 BITUMINOUS CONCRETE INSTALLATION

- A. General
 - 1. Pavement depths shall be as shown on Drawings or as specified herein.
 - 2. Place bituminous concrete mixture on prepared surface, spread, and strikeoff. Spread mixture at minimum temperature of 225 °F (107 °C). Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness. Protect all adjacent construction from staining with mix or damage by mechanical equipment. Clean, repair, or replace any construction stained or damaged at no additional cost to the Owner.
- B. Temporary trench pavement:
 - 1. In all locations specified in the Contract Documents or determined by the Engineer, an initial layer of temporary trench pavement shall be placed wherever existing pavement has been removed at the end of each working day. Depth of temporary trench pavement is indicated on the Drawings.

- 2. The pavement sub-base shall be excavated, graded, and compacted to a depth below the existing pavement (see Drawings for depths).
- 3. Hose clean with water all road surfaces adjacent to the area to be paved. No paving is to be placed until sub-base surface is dry.
- 4. The temporary trench pavement layer shall be a hot mixed binder course placed and compacted to a thickness identified on the Drawings by steel-wheeled rollers of sufficient weight to thoroughly compact the bituminous concrete without damaging the existing pavement.
- 5. The temporary trench pavement shall be placed and compacted to a thickness identified on the Drawings. The temporary pavement shall be rolled smooth and even with the existing pavement.
- 6. The finished surface, after compaction, shall be true to the established line and grade of the existing pavement.
- 7. Temporary trench pavement shall be placed daily over all trenches or as directed by the Engineer.
- C. Permanent trench pavement:
 - 1. For areas with temporary pavement, permanent trench pavement shall be placed after the 90-day settling period. The temporary trench pavement and sub-base shall be excavated, graded, and compacted to a depth below the existing pavement (see Drawings for depths).
 - 2. For areas not receiving temporary pavement, permanent trench pavement shall be placed wherever existing pavement has been removed or disturbed at the end of each working day.
 - 3. Depth of permanent trench pavement is indicated on the Drawings.
 - 4. The existing pavement shall be saw-cut, removed and properly disposed of one foot beyond the limits of temporary trench pavement to create an offset subbase joint. All pavement edges shall be square and straight. Irregular, jagged edges will not be allowed.
 - 5. Hose clean with water all road surfaces adjacent to the area to be paved. No paving is to be placed until sub-base surface is dry.
 - 6. The permanent trench pavement layer shall be a hot mixed binder course placed and compacted to a thickness identified on the Drawings by steel-wheeled rollers of sufficient weight to thoroughly compact the bituminous concrete without damaging the existing pavement.

- 7. The top course shall be placed and compacted to a thickness identified on the Drawings. The new pavement shall be rolled smooth and even with the existing pavement.
- 8. The binder course shall be placed by normal construction practices. The top course shall be machine laid utilizing a sidewalk box spreader or equal; no hand work is allowed. Prior to top course all seams shall be sealed with an approved emulsified liquid asphalt and sand. The top course of the permanent trench paving shall be placed to a grade that shall not overlap the existing pavement.
- 9. The finished surface of the top course mixture, after compaction, shall be true to the established line and grade of the existing pavement.
- D. Mill and permanent pavement overlay: areas receiving full width overlay
 - 1. Preparation for permanent pavement overlay shall include milling, sweeping the existing and temporary pavement, from road edge to road edge. Areas of milling and overlay will be determined by the Engineer prior to placement.
 - 2. All pavement edges shall be square and straight. Irregular, jagged edges will not be allowed.
 - 3. All pavement edges shall be painted with cutback asphalt, and all surfaces with tack coat, to insure a satisfactory bond between old and new pavement. Tack coat and cutback asphalt shall be applied immediately prior to placement of overlay pavement.
 - 4. Permanent pavement overlay shall consist of one course (top course) of bituminous concrete at 1.5 inches of compacted thickness.
 - 5. The overlay shall meet existing pavement at the same grade without overlapping or feathered edges. Transitions to existing pavement shall include a 2-inch depth keyway at the locations shown on the Drawings.
- E. Pavement Placement
 - 1. Unless otherwise permitted by the Engineer for particular conditions, only machine methods of placing shall be used. Methods other than machine methods may be used, at no additional cost to the Owner. The equipment for spreading and finishing shall be mechanical, self-powered pavers, capable of spreading and finishing the mixture true to line, grade, width, and crown. The mixtures shall be placed and compacted only at such times as to permit proper inspection and checking by the Engineer.
 - 2. After the paving mixtures have been properly spread, initial and immediate compaction shall be obtained by the use of steel rollers having a weight of not less than 240 pounds per inch width tread. Begin rolling when mixture will

bear roller weight without excessive displacement. Compact mixture with hot tampers or vibrating plate compactors in areas inaccessible to rollers. Accomplish breakdown rolling and repair displaced areas by loosening and filling, if required, with hot material. Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.

- 3. Final rolling of the pavement shall be performed by a steel wheel roller weighing not less than 285 pounds per inch width of tread at a mix temperature and time sufficient to allow for final smoothing of the surface and thorough compaction. Continue rolling until roller marks are eliminated and course has attained maximum density.
- 4. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot bituminous concrete. Compact by rolling to match surrounding surface density and smoothness.
- 5. Immediately after placement of new pavement, make joints between existing and new pavements, or between successive days' Work, to ensure continuous bond between adjoining Work. Construct joints to have same texture, density, and smoothness as other section of bituminous concrete course. Clean contact surfaces and apply tack coat. All joints between the existing and new pavements shall be keyed on an angle (4' x 10') or as approved by the Owner, and shall be sealed with bitumen RS-1 and sanded.
- 6. The Contractor shall furnish and install paving to provide transition or aprons for driveways and walkways impacted by new pavement installation.
- F. Pavement Markings:
 - 1. The Contractor shall replace all reflectorized pavement markings removed or covered-over in carrying out the Work, and as directed by the Engineer, no sooner than 48 hours after completion of overlay pavement. The markings shall be painted markings, 6-inches wide, white or yellow, single or double lines as required. Materials shall be reflectorized epoxy pavement markings conforming to MassDOT Engineering Directive E-05-003, dated June 16, 2005 and to MassDOT standard Section 860.
 - 2. The Contractor shall provide temporary markings on the temporary pavements where existing markings are removed at no additional cost to the Owner.
- H. Curb and Gutter Replacement:
 - 1. Replace curb and gutter with same material to pre-construction lines and curb sections. Reset granite curb to pre-construction line and grade.

- 2. Removal and replacement of curbing shall be done in accordance with Sections 501 and 580, as applicable of the MHD Specifications for Highways and Bridges.
- 3. Provide expansion joints at each intersection with existing curb sections.
- 4. Use expansion joints one inch wide. Fill with expansion joint material and cut to shape of curb section.
- I. Sidewalk and Driveway Replacement:
 - 1. Gravel sidewalks:
 - a. Gravel sidewalks shall be restored to a condition at least equal to that existing immediately before the Work was started.
 - 2. Bituminous concrete sidewalks and driveways:
 - a. Construct in accordance with MHD Section 701, Sidewalks, Wheelchair Ramps and Driveways.
 - b. The subgrade shall be shaped parallel to the proposed surface of the sidewalk or driveway and shall be thoroughly rolled and tamped. All depressions occurring shall be filled with suitable material and again rolled or tamped until the surface is smooth and hard in order for a gravel foundation to be placed upon it.
 - c. The sidewalk or driveway shall be a minimum of 3.5 inches compacted inches thick, laid in two equal courses (2-in binder course and 1.5-in top course).
 - d. Sidewalk cross slopes can not exceed 2 percent as required by the Americans with Disabilities Act (ADA). The Contractor shall merge new sidewalk slopes into existing sidewalk slopes as required by ADA.
 - 3. Cement concrete sidewalks, and driveways:
 - a. Construct in accordance with MHD Section 701, Sidewalks, Wheelchair Ramps and Driveways.
 - b. Use 6x6, W10xW10 welded wire reinforcement.
 - c. Concrete sidewalks shall be 4-inches thick and concrete driveways shall be 6-inches thick.
 - d. The subgrade for the walk or driveway shall be shaped to a true surface conforming to the proposed slope of the walk, thoroughly rolled at optimum moisture content, and tamped with a power roller weighing

not less than one ton and not more than 5 tons. All depressions occurring shall be filled with suitable material and again rolled or tamped until the surface is smooth and hard.

- e. After the subgrade has been prepared, a sub-base of gravel at optimum moisture content shall be placed, thoroughly rolled by a power roller, and tamped. The gravel shall be a minimum of 8 inches in thickness.
- f. The forms shall be smooth, free from warp, strong enough to resist springing out of shape, and deep enough to conform to the thickness of the proposed walk or driveway. All mortar or dirt shall be completely removed from forms that have been previously used. The forms shall be well staked, thoroughly braced, and set to the established lines with their upper edge conforming to the grade of the finished walk or driveway.
- g. The finished surface shall have sufficient pitch from the outside edge to provide for surface drainage. This pitch shall be 1/4 of an inch per foot unless otherwise directed by the Engineer. Before the concrete is placed, the sub-base for sidewalks shall be thoroughly dampened until it is moist throughout but without puddles of water.
- 4. General:
 - a. Valve boxes, manhole frames, and all other castings shall be carefully set to the proposed finished grades.
- J. Berms and Waterways
 - 1. Bituminous curbing shall be replaced as required. Curbing shall be machine laid and conform to grade of roadway and adjacent curb areas.
 - 2. Bituminous berms shall be replaced as required. Berms shall be machine laid and conform to the grade of the roadways. Berms shall be placed in accordance with MHD Specification 470.20.
 - 3. Bituminous waterways which have been disturbed by construction operations shall be repaired or replaced. The waterways shall be repaired and constructed in accordance with the applicable requirements of Section 280 of the MHD Specifications. Waterways shall be placed in two 1-1/2-inch thick courses on a prepared gravel base. Material shall be compacted by tamping or rolling.

3.4 BITUMINOU CONCRETE PROTECTION

- A. Protect replacement Work with barricades or other devices as approved by Engineer so that no damage occurs as a result of subsequent construction operations.
 - 1. After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

2. Repair damages or other irregularities to satisfaction of Engineer, at no additional cost to the Owner, before final acceptance by the Engineer.

3.5 PERMEABLE PAVEMENT INSTALLATION

- A. Prepare subbase as shown on the Design Drawings.
- B. Place permeable pavers on the prepared subbase. A two-man clamp is recommended. Place blocks flush with no gaps in an off-set pattern to the final grading shown on the Design Drawings.
- C. Fill all holes with topsoil or crushed stone as shown on the Design Drawings.
- D. Install paver edging as recommended by the manufacturer.
- E. Compaction shall be completed with a "rubber-roller" compactor to reduce risk of block breakage.
- F. Seed all areas shown on the Design Drawings that will receive loam and seeding.

3.6 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700.

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STORM DRAINAGE SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment and supervision necessary to complete the work specified in this Section or shown on the Contract Drawings, or both, but not limited to the following:
 - 1. Storm drainage piping, fittings, accessories and bedding.
 - 2. Catch basins and catch basin frames and grates.
 - 4. Drain manholes and drain manhole frames and covers.

1.2 SUBMITTALS

- A. Submit shop drawings and manufacturer's specifications and installation instructions for all pipe materials, precast concrete catch basins and drain manholes, manhole frames and covers and catch basin frames and grates. Include component construction, features, configuration, and dimensions.
- B. Each shipment of pipe, catch basins and manholes shall be accompanied with the manufacturer's notarized certificate that the materials meet the specification requirements.
- C. Pipe, manholes, connections, anchorage, and accessories as required for complete installation of stormwater system.

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. C32 Sewer and Manhole Brick (Made from Clay or Shale)
 - 2. C76 Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe. (Latest version)
 - C139 Concrete Masonry units for Construction of Catch Basins and Manholes. (Latest version)
 - 4. C270 Mortar for Unit Masonry. (Latest version)
 - 5. C361 Reinforced Concrete Low-Head Pressure Pipe. (Latest version)

- 6. C443 Joints for Concrete Pipe and Manholes, Using Rubber Gaskets. (Latest version)
- 7. C478 Precast Reinforced Concrete Manhole Sections. (Latest version)
- 8. C923 Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes and Laterals. (Latest version)
- 9. C990 Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants. (Latest version)

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials shall conform to the latest version of the MassDOT Standard Specifications, as amended, and policies and technical guidance in DEP's Stormwater Management Standards and the Massachusetts Stormwater Handbook.

2.1 PIPE MATERIALS

- A. High Density Polyethylene (HDPE) Pipe. The pipe shall conform to MassDOT Section M5.03.10. Pipe shall be smooth interior wall and corrugated exterior wall, and be water-tight. Pipe shall be minimum 12-inch diameter. Ends shall be bell-and-spigot unless approved by the DPW for the specific application. Pipe shall comply with the requirements for test methods, dimensions and markings found in AASHTO Designations M252 and M294. Pipe shall support an HS-20 live load with a maximum deflection of 5% of the minimum pipe diameter. Pipe and fittings shall be made from virgin polyethylene compounds which conform to the applicable current edition of the AASHTO Material Specifications for cell classification as defined and described in ASTM D3350. Nominal sizes of 12- to 60-inch shall be either AASHTO Type 'S' or Type 'D.'
- B. Reinforced Concrete Pipe: Pipe and flared ends shall conform to the AASHTO M170 for Standard Strength Reinforced Concrete Culvert Pipe for class III Pipe, Wall B. or ASTM C76 for Reinforced Concrete Culvert and Storm Drain Pipe. All pipe 24 inches in diameter or smaller shall be of the bell and spigot type. Pipes larger than 24 inches in diameter shall be tongue and groove or bell and spigot. A preformed flexible plastic sealing compound of Butyl Mastic Rope Sealer "1" size, "EZ Stick" as manufactured by Concrete Products supply or an approved equal shall be used for sealing water-tight joints.
- C. Polypropylene (PP) Pipe: Pipe shall have a stiffness of 46 psi when tested in accordance with ASTM D2412. Pipe with 12" up to 30" ID shall have smooth interior wall and corrugated exterior wall, and be water-tight. Pipe from 30" to 60" ID shall have smooth interior wall and exterior wall with annular inner corrugations, and be water-tight to meet ASTM D3212. Pipe shall be minimum 12-inch diameter.

Ends shall be bell-and-spigot unless approved by the DPW for the specific application. Pipe shall comply with the requirements for test methods, dimensions and markings found in AASHTO Designations M252 and M294. Pipe shall support an HS-20 live load with a maximum deflection of 5% of the minimum pipe diameter. Pipe and fittings shall be made from virgin polypropylene compounds which conform to the applicable current edition of the AASHTO Material Specifications as defined and described in ASTM D4101. Nominal sizes of 12- to 60-inch shall be either AASHTO Type 'S' or Type 'D.'

- D. Polyvinyl Chloride (PVC) Pipe, SDR21 for Shallow Bury:
 - 1. Shallow bury shall be defined as pipe with less than 2-feet of cover.
 - 2. <u>SDR 21 PVC Pipe for Shallow Bury</u> shall be push-on joint, bell and spigot type with pressure rating of 200 psi. For sizes 1-1/2-inch to 12-inch diameter, drain pipe shall be SDR 21 PVC meeting the requirements of ASTM D-2241, with material per ASTM D-1784, Grade 1, Type 1. Joints to meet ASTM F477 and shall be tested to ASTM D-3139 standard.
 - 3. <u>Joints</u>:
 - i. All joints are to be made water-tight.
 - ii. Pipe shall be jointed in strict accordance with the pipe manufacturer's instruction. Jointing of all pipe shall be done entirely in the trench.
 - iii. Lubricant for jointing of ball and spigot PVC pipe shall be applied as specified by the pipe manufacturer. Use only lubricant supplied by the pipe manufacturer.
 - iv. Ball and spigot PVC pipe shall be pushed home by hand or use of bar and clock. The use of power equipment such as a backhoe bucket is not recommended and shall only be used at the direction of the manufacturer.
 - v. To join field-cut pipe, pipe shall be cut square. The cut end of the pipe surface shall be properly beveled to the size and shape of a factory-finished beveled end. All sharp edges shall be rounded off.
- E. Polyvinyl Chloride (PVC) Pipe, SDR35:
 - 1. PVC drain pipe shall be push-on joint SDR 35 PVC meeting the requirements of ASTM D3034 for sizes 3-inch to 15-inch. For sizes greater than 15-inch, pipe shall comply with ASTM F679, latest record. Pipe color shall be in accordance with the uniform color code established by the APWA Utility Location and Coordination Council.

- 2. <u>Fittings</u>: Fittings, couplings and adaptors shall be manufactured by Romac Industries Inc., or approved equal.
- 3. <u>Joints</u>: PVC pipe shall have an integral wall bell and spigot push-on joint with elastomeric gaskets secured in place in the bell of the pipe. The bell shall consist of an integral wall section with a solid cross section elastomeric gasket, factory assembled, securely locked in place to prevent displacement during assembly. Elastomeric gaskets shall conform to ASTM D3212. Where petroleum contamination is known or suspected to be in the soil and/or groundwater, nitrile gaskets shall be required.
- 4. <u>Spigot Pipe Ends</u>: Spigot pipe ends shall be supplied with bevels from the manufacturer to ensure proper insertion. Each spigot end shall have an "assembly stripe" imprinted thereon to which the bell end of the mated pipe will extend upon proper joining of the two pipes.
- 5. <u>Insulation</u>: Extruded closed-cell rigid formed polystyrene, equal to "Styrofoam: HI-60" by Dow Chemical. Size is 2-inch thick by 4 feet wide.
- F. General: Elbows, tees, reducing tees, wyes, couplings, increasers, crosses, transitions and end caps of same-type class of materials as piping unless otherwise indicated.

2.2 MANHOLES AND CATCH BASINS

- A. The material to be used in the construction of storm drain manholes, catch basins, and drop inlets shall conform to MassDOT Standard Specifications, the Drawings, and these specifications. Design depths as indicated on the Contract Drawings.
- B. Manholes over 12 feet in depth shall have minimum of 5 feet inside diameter. When drop manholes are used the drop shall not be more than 3 ½ feet. Risers shall be brick, not concrete blocks. Risers shall be clay or shale brick, and shall conform to the requirements of AASHTO M 91, Grade MM or as specified in MassDOT M4.05
- C. Precast Concrete Manholes: Precast Manholes shall be constructed of reinforced precast concrete monolithic base section, barrel section and dome section meeting the latest applicable requirements of ASTM C478 I and AASHTO M 199, or latest revision thereto. Special manholes shall also meet the requirements of 2016 Edition March 2016 Drainage Construction Standards 4-4 MassDOT Standard Specifications, section M4.02.14, Precast Units. After curing a minimum of 14 days, the outside surface of the tapered or cone section of precast cement concrete drainage structures shall be dried and cleaned. Tongue and groove sections between barrel sections shall be mortared or use butyl rubber sealants. Live load design shall be H-20 loading. A 26-inch opening will be cast in the top section to accept a standard cast iron frame and cover. Inside diameter shall be a minimum of 4 feet.
- D. Precast Concrete Catch Basins: Precast Catch Basins shall conform to ASTM C478 and AASHTO M 199, or latest revision thereto. A 12-inch opening shall be left in center of the precast base section and filled with washed, screened gravel and left

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open except when the catch basin is placed in an area of high groundwater. Precast units shall have 2 weep holes built into the walls at floor level of new basins placed in areas above the seasonal high groundwater table. Each weep hole shall consist of 4inch pipe or equivalent opening to carry water through the wall of the structure. The ends of the pipe shall be left flush with the wall of the structure and covered with ¹/₄inch mesh galvanized wire screen 23 gauge satisfactorily fastened against wall. The drain weep hole shall be excavated and backfilled with 2 cubic feet of 1 ¹/₂-inch washed stone. Live load design shall be H-20 loading. Catch basins which are limited by height shall be installed with a flat top slab, cast in place, designed for H-20 loading and cast iron frame cast in place.

- E. Concrete Compressive Strength: 4000 psi minimum. Type II cement.
- F. Reinforcing Steel: ASTM A185, 0.12 sq. in./linear ft. and 0.12 sq. in. (both ways) base bottom.
- G. Joints sealed with hydraulic cement conforming to ASTM C990.
- H. Frames and Covers: Cast Iron shall meet requirements of ASTM A888 "Grey Cast Iron, Cast Iron Class 20." All castings shall be clean and without blow holes, sand holes or defects of any kind. Cast iron frames and covers shall be clean of all rust, dirt, and scale. Grates shall have the following wording cast into the outside borders: "Dump No Waste" and "Drains to Waterway". Text shall be bold capital letters, at least 1 inch high. Placement may be as per manufacturer.
- I. Manhole Covers: Manhole frames and covers shall be at least Class 25 conforming to ASTM A48 "Standard Specification for Gray Iron Castings." Manhole frame shall have a clear opening of 24 inches and be a minimum of 8 inches in height (unless otherwise specified on the Drawings). The surface of the cover shall have a diamond pattern with the words "DRAIN" cast thereon for drainage manholes, as manufactured by East Jordan Iron Works (formerly LeBaron Foundry Co.) (EJIW) 0MA211000024, or equal.
- J. Catch Basin Grates and Frames: Catch basin grate shall be 24-inch square grate, East Jordan Iron Works (formerly LeBaron Foundry Co.), 0MA552000075 or approved equal. Catch basin frames shall be East Jordan Iron Works (formerly LeBaron Foundry Co.), 0MA552000029 or approved equal. Frames shall be set upon a full bed of mortar, and mortar shall be brought up alongside of frame to provide a water-tight joint.
- K. Catch Basin Hoods: Catch basin hoods shall protrude no more than 12 inches beyond the end of pipe into the structure. Acceptable hoods are Ground Water Rescue Inc. Eliminator, Best Management Practices Inc. Snout® or equal.
- L. Granite Curb Inlets: Granite shall conform to MassDOT Standard Specifications Sections M9.04.0, M9.04.1, and M9.04.2. The back face for a distance of 3 inches down from the top shall have no projections greater than 1 inch. The front shall be straight split, free from drill holes, and shall have no projection greater than 1 inch or

depression greater than 1/2 inch for a distance of 10 inches down from the top. For the remaining distance there shall be no depression or projection greater than 1 inch. The ends shall be squared with the top for the depth of the face finish. The granite curb inlet shall be 6 feet in length, plus or minus 1/2 inch from 17 to 19 inches in depth, 6 inches wide at the top and at least 6 inches wide at the bottom. The reveal shall be 10 inches. Curb inlets set on a radius of 160 feet or less shall be cut to that radius. The gutter mouth at least 3 inches in depth and at least 2 feet in length shall be cut in the front face of the stone. If there is no other curbing, or as applicable, transitional curbing shall be required on both sides of the inlet. The transitional curbing shall be 6 feet in length, with a height equal to the inlet and tapering to grade at the end.

2.3 MASONRY MATERIAL

- A. Concrete Masonry Units: ASTM C139.
- B. Brick: ASTM C32, Grade MS or ASTM C62, Grade SW.
- C. Mortar: ASTM C270, Type II Cement.

2.4 PIPE BEDDING AND COVER MATERIALS

A. Bedding, Cover and Compaction Requirements: Fill Type as specified in Section 02200, and shown on the Details.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that the trench cut and excavation base is ready to receive work and excavations, dimensions, and elevations are as indicated on Contract Drawings.

3.2 PREPARATION

- A. Hand trim excavations to required elevations. Correct over excavation with processed gravel.
- B. Remove large stones or other hard matter, which could damage piping, structures, or impede consistent backfilling or compaction.

3.3 BEDDING

A. Excavate for pipe trench or structure in accordance with Section 02200. Hand trim excavation for accurate placement of pipe and structures to elevations indicated on the Drawings.

- B. Place bedding material at trench bottom, level materials in continuous layer not exceeding 12 inches compacted depth.
- C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.4 INSTALLATION - PIPE

- A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal joints watertight.
- B. The minimum flow line depth for drainage pipes shall be 4 feet. The minimum cover over drainage pipes shall be 3 feet below the pavement slab or as specified by the type of pipe per manufacturer's specifications, whichever is greater. Where the clearance is less than 1 foot below the pavement, provide a design method to maintain the integrity of the pipe and right of way. For drainage pipe outside of the pavement, the minimum cover shall be 18 inches or as specified by the type of pipe, whichever is greater.
- C. Drainage mains shall be located at least 5 feet horizontally from sewer mains. Locations with respect to water mains are described in the Water Standards portion of these Construction Standards. The distance shall be measured from inside edge of pipe. Drainage mains shall be laid to provide a vertical separation of at least 18 inches from either water or sewer lines. The minimum vertical separation is measured from outside of water or sewer main to outside of the storm drain main.
- D. RCP Pipe
 - 1. Pipe shall be carefully laid to the lines and grades as shown on the approved plans. The Contractor shall use laser beam aligning equipment.
 - 2. See Section 4.3.1 for bedding material. The bottom of the trench shall be excavated to a flat grade 6 inches below the pipe invert for trenches in suitable earth and 12 inches below pipe invert for trenches in rock. When rock or ledge is encountered it shall be removed to such widths as will give a clearance of at least 12 inches on each side of the pipe or other structure and a sand cushion used. The width of trenches shall be sufficient to allow thorough compacting of the refill adjacent to the lower quarters of the pipe.
 - 3. RCP Pipe Trenches shall meet MassDOT Standard Specifications Section 260 and MassDOT Construction and Traffic Standard Details Drawing 208.10.
 - 4. Trenches at pipe joints shall be excavated as necessary to give ample room for properly making and inspecting the pipe joints. RCP pipe joints shall be cement mortared (as specified in MassDOT Section M4.02) carefully placed in the joints around its entire perimeter and mixed relatively dry, in the ratio of one part cement to two parts sand.

- 5. Pipe bedding material shall be carefully and lightly tamped under pipe to provide uniform support. Fill to a minimum depth of 12 inches above the top of the pipe. Material for backfilling the rest of the trench, except for sub base (top 15 inches) shall be suitable, approved, material. The compaction process shall be material placed in 12-inch lifts and thoroughly compacted by mechanical rammers, vibrators, or other methods to be approved (e.g., hydraulic plate compactors) to 90 percent Modified Proctor density in offroad or nonstructural areas and 95% in roadway or structural areas. Bucket compaction will not be accepted.
- 6. When laying pipe in groundwater, pipe material and method of installation shall be approved by the Town. Water must not be permitted to rise in the trench until all pipes have been securely bedded, jointed and observed and until backfilling has progressed to an elevation at least one foot above the top of the pipe. Temporary plugs shall be installed in open ends of pipe to prevent silt from washing into pipe during construction; and open ends of the pipe shall be closed with suitable plugs upon suspension of the work for any reason.
- E. HDPE Pipe
 - 1. The requirements for laying of RCP pipe also apply to HDPE pipe with the following additional requirements.
 - 2. Installation of HDPE pipe shall be in accordance with either AASHTO Section 30 or ASTM D2321 and as recommended by the manufacturer.
 - 3. Because HDPE pipe will float in standing water, a dry trench shall be provided prior to laying the pipe. A qualified engineer shall be consulted to determine dewatering methods.
 - 4. Haunching large-diameter pipes (greater than 30 inches) shall be performed using maximum 8- inch lifts and compacted to 90 percent standard proctor density.
 - 5. Water tight joints shall be used. Pipe shall be watertight according to the ASTM D3212. Joint design shall be bell-and-spigot with an elastomeric rubber gasket meeting ASTM F477.
- F. PVC Pipe
 - 1. PVC PIPE JOINTS
 - i. All joints shall be made watertight.

- ii. Pipe shall be jointed in strict accordance with the pipe manufacturer's instruction. Jointing of all pipes shall be done entirely in the trench.
- 2. PVC Pipe
 - i. Lubricant for jointing of PVC pipe shall be applied as specified by the pipe manufacturer. Use only lubricant supplied by the supplied by the pipe manufacturer.
 - ii. PVC pipe shall be pushed home by hand or with use of a bar and block. The use of power equipment, such as a backhoe bucket, shall only be used at the direction of the manufacturer.
 - iii. The position of the gasket shall be checked to insure the joint has been properly made and is watertight. Care shall be taken not to exceed the manufacturer's recommended maximum deflection allowed for each joint.
 - iv. Field-cut pipe ends shall be cut square and the pipe surface beveled to the size and shape of a factory-finished beveled end. All sharp edges shall be rounded off.

3.5 INSTALLATION - CATCH BASINS AND DRAIN MANHOLES

- A. Contractor shall excavate to a depth of 12 inches below the bottom of and all around the proposed manhole or catch basin base, compact and fine grade and install washe screened gravel as a subbase material. Pipes shall extend no more than 3 inches inside the interior wall and all openings around pipe entrances and lift holes shall be thoroughly grouted with non-shrink grout prior to back filling. Compaction process shall be the same manner as compaction around pipe.
- A. The tops of frames and covers shall be set 1/8 inch below finish grade pavement in the street. Final grade locations for installations outside of the paved roadway shall be as shown on the drawings.
- B. All joints between the frame, grade rings, dome, barrels and base shall be set in place with nonshrink mortar. Inside the manhole, all joints where the sealing material is not flush with the inside wall shall be grouted with nonshrink mortar and finished by hand / wet-brushed.
- D. Grade adjustments shall be made using either precast grade rings/risers or clay/shale bricks.
- E. No backfilling of the structure in the excavation shall take place unless approved by the Town or Town's representative.

- F. When ground water is encountered in manholes, ³/₄-inch to 1-inch washed stone shall be placed around structure to a distance of at least half-way up the barrel of the highest pipe.
- G. When ground water is encountered in catch basins, ³/₄-inch to 1-inch washed stone shall be placed 2 feet all around structure to a distance of the high ground water elevation. The stone shall be placed against and over the end of the pipe opening to prevent entrance of the finer filling material. All catch basins that do not have a flat top slab designed for H-20 loading and cast iron frame cast in place shall be installed using blocks to make a square hole that will accept a frame and grate, and there shall be at least two full courses of brick for frame adjustment.

3.7 FIELD QUALITY CONTROL

- A. Request inspection prior to and immediately after placing aggregate cover over pipe.
- B. Compaction testing will be performed in accordance with Section 02200.
- C. If tests indicate Work does not meet specified requirements, remove work, replace and retest at no cost to the Owner.

3.8 **PROTECTION**

A. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

GUARD RAIL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions, Division 0 and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY OF WORK

- A. This section includes furnishing and installing guard rail and accessories per MassDOT standards as shown on the Contract Drawings and as specified herein.
- B. Related Sections Include the following:
 - 1. Division 1 General Requirements.
 - 2. Section 02576 Pavement Repair and Resurfacing.

1.3 SUBMITTALS

- A. Submit the following in accordance with Section 01300 Submittal Procedures
 - 1. Submit manufacturer's specifications, drawings, details, rails layout with appurtenances.
 - 2. Submit shop drawings, samples and certificates simultaneously as one complete package.

1.4 DELIVERY, STORAGE AND HANDLING

A. Provide in protected and secured area and covered until ready for installation.

PART 2 - PRODUCTS

2.1 GUARD RAIL AND CRASH RAIL

A. Provide rails as shown on the drawings and meeting MassDOT - Highway Standards.

PART 3 - EXECUTION

- 3.1 GENERAL
 - A. Notify Engineer, in writing, of improper conditions of work.

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- B. Do not proceed with work until unsatisfactory conditions have been corrected.
- C. Verify measurements at site.
- D. Check location of underground work to make sure the guardrail clears culvert headwalls and piles clear culvert footing.
- E. Do not drive equipment on areas to be landscaped, except as approved by Engineer. Areas not accessible from roads shall be protected with heavy wood planking. Remove barricades and protection at completion of project. Repair damaged landscape surfaces.

3.2 INSTALLATION

- A. Guardrail:
 - 1. Install in accordance with MassDOT Highway standard specifications and as shown on the drawings.

3.3 TOUCH-UP AND REPAIR WORK

A. Repair damaged guardrail and components as recommended by manufacturer.

3.4 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700 – Contract Closeout.

MISCELLANEOUS WORK AND CLEANUP

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions, Division 0 and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY OF WORK

- A. Furnish all labor, materials, equipment and incidentals required to do the miscellaneous work not specified in other sections but obviously necessary for the proper completion of the work as shown on the Drawings.
- B. When applicable the Contractor shall perform the work in accordance with other sections of this Specification. When no applicable specification exists the Contractor shall perform the work in accordance with the best modern practice and/or as directed by the Engineer.
- C. Related Sections include the following:
 - 1. Division 0 Bidding and Contract Requirements
 - 2. Division 1 General Requirements
- D. Work included:
 - 1. The Contractor shall be responsible for the following:
 - i. Installing and maintaining construction warning signs.
 - ii. Buried Utility Warning and Identification Tap
 - iii. Crossing and relocating existing utilities.
 - iv. Restoring of driveways and sidewalks.
 - v. Cleaning up.
 - vi. Incidental work.
 - vii. Job photographs, if required.
 - viii. Protection and/or removal and reinstallation of existing signs, lampposts, fence posts, fencing and mailboxes.
 - ix. Protection, bracing, and relocation of utility poles.
 - x. Restoration and replacement of curbing.
 - xi. Raking and re-seeding of grassed areas disturbed during construction and/or dewatering activities, including silt basin/dewatering activity areas. Loam and seed placed on the utility trench area will be paid under restoration of growth item in bid proposal.
- 2.1 Restoring discharge channel stone training walls.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Materials required for this Section shall be the same quality of materials that are to be restored. Where possible, the Contractor may re-use existing materials that are removed.

PART 3 – EXECUTION

3.1 INSTALLING AND MAINTAINING CONSTRUCTION WARNING SIGNS

- A. Construction work zone traffic control shall be the contractor's responsibility. Generally, conformance with Part VI of the Manual of Uniform Traffic Control Devices (MUTCD), latest edition, "Standards and Guides for Traffic Controls for Street and Highway Construction, Maintenance, Utility, and Incident Management Operations", will be considered to meet this requirement.
- B. Construction warning signs shall be in accordance with Section 01620 Identification Systems (Project Signs) and Section 01850 Traffic Management.

3.2 BURIED UTILITY WARNING AND IDENTIFICATION TAPE

A. Provide detectable aluminum foil plastic backed tape or detectable magnetic plastic tape manufactured specifically for warning and identification of buried piping. Tape shall be detectable by an electronic detection instrument. Provide tape in rolls, 3 inches minimum width, color coded for the utility involved with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be CAUTION BURIED [WATER, SEWER, ELECTRIC, GAS, ETC.] PIPING BELOW or similar. Use permanent code and letter coloring unaffected by moisture and other substances contained in trench backfill material. Bury tape with the printed side up at a depth of 12 inches below the top surface of earth or the top surface of the subgrade under pavements.

3.3 CROSSING AND RELOCATING EXISTING UTILITIES

- A. This Item includes any extra work required in crossing culverts, water courses, including brooks and drainage ditches, storm drains, gas mains, water mains, electric, telephone, gas and water services and other utilities. This work shall include but is not limited to the following: bracing, hand excavation and backfill (except screened gravel) and any other work required for crossing the utility or obstruction not included for payment in other items of this specification. Notification of Utility Companies shall be required prior to work being done.
- B. In locations where existing utilities cannot be crossed without interfering with the construction of the work as shown on the Drawings, the Contractor shall remove and relocate the utility as directed by the Engineer or cooperate with the Utility Companies concerned if they relocate their own utility.

- C. The Contractor shall coordinate with Utility Companies to complete the relocation of utility poles and their appurtenances in accordance with the Drawings.
- D. At pipe crossings and where designated by the Engineer, the Contractor shall furnish and place screened gravel bedding so that the existing utility or pipe is firmly supported for its entire exposed length. The bedding shall extend to the mid-diameter of the pipe crossed. Payment for screened gravel at pipe crossings will be made according to the unit price bid established in the Bid Form.

3.4 RESTORING OF DRIVEWAYS AND SIDEWALKS

- A. Existing public and private driveways disturbed by the construction shall be replaced. Paved drives shall be repayed to the limits and thickness existing prior to construction. Gravel drives shall be replaced and regraded.
- B. Existing public and private sidewalks disturbed by the construction shall be replaced with sidewalks of equal quality and dimension. In general, sidewalks shall be $2^{-1/2}$ inches thick after rolling and compacting and the material shall be top course bituminous asphalt.

3.5 CLEANING UP

A. The Contractor shall remove all construction material, excess excavation, buildings, equipment and other debris remaining on the job as a result of construction operations and shall restore the site of the work to a neat and orderly condition. Any materials, and sand or concrete materials shall be cleaned out of the manholes and catch basins. Haybales and siltfence as well as any silt and debris retained by same shall be removed.

3.6 INCIDENTAL WORK

A. Do all incidental work not otherwise specified, but obviously necessary to the proper completion of the Contract as specified and as shown on the Drawings.

3.7 PHOTOGRAPHS OF PROJECT

A. Prior to work, the Contractor may document existing conditions using construction photographs. Photographs for this purpose shall be at the Contractors' expense.

3.8 RESTORATION AND REPLACEMENT OF SIGNS, LAMPPOSTS, FENCE POSTS, FENCING AND MAILBOXES

A. Existing signs, lamp posts, fence posts, fencing and mailboxes which may be damaged by the Contractor or removed by the Contractor during the course of construction shall be reinstalled in a vertical position at the same location from which they were removed. Damaged items shall be replaced with an item equal to or better than the damaged items. A concrete anchor shall be provided as necessary, at no additional cost, to ensure a rigid alignment. Care shall be exercised in the reinstallation of all items to prevent damage to the new construction.

3.9 PROTECTION, BRACING, AND RELOCATION OF UTILITY POLES MISCELLANEOUS WORK AND CLEANUP

A. The Contractor shall be responsible for making all arrangements with the proper utility companies for the bracing, protection, and relocation of all utility poles that may be damaged or endangered by the Contractors operations, or to be relocated as directed on the Contract Drawings. Work under this item shall include the related removal and reinstallation of guy wires, or support poles whether shown on the Drawings or not.

3.10 RAKING AND RE-SEEDING

- A. Grass and landscaped areas disturbed by the Contractor shall be raked and replenished with loam if required. Place topsoil to a minimum depth of 4 inches for areas disturbed by Contractor's construction operations. Spread evenly and grade to elevations and slopes shown. Hand rake areas inaccessible to machine grading. Use all available onsite stockpiled topsoil and supplement with off-site topsoil as required.
- B. Areas shall be re-seeded as directed by the Engineer. Seed mixture shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop and in no case shall the weed seed content exceed 0.25% by weight. The seed shall be furnished and delivered in new, clean, sealed and properly labeled containers. All seed shall comply with State and Federal seed laws. Submit manufacturer's Certificate of Compliance. Seed that has become wet, moldy or otherwise damaged shall not be accepted.

3.11 RESTORING DISCHARGE CHANNEL STONE TRAINING WALLS

- A. The discharge channel stone training walls shall be demolished and stockpiled as needed to install the concrete box culvert, headwall, and the segmental gravity retaining wall. Disturbed areas of the discharge channel stone walls shall be rebuilt within the limits of work to provide a straight alignment.
- B. Tie in segmental gravity retaining walls and stone training walls with filter fabric and grout the void space as needed and per segmental gravity retaining wall manufacturer recommendations. The Contractor shall submit a plan showing the tie in locations of the segmental gravity retaining wall with the stone training wall.

3.12 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700 – Contract Closeout.

TOPSOIL

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section consists of manufacturing, delivering, and placing 6" of topsoil on prepared subgrade areas disturbed by construction. Topsoil, as available, may be stripped, screened, stockpiled and tested for reuse. Topsoil requirements in excess of available on-site will be imported. Both sources will be placed in compliance with this Section.

1.2 SUBMITTALS

- A. In accordance with Section 01300 SUBMITTALS. Submit soil analysis report for imported topsoil from the State University Agricultural Extension Service or other approved soil testing laboratory. Report shall cover soil textural classification (percentages of sand, silt, and clay) and include additive recommendations for lawn areas. Field methods of analysis are acceptable, but laboratory report is preferred.
- B. A ten (10) pound sample shall be submitted for review and acceptance.

1.3 PRODUCT HANDLING

A. Do not deliver topsoil in frozen, wet, or muddy condition.

PART 2 - MATERIALS

- 2.1 IMPORTED TOPSOIL (FOR GENERAL GRASS SEEDING)
 - A. Friable loam, typical of fertile local topsoil; free-from pure clay, weeds, noxious weed seeds, sod, clods and stones larger than 1 inch, toxic substances, litter, or other deleterious material; having a pH between 5.5 and 7.0. Soluble salts shall not exceed 4 milli-mhos per centimeter.
 - B. Loam borrow shall conform to MassDOT Standard Spec. M1.05.0 or shall be the product of a commercial sand and gravel processing facility. It shall be uncontaminated by saltwater, foreign matter, or substances harmful to plant growth. The acidity range of the Loam Borrow shall be pH 5.5 to 7.0.
 - C. Soil Texture: 20 to 40% fines (silt and clay fraction passing the 200 sieve) and 60 to 80% Sand and gravel. The maximum particle size shall be 1-inch.
 - D. Organic Content: 5 to 10%
 - E. Additives: As required by soil analysis of Topsoil for lawn areas.

2.2 WETLAND AND PLANTING TOPSOIL

- A. Planting soil imported to the project site shall be clean of all foreign debris and material such as, roots, rocks, glass, plastic, leaves, clay lumps and similar objects.
- B. The soil shall be clean processed base loom free from any chemical and oil contaminants and subject to review and acceptance by the engineer.
- C. Ten (10) pound sample shall be submitted for review and acceptance.
- D. Basic gradation shall be:

US Sieve Size No.	Percent Passing	
	Min	Max
10	100	-
18	85	100
35	70	95
60	50	85
140	36	53
270	32	42
0.002 mm	3	6

PART 3 - EXECUTION

3.1 PLACING TOPSOIL

A. Scarify compacted subgrade to a 2-inch depth to bond topsoil to subsoil. Place topsoil to a minimum depth of 6 inches for outside disturbed areas as shown on the Drawings. Spread evenly and grade to elevations and slopes shown. Hand rake areas inaccessible to machine grading. Use all available on-site stockpiled topsoil and supplement with off-site topsoil as required, including amendments.

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PART 1 - GENERAL

1.1 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to perform all lawn installation and fine grading work and related items as indicated on the Contract Documents and/or as specified in this Section and includes, but is not necessarily limited to, the following:
 - 1. Seeding
 - 2. Maintenance and protection

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of DIVISION 0 BIDDING AND CONTRACT REQUIREMENTS and other DIVISION 1 Specification Sections, apply to this section.
- B. Examine all Contract Documents and all other Sections of the Specifications for requirements therein affecting the work of this trade.
- C. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Section 02020 Erosion and Sediment Control
 - 2. Section 02920 Topsoil

1.3 SUBMITTALS

- A. At least 90 days prior to the first day of the seeding season described in this Section, submit to the Engineer proof of certification of Foreman or Crew Leader as Massachusetts Certified Landscape Professional or Massachusetts Certified Horticulturist in accordance with QUALITY ASSURANCE paragraph of this Section.
- B. Submit proof of landscape contractor's experience to the Engineer in accordance with QUALITY ASSURANCE paragraph of this Section.
- C. At least 30 days prior to intended use, the Contractor shall provide the following samples and submittals for approval. Do not order materials until Engineer's

approval of samples, certifications or test results has been obtained. Delivered materials shall closely match the approved samples. Acceptance shall not constitute final acceptance. The Engineer reserves the right to reject on or after delivery any material that does not meet these Specifications.

- Material Sampling and Testing of Loam Borrow from On-Site or Off-Site Sources shall be as specified in Section 2920 – TOPSOIL (Outside Disturbed Areas).
- 2. Fertilizer:
 - a. Submit product literature of seeding fertilizer and certificates showing composition and analysis.
 - b. Submit the purchasing receipt showing the total quantity purchased for the project prior to installation.
- 3. Seed: Submit a manufacturer's Certificate of Compliance to the Specifications with each shipment of each type of seed. These certificates shall include the guaranteed percentages of purity, weed content and germination of the seed, and also the net weight and date of shipment. No seed may be sown until the Contractor has submitted the certificates.
- 4. Hydroseeding: Prior to the start of hydroseeding, submit a certified statement for approval as to the number of pounds of materials to be used per 100 gallons of water.
- 5. Wood Cellulose Fiber Mulch: Submit 4 copies of manufacturer's literature and one material sample.
- 6. Limestone: Submit supplier's certification that the limestone being supplied conforms to these Specifications.
- 7. All additives needed to amend a specific soil in order to meet these specifications.
- D. Maintenance Instructions: At the time of Acceptance, the Contractor shall submit complete maintenance instructions for turf care for the Owner's use. The instructions shall be reviewed for approval by the Engineer as a pre-condition for Acceptance.

1.4 EXAMINATION OF CONDITIONS

A. All areas to be improved shall be inspected by the Contractor before starting work and any defects such as incorrect grading, or drainage problems shall be reported to the Engineer prior to beginning this work. The commencement of work by the Contractor shall indicate his acceptance of the areas to be improved, and he shall assume full responsibility for the work of this Section.
B. The Contractor shall be solely responsible for judging the full extent of work requirements involved.

1.5 QUALITY ASSURANCE

- A. Qualification of Landscape Contractor: The work shall be performed by a landscape contracting firm which has successfully installed work of a similar quality, schedule requirement, and construction detailing with a minimum of five years' experience. Proof of this experience shall be submitted per SUBMITTALS.
- B. Qualification of Foreman or Crew Leader: All work of seeding shall be supervised by a foreman or crew leader who is a certified landscape professional or a certified horticulturist.
 - 1. Landscape professional shall be a Massachusetts Certified Landscape Professional certified by the Associated Landscape Contractors of Massachusetts.
 - 2. Horticulturist shall be a Massachusetts Certified Horticulturist as certified by the Massachusetts Nursery and Landscape Association.
 - 3. Certification shall be current. Proof of certification shall be submitted per SUBMITTALS.
- C. The ratio of laborers to certified landscape professionals or certified horticulturist shall not exceed twelve to one. Certified Landscape Professional or Certified Horticulturist shall be on the project site throughout the day to day performance of the work described in this Section.

PART 2 - PRODUCTS

- 2.1 LOAM
 - A. As specified in Section 02920 Topsoil.

2.2 SOIL ADDITIVES

- A. As specified in Section 02920 Topsoil, except for additional applications of fertilizer that shall be specified under this Section based upon recommendations from soil analysis and testing as specified.
- 2.3 SEED
 - A. Seed mixture shall be fresh, clean, new crop seed. Grass shall be of the previous year's crop and in no case shall the weed seed content exceed 1% by weight. The

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seed shall be furnished and delivered in the proportion specified below in new, clean, sealed and properly labeled containers. All seed shall comply with State and Federal seed laws. Submit manufacturer's Certificates of Compliance. Seed that has become wet, moldy or otherwise damaged shall not be acceptable. Seed containing endophyte must be kept cool and dry at all times; do not stockpile in the sun.

- 1. Seed Mixture Composition for infiltration basin areas:
 - a. New England Erosion Control/Restoration Mix For Detention Basins and Moist Sites by New England Wetland Plants, Inc. or approved similar seed mix.
 - b. Seeding rate shall be 1 pound per 2,500 square feet.
- 2. Seed Mixture Composition for grass-filled permeable paver areas:
 - a. New England Erosion Control/Restoration Mix For Dry Sites and by New England Wetland Plants, Inc. or approved similar seed mix.
 - b. Seeding rate shall be 1 pound per 1,250 square feet.
- 3. Seed Mixture Composition for all other lawn areas:

Common Name	Proportion By Weight	Germination <u>Minimum</u>	Purity <u>Minimum</u>
Red Fescue	60%	85%	95%
Kentucky Bluegrass	20%	85%	95%
Red Top	20%	90%	95%

- a. All grass varieties shall be within the top 50 percent of varieties tested in National Turfgrass Evaluation Program, or currently recommended as low maintenance varieties by University of Massachusetts or the University of Rhode Island
- b. Seeding rate shall be 6 pounds per 1,000 square feet.
- B. Seed may be mixed by an approved method on the site or may be mixed by a dealer. If the seed is mixed on the site, each variety shall be delivered in the original containers that shall bear the dealer's guaranteed analysis. If seed is mixed by a dealer then the Contractor shall furnish the Engineer the dealer's guaranteed statement of the composition of the mixture.

2.4 EROSION CONTROL BLANKET

- A. Erosion control blanket shall be placed within 48 hours after finish grading or topsoiling of an area is completed. If seeding is specified, within 24 hours after seeding of an area is completed. The erosion control blanket shall be placed in a manner that will minimize disturbance of the underlying soil. All equipment and application processes shall be approved by the Engineer prior to use.
- B. Refer to Section 02020 for information on erosion control blanket installation.

2.5 FERTILIZERS

- A. Fertilizer shall be a commercial product complying with the State and United States fertilizer laws. Deliver to the site in the original unopened containers that shall bear the manufacturer's certificate of compliance covering analysis. Fertilizer shall contain not less than the percentages of weight of ingredients as recommended by the soil analysis specified in Section 02920 TOPSOIL.
- B. Fertilizers shall be slow-release low nitrogen types (<0.5%) and shall not be used within 25 feet of a resource area.

2.6 LIMESTONE

A. Ground limestone for adjustment of loam borrow pH shall contain not less than 85 percent of total carbonates and shall be ground to such fineness that 40 percent will pass through 100 mesh sieve and 95 percent will pass through a 20 mesh sieve. The Contractor shall be aware of loam borrow pH and the amount of lime needed to adjust pH to specification in accordance with testing lab recommendations.

2.7 WOOD CELLULOSE FIBER MULCH

- A. Mulch to cover hydroseeded areas with slopes less than 3 to 1 shall be fiber processed from whole wood chips and clean recycled newsprint in a 1:1 proportion manufactured specifically for standard hydraulic mulching equipment. Fiber shall not be produced from recycled material such as sawdust, paper, or cardboard.
- B. Moisture content shall not exceed 10 percent, plus or minus 3 percent as defined by the pulp and paper industry standards. Fiber shall have a water holding capacity of not less than 900 grams water per 100 grams fiber.
- C. The mulch shall be of such character that the fiber will be dispersed into a uniform slurry when mixed with water. It shall be nontoxic to plant life or animal life.
- D. The mulch shall contain a non-petroleum based organic tackifier and a green dye to allow for easy visual metering during application but shall be non-injurious to plant growth.

2.8 HERBICIDES, CHEMICALS AND INSECTICIDES

- A. Provide chemicals and insecticides as needed for fungus or pest control. All chemicals and insecticides shall be approved by the Massachusetts Department of Food and Agriculture for the intended uses and application rates.
- B. Provide post-emergent crab grass control throughout the maintenance period to ensure a germinated and mown lawn free of crab grass.

2.9 WATER

A. The Contractor may use water provided by the Town upon request and approval of the DPW, if available. The Contractor shall be responsible to furnish his own supply of water to the site at no additional cost to the Owner. If Town water is not available, the Contractor shall be responsible to furnish adequate supplies at his own cost. All work injured or damaged due to the lack of water or use of too much water, shall be the Contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation. The Contractor's use of Owner's water shall be at his own risk.

PART 3 - EXECUTION

- 3.1 FILLING AND COMPACTION
 - A. As specified in Section 02920 TOPSOIL.
- 3.2 FINE GRADING
 - A. As specified in Section 02220 EARTHWORK.

3.3 SEEDING

- A. Contractor shall obtain Engineer's written approval of fine grading and bed preparation before doing any seeding.
- B. Limit of proposed grading shall be limit of seeding unless otherwise indicated on the Contract Documents. All lawn areas disturbed outside the limit of seeding shall be prepared and seeded as specified herein at no additional cost.
- C. The season for seeding shall be from April 1 to May 31 and from August 15 to September 30. The actual planting of seed shall be done, however, only during periods within this season which are normal for such work as determined by weather conditions and by accepted practice in this locality. To prevent loss of soil via water and wind erosion and to prevent the flow of sediment, fertilizer, and pesticides onto roadways, sidewalks, and into catch basins, seed loam areas within

5 Days of spreading the loam.

- D. Seed only when the bed is in a friable condition, not muddy or hard.
- E. Seeding of Disturbed areas shall be by Hydroseeding Method specified as follows:
 - 1. Prior to the start of work, furnish a certified statement as to the number of pounds of materials to be used per 100 gallons of water. This statement shall also specify the number of square feet of hydroseeding that can be covered with the quantity of solution in the hydroseeder.
 - 2. Hydroseed with wood cellulose fiber mulch at a rate as designated above in Part 2 PRODUCTS.
 - 3. For the hydroseeding process, a mobile tank with a capacity of at least 500 gallons shall be filled with water and the mixture noted above in the specified proportions. The resulting slurry shall be thoroughly mixed by means of positive agitation in the tank. Apply the slurry by a centrifugal pump using the hose application techniques from the mobile tank. Only hose application shall be permitted. At no time shall the mobile tank or tank truck be allowed onto the prepared hydroseed beds. The hose shall be equipped with a nozzle of a proper design to ensure even distribution of the hydroseeding slurry over the area to be hydroseeded and shall be operated by a person thoroughly familiar with this type of seeding operation.
 - 4. Contractor shall obtain Engineer's written approval of fine grading and bed preparation before doing any hydroseeding.
 - 5. Limit of work shall be limit of hydroseeding unless otherwise indicated on the Contract Documents. All lawn areas disturbed outside the limit of hydroseeding shall be hydroseeded.
 - 6. Seed only when the bed is in a friable condition, not muddy or hard. Construction methods shall conform to hydraulic method requirements specified in the Standard Specification.
 - 7. Hydroseeding shall be a two-step process.
 - a. Step one shall consist of spreading 100 percent of the required seed uniformly over the prepared loam bed so that the seed comes into direct contact with the soil. To mark the progress of the hydroseeding operation the Contractor may add 10 percent of the wood cellulose fiber mulch to the slurry.
 - b. Step two shall consist of a separate application of wood cellulose fiber mulch immediately following the first step of hydroseeding noted above. Apply the wood cellulose fiber mulch at a rate of 2,000 pounds per acre.

3.4 TURF MAINTENANCE

- A. Maintenance shall begin immediately after any area is seeded or sodded and shall continue for a 60 day active growing period for seeded areas or until Final Acceptance, whichever is longer following the completion of all lawn construction work, and until final acceptance of the project. In the event that seeding operations are completed too late in autumn for adequate germination and growth of grass, then maintenance shall continue into the following spring for the minimum 60 Day period and including the One (1) Year Maintenance Period.
- B. Maintenance shall include re-seeding, two (2) mowings, watering, weeding, fertilizing a minimum of two times in addition to the fertilizer incorporated by harrowing into the spread loam, and resetting and straightening of protective barriers. Lawn work maintenance shall also include chemical treatments as required for fungus and/or pest control.
- C. During the maintenance period, any decline in the condition of turf areas shall require immediate action to identify potential problems and to undertake corrective measures.
- D. Watering shall be done in a manner that will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment.
 - 1. The Contractor shall provide all labor and arrange for all watering necessary to establish an acceptable lawn. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary to maintain moist soil to a depth of at least two (2) inches for seeded areas and four (4) inches for sodded areas. At no time shall a tank truck be allowed on the reseeded/re-sodded beds.
 - 2. Watering shall be done in a manner that will provide uniform coverage, prevent erosion due to application of excessive quantities over small areas, and prevent damage to the finished surface by the watering equipment. The Contractor shall furnish sufficient watering equipment to apply water to the required soil depths each 8-hour period.
- E. After the grass in seeded areas has germinated, reseed all areas and parts of areas that fail to show a uniform stand of grass. Reseed such areas and parts of areas repeatedly until all areas are covered with a satisfactory growth of grass with no less than 20 grass shoots per square inch and 2,880 grass shoots per square foot. Reseeding together with necessary grading, fertilizing, and trimming shall be done at the Contractor's expense.

- F. Mowing and Edging:
 - 1. The Contractor shall keep lawn areas mowed until Acceptance of the contract by cutting to a height of two (2) inches when growth reaches three (3) inches or as directed by the Engineer.
 - 2. At each mowing, all edges of walks, drives, plant beds and other border conditions shall be edge trimmed by hand or machine to produce straight and uniform edge conditions.
 - 3. Remove and discard from paved areas only clippings and debris generated by each mowing and edging operation legally off-site. Engineer, if practical and aesthetic, may allow sweeping (not blowing) clippings back into grass. Mowers shall be equipped with mulching blades. Do not remove from grass areas any clippings that have been generated by mowing operations. Do not mow grass when wet.
- G. Fertilizing for seeded lawns: The first application of fertilizer is as specified in Section 02920 – Topsoil. A second application of fertilizer shall be applied to seeded areas at the time of the first mowing and shall be performed as specified herein. This second application shall be applied at a rate that ensures that one-half pound of nitrogen is applied per 1,000 square feet. Phosphorus and potassium shall be applied proportionally in accordance with the recommendations of the soil tests and the quantities previously integrated into the soil during the first application. A third application of nitrogen fertilizer shall be applied to seeded areas approximately two months after the second application. This third application shall correspond to the following application rates dependent upon the month of application.
 - 1. May 1-15: Apply 1.0 pound of nitrogen per 1,000 square feet.
 - 2. June 15-30: Apply 1.0 pound of nitrogen per 1,000 square feet.
 - 3. August 15 through September 15: Apply 1.0 pound of nitrogen per 1,000 square feet.
 - 4. November 1-15: Apply 1.5 pounds of nitrogen per 1,000 square feet.

**Nitrogen fertilizer shall be composed of 50 percent slowly soluble or slow release nitrogen fertilizer.

3.5 APPLYING LIMESTONE

A. The Contractor shall return to the site at the beginning of the next seeding season as specified above and spread limestone across all lawn areas installed under this Contract. Limestone shall be spread at rates determined by the soil tests specified.

3.6 ACCEPTANCE

- A. Following the minimum required maintenance periods for lawn construction, the Contractor shall request the Engineer in writing for a formal inspection of the completed work. Request for inspection shall be received by the Engineer at least 10 Days before anticipated date of inspection.
- B. Acceptance Requirements:
 - 1. At the end of the maintenance period, seeded areas shall have a close stand of grass as defined above with no weeds present and no bare spots greater than 3 inches in diameter over greater than 5 percent of the overall seeded area. At least 90 percent of the grass established shall be permanent grass species. If seeded areas are deficient, the Contractor's responsibility for maintenance of all seeded areas shall be extended until deficiencies are corrected.
- C. Furnish full and complete written instructions for maintenance of the lawns to the Owner at the time of acceptance in conformance with Submittals requirements.
- D. Engineer's inspection shall determine whether maintenance shall continue in any part.
- 3.7 CLEAN UP
 - A. Absolutely no debris may be left on the site. Excavated material shall be removed as directed. Repair any damage to site or structures to restore them to their original condition, as directed by the Engineer, at no cost to the Owner.

END OF SECTION 02945

SECTION 02950

PLANTING

PART 1 - GENERAL

1.1 SUMMARY

- A. The work of this Section consists of providing all labor, equipment, materials, incidental work, and construction methods necessary to perform all planting work and related items as indicated on the Contract Documents and as specified in this Section and includes, but is not limited to, the following:
 - 1. Planting native trees and seed mixes listed in the planting schedule in the Drawings.
 - 2. Staking, guying, and anchoring trees.
 - 3. Planting maintenance.
 - 4. Warranty all plants for a period of two (2) year warranty period following the installation of all plantings and loam and seeding.
 - 5. Providing and placing native trees.
- B. The Contractor shall ensure that all plants and trees are purchased and ready for installation prior to September 30, 2025.
- C. The Contractor shall maximize the reuse of on-site excavated surficial soils (0-12") with the exception of soils where invasive common reed is located and specified for removal and off-site disposal.

1.2 RELATED DOCUMENTS

- A. The General Documents, as listed on the Table of Contents, and applicable parts of Division 1, GENERAL REQUIREMENTS, shall be included in and made a part of this Section.
- B. Examine all Contract Documents and all other Sections of the Specifications for requirements therein affecting the work of this trade.
- C. The following items of related work are specified and included in other Sections of the Specifications:
 - 1. Section 01110 Environmental Protection
 - 2. Section 02020 Erosion and Sediment Control
 - 3. Section 02200 Earthwork

- 4. Section 02920 Topsoil
- 5. Section 02945 Turf
- 6. Appendix C North Andover Order of Conditions.

1.3 REFERENCES

- A. The following standards shall apply to the work of this Section.
 - 1. Hortus III, 1976, L. H. Bailey Hortorium.
 - 2. Tree and Shrub Transplanting Manual, E.B. Himelick, 1991, International Society of Arboriculture.
 - 3. American National Standards Institute (ANSI):
 - Z60.1 American Standard for Nursery Stock, latest edition, published by American Nursery & Landscape Association, (ANLA).

1.4 SUBMITTALS

- A. At least 90 days prior to the first day of the planting season described in this Division 2 Section, PLANTING, submit to the Engineer proof of certification of Foreman or Crew Leader as Massachusetts Certified Landscape Professional or Massachusetts Certified Horticulturist in accordance with QUALITY ASSURANCE paragraph of this Section.
- B. Submit proof of landscape contractor's experience with similar coastal wetland restoration projects, at least five in the past three years, to the Engineer in accordance with QUALITY ASSURANCE paragraph of this Division 2 Section, PLANTING.
- C. At least 30 days prior to ordering materials, the Contractor shall submit to the Engineer representative samples, certifications, manufacturer's product data and certified test results for materials as specified below. No materials shall be ordered or delivered until the required submittals have been reviewed and approved by the Engineer. Delivered materials shall closely match the approved samples. Approval shall not constitute final acceptance. The Engineer reserves the right to reject, on or after delivery, any material which does not meet these Specifications.
- D. Material Sampling and Testing:
 - 1. Material Sampling and Testing of Wetland Soils from off-site sources shall be specified, performed, and paid for under the work of this Section. Testing of the off-site wetland soils shall occur in-place after the soils have been spread and represents a second testing of the off-site wetland soils. The first sampling and testing shall have occurred prior to delivery of the wetland soils as specified, performed and paid for under the work of this Section. Additional sampling and testing of delivered and stockpiled wetland soils or delivered and spread wetland soils to verify that it meets the test results submitted for approval under the this Section.

- 2. Material Sampling and Testing of Off-Site Loam: Off-site loam shall be sampled and tested as specified, performed and paid for under the Division 2 Section, TOPSOIL, of this Specification.
- 3. Planting Mulch: Submit manufacturer's certification of contents.
- 4. Antidesiccant: Submit manufacturer's product data.
- 5. Peat: Submit manufacturer's certification of contents.
- 6. Mycorrhizal Fungal Inoculant:
 - a. Submit manufacturer's product data certifying that inoculant being supplied conforms to these Specifications.
 - b. Submit the purchasing receipt showing the total quantity purchased for the Project prior to installation.
 - c. Submit empty packets of fungal spore inoculant to the Engineer for verification of use.
- 7. Tree Staking System: Submit manufacturer's product data of system.
- 8. Soil Additives: Submit manufacturer's product data for all soil additives needed to amend a specific soil in order to meet the requirements of this Division 2 Section, PLANTING.

1.5 EXAMINATION OF CONDITIONS

- A. All areas to be planted shall be inspected by the Contractor before starting work and any defects such as incorrect grading or inadequate drainage shall be reported to the Engineer prior to beginning this work.
- B. The Contractor shall be solely responsible for judging the full extent of work requirements involved, including but not limited to the potential need for storing and maintaining plants temporarily and/or re-handling plants prior to final installation.
- C. All plants are the full responsibility of the Contractor between the time of digging at the nursery and final acceptance.

1.6 QUALITY ASSURANCE

- A. Qualification of Landscape Contractor: The work of this Division 2 Section, PLANTING, shall be performed by a landscape contracting firm which has successfully installed work of a similar quality, schedule requirement, and construction detailing with a minimum of five years' experience with specific experience in coastal wetland restoration. Proof of this experience shall be submitted per SUBMITTALS paragraph of this Division 2 Section, PLANTING.
- B. Qualification of Foreman or Crew Leader: All work of unloading, stockpiling, storing, transporting on-site, planting, staking and guying, fertilizing, and maintenance of trees, shrubs, vines, groundcover, and perennials shall be supervised by a foreman or crew leader who is a certified landscape professional or a certified horticulturist.

- 1. Landscape professional shall be a Massachusetts Certified Landscape Professional certified by the Associated Landscape Contractors of Massachusetts.
- 2. Certification shall be current. Proof of certification shall be submitted per SUBMITTALS paragraph of this Division 2 Section, PLANTING.
- C. The ratio of laborers to certified landscape professionals or certified horticulturist shall not exceed twelve to one. Certified Landscape Professional or Certified Horticulturist shall be on the project site throughout the day to day performance of the work described in this Division 2 Section, PLANTING.

PART 2 - PRODUCTS

2.1 SOIL ADDITIVES

A. Soil additives shall be specified and provided for under Sections 02920 and 02945.

2.2 GRADES AND STANDARDS OF PLANTS

- A. The Contractor shall furnish all plants shown on the Contract Drawings, as specified, and in quantities listed on the PLANT SCHEDULE. No substitutions will be permitted, without written approval by the Engineer. All plants shall be nursery grown unless specifically authorized to be collected as noted on the PLANT SCHEDULE.
- B. All plants shall be typical of their species or variety and shall have a normal habit of growth and be legibly tagged with the proper name.
- C. Plants shall be in accordance with ASNS Standards of the American Nursery & Landscape Association except as noted in this Division 2 Section, PLANTING. Botanical plant names shall be in accordance with plant designations included in Hortus III.
- D. If, at any time during the performance of the Contract, any plant shows signs of graft incompatibility, as determined by the Engineer, then the tree or shrub and all other similarly grafted plants of the same Genus/Species/Variety shall be rejected and removed from the site. Visual symptoms of graft incompatibility as cause for rejection include:
 - 1. Development of over-growths by rootstock or scion resulting in the development of shoulders or inverted shoulders.
 - 2. Suckering of the rootstock combined with poor growth or dieback of scion.
 - 3. Any mechanical weakness between scion and rootstock.
 - 4. Any marked difference in bark pattern and structure between scion and rootstock.
- E. All shrubs shall meet the following standards:

- 1. All shrubs shall be healthy and vigorous plants which are very well shaped, heavily branched, densely foliated, and true to form for the variety.
- 2. Canes or Trunk(s) and Branches:
 - a. Well formed and sturdy.
 - b. Branching shall be uniformly distributed close to the ground.
 - c. Scars shall be free of rot and not exceed 1/4 the diameter of the wood beneath in greatest dimension unless completely healed (except pruning scars).
 - d. Pruning scars shall be clean cut and shall leave little or no protrusion from the trunk or branch.
 - e. Graft unions shall be completely healed.
 - f. No suckers or water sprouts.
 - g. Contain no dead wood.
 - h. Free of cracks, splits, or cambium peeling.
- 3. No shrub with pest or mechanical damage will be accepted.
- 4. Shrubs shall show no signs of frost or winter damage to the foliage. Foliage shall not be in a state of drought stress. Leaves or needles shall show no signs of wilt or desiccation due to weather stress at any season of the year.

2.4 ROOT SYSTEMS FOR ALL PLANTS

- A. Each plant shall have an extensive, symmetrically balanced fibrous root system. Any root ball which shows signs of asymmetry, girdling, injury, or damage to the root system shall be rejected.
- B. Curling or spiraling of the roots along the walls of rigid containers will not be accepted. Curling, spiraling or girdling roots within balled and burlapped material will not be accepted.
- C. All parts of the fibrous root system of all plants shall be moist and fresh with a white color when washed of soil. When the plant is removed from the container, the visible root mass shall be healthy with white root tips. The root systems of all plants shall be free of disease, insect pests, eggs, or larvae.
- D. All trees, and all shrubs which are not grown in containers must be moved with the root systems as solid units with balls of earth firmly wrapped with untreated 8 ounce natural, biodegradable fabric burlap, firmly laced with stout, natural biodegradable cord or twine. The base of the tree trunks shall be wrapped with a protective burlap layer, surrounded by a cardboard trunk protector, and loosely tied with twine.
- E. The diameter and depth of the balls of earth must encompass the fibrous and root feeding system necessary for the healthy recovery of the plant. Minimum root ball diameters and depths shall be in accordance with ASNS standards.
- F. No plants shall be loose in the container.
- G. Container grown plants which have roots growing out of the container will be rejected.

N. Lake Cochichewick Boat Launch	
North Andover, MA	

2.5 PLANTING SOIL MIX

- A. Planting soil mix shall be an approved wetland soils specified and provided for under this Section and that has been pH adjusted according to particular planting applications and improved through the addition of organic matter as directed below. Wetland soils shall conform to the following pH levels:
 - 1. Planting soil mix for general planting of non-acid loving plants shall have a true pH value of 6.0 to 6.5. Planting soil mix shall be amended by the Contractor at his own expense to the proper pH range by mixing with dolomitic limestone as specified under the Division 2 Section, TOPSOIL, of this Specification.
 - 2. The amount of either sulfur or limestone required to adjust the planting soil mix to the proper pH range shall be approved by the Engineer on the basis of soil tests as specified, under the Division 2 Section, TOPSOIL, of this Specification.

2.6 WATER

A. The Contractor shall be responsible to furnish his own supply of water to the site at no extra cost. If possible, the Owner shall furnish the Contractor upon request with an adequate source and supply of water at no charge. However, if the Owner's water supply is not available or not functioning, the Contractor shall be responsible to furnish adequate supplies at his own cost. All work injured or damaged due to the lack of water, or the use of too much water, shall be the Contractor's responsibility to correct. Water shall be free from impurities injurious to vegetation.

2.7 ANTIDESICCANTS

A. Antidesiccants shall be emulsions or other materials which will provide a protective film over plant surfaces permeable enough to permit transpiration and specifically manufactured for that purpose. Manufacturer of antidesiccant shall be subject to the Engineer's approval and shall be used only after approval by the Engineer. Antidesiccant shall be delivered in containers of the manufacturer and shall be mixed and applied according to the manufacturer's instructions.

PART 3 - EXECUTION

3.1 PLANTING

- A. Furnishing and planting of plant material shall include, but shall not be limited to, the digging of planting pits and plant beds, amendment of wetland soils or loam as required to produce planting soil mix, provision of soil additives required to adjust for pH requirements of specific plants, furnishing the plants as specified as well as the labor of planting, fertilizing, and maintenance.
- B. Prior to spreading of wetland soils, subgrades shall have been tested to determine if they are too compact to drain water as specified, performed and paid for under the work of this Section.

- C. The Contractor shall locate plant material sources and ensure that plants are shipped in timely fashion for installation.
- D. Contractor shall locate all existing underground utilities that are within 10 feet of the proposed planting pits and notify the Engineer of any conflicts prior to digging plant pits.
- E. Seasons for Planting:
 - 1. Spring: Deciduous materials March 21 through May 1; Evergreen materials April 15 through June 1.
 - Fall: Deciduous materials October 1 through December 1: Evergreen materials – August 15 through October 15.
 - 3. No planting or seeding shall be completed in frozen soils.
- F. Plant Material Inspection:
 - 1. At least one month prior to the expected planting date, the Landscape Contractor shall select and tag stock to be planted under this Division 2 Section, PLANTING.
 - 2. The Contractor shall be responsible to certify the availability of quality plants in specified sizes from his/her sources of supply.
 - 3. Unless specifically designated otherwise, a representative of the Engineer may elect to accompany the Contractor on all plant material selection field trips.
 - 4. Representative samples of trees, shrubs, and ground cover plants may be tagged or marked for approval as an "Approved Typical Sample" and shipped to the site. Any shrub or groundcover plant that arrives at the construction site that does not meet the Approved Typical Sample will be rejected by the Engineer.
 - 5. Plants to be inspected shall be in locations and conditions that allow direct and un-obscured inspection by the Engineer. Container grown or balled and burlapped shrubs shall be pulled from holding blocks by the nurseryman for scrutiny by the Engineer at no additional cost to the Owner. Harvested trees held in storage shall not have branches tied up. Harvested trees shall not have trunks obscured by burlap, cardboard trunk protection, or other devices that would otherwise obscure inspection. In the event that branches are tied up, trunks are obscured by burlap or cardboard trunk protection, or root flares hidden by burlap and twine and the Engineer cannot inspect root flares, trunks or branching habit, the Contractor shall bear all responsibility and costs associated with tree rejection at a later date during the course of the Contract.
 - 6. Inspection and approval of plants at the source shall not impair the right of subsequent inspection and rejection upon delivery to the site, or during the progress of the work if the Engineer finds that plants do not meet the requirements of the PLANT SCHEDULE or this Contract, have declined noticeably due to handling abuse, lack of maintenance, or other causes. Cost of replacements, as required, shall be borne by the Contractor.

- G. Placement of Wetland Soils for planting soil shall be specified under the work of this Section. Obtain Engineer's written approval of work of rough grading and finish grading prior to starting the work of planting.
- H. Planting:
 - 1. Notify the Engineer three (3) working days prior to the proposed arrival of plant material on the site. If not planted within 24 hours of delivery to the site, all plants shall be maintained in an on-site nursery. Container grown shrubs stored on site shall be shaded from direct sunlight at all times and shall not be stored directly on paved surfaces. All plants delivered to the site and not planted within 24 hours of delivery shall have their root balls covered with mulch and shall be watered on a daily basis such that root balls are kept moist throughout.
 - 2. Locations for all plants and outlines for planting areas shall be staked on the ground by the Contractor for approval by the Engineer before any plant pits or plant beds are dug. Notify the Engineer no less than 3 days prior to desired inspection date of staking to schedule site visit.
 - 3. Surficial salt marsh soils (to depth below high marsh root mass) shall be removed and staged immediately adjacent to the site for no more than five days. Soils shall be kept moist and replaced in-situ after installation of the sewer structures and/or pipe.
 - 4. Surficial soils (0-12" deep) from wetland resource areas (e.g. coastal beach, bordering vegetated wetland) other than those identified as salt marsh shall be removed and staged within the construction limits of work. Soils shall be replaced in-situ in areas of similar ecotype as from where they were removed. Surficial soils (0-12" deep) shall be removed from areas identified with invasive common reed vegetation and disposed of off-site. Care shall be taken to avoid dispersal of soils from invasive vegetation within limits of work.
 - 5. Circular plant pits shall not be required provided that the minimum dimension between the edge of the pit and the face of the rootball is not less than required by this Division 2 Section, PLANTING.
 - 6. All plant pits dug with a machine shall have the sides of the holes scraped with hand shovels to prevent glazing or compaction of the sides of the hole. Remove and stockpile excavated surficial soils (0-12" deep) for reuse as backfill for plant pit. All subsoil excavated from the bottoms of planting pits shall be removed from the site.
 - 7. Plant pits shall be dug to the dimensions shown on the Contract Documents.
 - a. Individual plant pits for shrubs shall be three times greater in diameter than the diameter of the root ball. Place root ball directly on subgrade. Slope sides of tree pits at a 45 degree angle.
 - b. Plant beds for shrub massing shall be one large and continuous excavated bed. Extend bed no less than 3 feet beyond limits of shrub root balls on perimeter of bed.

- c. Plant pits for trees and shrubs shall be dug to the depth of the rootball to be planted.
- d. Remove all soil from around the root flare of the stem of the plant and from the top of the rootball to determine the true depth of the rootball. All plants that have been planted and have root flares that are buried will be rejected.
- 8. All plant roots and earth balls must be damp and thoroughly protected from sun and wind from the beginning of the digging operation, during transportation, and at the site until the final planting.
- 9. Remove container plants from containers prior to planting.
- 10. Shrubs shall be placed in the center of plant pits, plumb, with the crown of their roots exposed and located above the surrounding finish grade.
- 11. Prior to completion of planting installations, remove rope and cut wire baskets from the top 1/3 of the root balls. Pull burlap away from the trunk or stem of the plant and cut burlap from the top 1/3 of the root balls.
- 12. Planting shall be backfilled with approved planting soil to the full depth of the planting pit or bed. Eliminate air pockets and compact the soil by flooding the tree pit or plant bed within 2 hours of planting installation. After water has drained from the planting pit or bed and planting backfill has dried enough additional planting soil shall be spread in pit or bed to bring the finished surface of the planting pit or bed to grades shown on the Contract Documents. A saucer shall be formed around each plant at a depth of 3 inches for trees and for shrubs.
- 13. Fertilizer shall be spread over the plant saucer or plant bed between the saucer and the edge of the rootball. Till the fertilizer into the soil to a depth of four inches prior to the placement of the planting mulch. Fertilizer shall be provided for under the Division 2 Section, TOPSOIL, of this Specification. Do not mulch until placement of the fertilizer has been verified by the Engineer. Fertilizer application rates shall be as determined by soil testing, analysis, and testing laboratory recommendations specified.
- I. All plants shall be watered immediately following planting as necessary to thoroughly moisten rootball and plant pit loam and thereafter shall be inspected frequently for watering needs and watered, as required, to provide adequate moisture in the planting pit. The Contractor shall inspect tree pits 24 hours after initial watering to confirm that they are draining properly. If surface water or excessively saturated plant pit soils exist, the Contractor shall immediately notify the Engineer. The Engineer will recommend remedial measures based upon site conditions.
- J. Mulch material shall be placed over entire saucer areas of individual trees and shrubs and over the entire area of planting beds to a depth of 3 inches after settlement, not later than one week after planting. Do not apply mulch prior to the first watering of plant materials. Do not apply mulch prior to placement of surface applied fertilizer and verification of placement by the Engineer.

- K. Pruning:
 - 1. As directed by the Engineer, each plant shall be pruned in accordance with the workmanship requirements of "Pruning Standards" for Class I, fine pruning, to preserve the natural character of the plant.
 - 2. Tree pruning, as required, shall be undertaken to the full height of affected trees.
 - 3. All dead wood or suckers and all broken or badly bruised branches shall be removed. Never cut a leader.
- L. Antidesiccant shall be applied to all evergreen and broadleaf evergreen plants in December and again in February, according to manufacturer's application recommendations and as directed by the Landscape Architect.
- M. Protect existing lawns from damage. Any damage resulting from planting operations shall be repaired immediately at no cost to the Owner. Repair work shall be as specified and installed under the work of Division 2 Section, TURF, of this Specification and paid for under the work of Division 2 Section, MISCELLANEOUS WORK AND CLEANUP.
- N. In the event that rock or underground construction work or obstructions are encountered in any plant pit or bed excavation work, alternate locations will be coordinated with the Engineer. Relocation of plant pits or beds shall be provided at no additional cost to the Owner. Provide the Engineer with no less than 48 hours notice of obstruction so that a site visit can be scheduled to establish new locations for plants.
- O. Absolutely no debris may be left on the site. Repair any damage to site as directed by the Engineer, at no additional cost.
- P. Seed mix shall be applied to clean bare soil. Seed can be applied by hydro-seeding, mechanical spreader or for small areas (less than 100 square feet) by hand. Lightly rake or roll to ensure proper seed to soil contact. Seeded areas shall be lightly mulched with weed free straw to conserve moisture.

3.2 MAINTENANCE

- A. Maintenance shall begin immediately after each plant is planted and shall continue for a minimum 30-day Monitoring Period and until the end of the fall planting season following Final Acceptance.
- B. Maintenance shall consist of keeping the plants in a healthy growing condition and shall include but is not limited to watering, weeding, cultivating, pruning, re-mulching, straightening of trees to a plumb position, removal of dead material, resetting plants to proper grades or upright position, and maintaining the planting saucer.
 - 1. Plants shall be inspected for watering needs at least twice each week and watered to promote plant growth and vitality. The following watering rates assume that the soil is free draining. If the on-site conditions do not ensure a free draining soil, then notify the Engineer in writing of this condition. Watering rates for trees, shrubs, ground cover, vines and perennials in free draining soils are presented here as guidelines to ensure that the top six inches of plant bed soil

remains moist at all times. Actual watering rates may vary depending upon soil conditions. Guideline rates shall be as follows:

Type of Plant/Size

Weekly Watering Rate

Shrubs

Up to 2 ft. height	10 gallons
2 - 4 ft. height	20 gallons
4 - 6 ft. height	30 gallons
6 - 8 ft. height	40 gallons

- a. Water shall be applied by 1 inch diameter hose with an attached metering gauge.
- 2. For trees in mulched beds, apply water to the ground surface directly under the canopy. Water shall be applied at a sufficiently slow rate to prevent run off from the soil surface but great enough to equal 0.2 inches of water per square foot of canopy area per hour for 5 hours per week.
- 3. Planting beds and individual plant pits shall be kept free of weeds, and mulch shall be replaced as required to maintain the specified layer of mulch. Beds and individual pits shall be neat in appearance and maintained to the designed layout.
- 4. Plants that die during the maintenance period shall be removed and replaced by the Contractor within one week of notification and replaced during that growing season, unless directed otherwise by the Engineer.
- 5. Work of pruning, fertilizing, spraying, and similar activities shall be undertaken only by Certified Arborists and licensed chemical applicators, as pertinent to the work being performed.
- C. During the maintenance period, any decline in the condition of plantings shall require the Contractor to take immediate action to identify potential problems and undertake corrective measures. If required, the Contractor shall engage professional arborists and/or horticulturalists to inspect plant materials and to identify problems and recommend corrective procedures. The Engineer shall be immediately advised of such actions. Inspection and recommendation reports shall be submitted to the Engineer.

3.3 ACCEPTANCE

- A. Upon completion of all planting work, the Contractor shall request in writing that the Engineer formally inspect the planting work.
- B. If plant materials and workmanship are acceptable, the Engineer will issue a written Certificate of Conditional Acceptance to the Contractor.
- C. Following the issuance of the Certificate of Conditional Acceptance to the Contractor, the Contractor shall maintain the plants for a minimum 30 day Monitoring Period. At the end of the Monitoring Period, the plant material will be inspected by the Engineer to

determine whether or not all planting work has been performed to the requirements of this Division 2 Section, PLANTING.

- D. Acceptance Standards at end of the Monitoring Period: If plant material is reviewed when it is in full leaf, leaves shall be plump with water with a shape indicative of the species and shall be free of insect, pest and disease damage. Twigs shall have living cambium for their full length. Twigs and branches shall have a full bud set for their full length, including terminal buds. Trunks and branches shall be free of frost cracks; sun scald; damage due to insects, pests, and disease; structural defects; and damage resulting from machinery or tools. Plant material inspected and reviewed when the plants are not in full leaf shall have twigs, branches and trunks meeting the above requirements. All plants regardless of the season of review shall have a minimum of 75 percent healthy, balanced branching structure with a healthy terminal leader(s) with viable terminal bud(s).
- E. If any number of plants do not meet these Acceptance Standards at the time of inspection, or if in the Engineer's opinion, workmanship is unacceptable, written notice will be given by the Engineer to the Contractor in the form of a punch list, which itemizes necessary planting replacements and/or other deficiencies to be remedied. The Contractor's responsibility for maintenance of all plants shall be extended until replacements are made or other deficiencies are corrected. All plants that do not meet these Acceptance Standards shall be removed from the project within seven days of receipt of the punch list. Replacements shall conform in all respects to the Specifications for new plants and shall be planted in the same manner.
- F. Following the correction of all Punch List deficiencies, the Contractor shall request in writing that the Engineer formally inspect the planting work. If plant materials and workmanship are acceptable, the Engineer will issue a written Certificate of Final Acceptance to the Contractor.

3.4 GUARANTEE

- A. The date of the Certificate of Final Acceptance shall establish the commencement of the required December 31, 2022 guarantee and establishment period for planting work.
- B. At the end of the guarantee and establishment period, a final inspection will be held to determine whether any plant material replacements are required. Each plant shall be plumb, shall have a character that is natural for its species as determined by the Engineer, and shall conform to the Acceptance Standards described in this Division 2 Section, PLANTING. Plants found to be unacceptable shall be removed promptly from the site and replaced according to this Division 2 Section, PLANTING. A final inspection will be made after the replacement plants have lived through one year.
- C. At the end of the one-year guarantee and establishment period, remove all tree stakes, guys, or anchors installed on trees during the course of the work of this contract.
- D. All replacements shall be plants of the same kind and size specified in the PLANT SCHEDULE. The cost shall be borne by the Contractor, except for possible replacements due to vandalism or neglect on the part of others.

END OF SECTION 02950

DIVISION 3

CONCRETE

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SECTION 03501

MSE BLOCK RETAINING WALLS (SEGMENTAL RETAINING WALLS)

PART 1 - GENERAL

1.1 SUMMARY

A. Description

Work shall consist of furnishing all materials, labor, equipment, and supervision to install segmental retaining wall (SRW) units in accordance with plans and specifications and to the lines, grades, and dimensions designated on the construction drawings or as directed by the Engineer. Work shall also include furnishing and installing appurtenant materials required for construction of the retaining wall as shown on the Construction Drawings and Details.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section, and:
 - 1. Section 02200 Earthwork
 - 2. Section 02273 Geotextile Fabric

1.3 SUBMITTALS

- A. Product Data: The General Contractor shall submit copies as required in Section 01300 of the retaining wall submittal package to the Engineer for review and approval. The submittal package shall include technical specifications and product data from the manufacturer for the following:
 - 1. Submit structural analysis data, supporting engineering calculations and complete drawings in conformance with this specification and signed and sealed by a MA licensed Structural Professional Engineer. Documents shall also include support base and foundation details based on field verified soil data.
 - 2. Design drawings, calculations and shop drawings: Contractor shall submit schedule for type, location, quantity, and details of components required for the project.
 - 3. Modular Block System brochure.
 - 4. Precast Modular Block concrete test results that indicate compliance of retaining wall units with requirements based on comprehensive testing of current products. This shall include test data for: 28-day compressive strength, air content, and slump or slump flow (as applicable). This shall also include test data verifying all other properties used as basis of structural design.

5. Samples for Verification: Sets for each color, finish, and pattern of unit required. Include 2 or more samples in each set showing the full range of variations expected. Color to be selected by the Owner.

1.4 REFERENCED STANDARDS

- A. Segmental Retaining Wall Units
 - 1. ASTM C 140 Sampling and Testing Concrete Masonry Units
 - 2. ASTM C 94 Standard Specification for Ready-Mixed Concrete
 - 3. ASTM C 136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - 4. ASTM C 143 Standard Test Method for Slump of Hydraulic-Cement Concrete.
 - 5. ASTM C 260 Standard Specification for Air-Entraining Admixtures for Concrete.
 - 6. ASTM C 494 Standard Specification for Chemical Admixtures for Concrete.
 - 7. ASTM C 666 Standard Test Method for Concrete Resistance to Rapid Freezing and Thawing.
 - 8. ASTM C 1776 Standard Specification for Wet-Cast Precast Modular Retaining Wall Units.
 - 9. ASTM D 6916 Standard Test Method for Determining Shear Strength Between Segmental Concrete Units (Modular Concrete Blocks).
- B. Soils
 - 1. ASTM D 1556 Moisture Density Relationship for Soils, Modified Method
 - 2. ASTM D 422 Standard Test Method for Particle-Size Analysis of Soils
 - 3. ASTM D 698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
 - 4. ASTM D 2487 Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
 - 5. ASTM D 4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
 - 6. ASTM D 4972 Standard Test Method for pH of Soils
- C. Engineering Design

- 1. "NCMA Design Manual for Segmental Retaining Walls," 3rd Edition, 2009
- 2. International Building Code, 2012 Edition
- D. Where specifications and reference documents conflict, the Engineer shall make the final determination of applicable document.

1.5 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide segmental retaining walls capable of withstanding the effects of loads due to soil pressures resulting from grades indicated.
 - 1. Include the effects of sloped backfill as indicated on Drawings.
 - 2. Include the effects of superimposed loads as indicated on Drawings.
 - 3. Design retaining walls according to NCMA's "Design Manual for Segmental Retaining Walls."

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed segmental retaining walls similar in material, design, and extent to that indicated for a Project that has resulted in construction with a record of successful in-service performance.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where the Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of systems that are similar to those indicated for this Project in material, design, and extent.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated without delaying the Work, as documented according to ASTM E 548.
- D. Preconstruction Testing Service: Engage a qualified independent testing agency to perform the following preconstruction testing:
 - 1. Test proposed retaining wall units for connection strength according to NCMA SRWU-1.
 - 2. Test proposed backfill materials for pullout behavior according to GRI GG5, Controlled Strain Rate Method for Short-Term Testing (Method A).
- 1.7 DELIVERY, STORAGE, AND HANDLING
 - A. Deliver materials to Project Site in an undamaged condition.

- B. The Retaining Wall Installation Contractor shall inspect the materials upon delivery to ensure that the proper type, grade, and color of materials have been delivered.
- C. Store and handle retaining wall units and related materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, UV exposure, or other causes. Damaged materials shall not be incorporated into the work.
- D. Precast modular blocks shall be stored in an area with positive drainage away from the blocks. The contractor shall take care to protect the blocks from mud and excessive chipping and breakage. Precast modular blocks shall not be stacked more than three (3) units high in the storage area.
- E. Drainage aggregate and backfill material shall not be piled over unstable slopes or areas of the project site with buried utilities. Drainage aggregate material shall not be staged where it may become mixed with or contaminated by poor draining fine-grained soils such as clay or silt.
- F. Store accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The following wall systems shall be used:

Retaining Wall Units:

- a. Licensees of Stone Strong Systems Local representative: MBO Precasters
- b. Licensees of ReCon Retaining Wall Systems Local representative: Shea Concrete Products
- c. Approved equal.

2.2 PRECAST MODULAR BLOCK RETAINING WALL DESIGN INFORMATION FOR SOLID TYPE BLOCKS

A. Concrete Units: High-strength, regular-weight concrete units, specifically designed for use in segmental retaining walls, complying with ASTM C 90 or ASTM C1776, except with net-area compressive strength of 3000 psi (20.7 MPa) for average of 3 units and 2500 psi (17.2 MPa) for individual unit, maximum water absorption of 8 percent, and variation in height limited to 1/16 inch.

- 1. Provide units with lugs, projections, or holes and pins that locate successive courses in relation to the course below and maintain that alignment as backfill is placed, and that interlock with units above and below.
- 2. Provide units with lugs, projections, holes and pins, or hollow cores for filling with drainage fill to interlock with units above and below.
- 3. Precast modular block retaining wall units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or performance of the structure. Chips smaller than 1.5" (38 mm) in its largest dimension and cracks not wider than 0.012" (0.3 mm) and not longer than 25% of the nominal height of the PMB unit shall be permitted. PMB units with bug holes in the exposed architectural face smaller than 0.75" (19 mm) in its largest dimension shall be permitted. Bug holes, water marks, and color variation on non-architectural faces are acceptable. PMB units that exhibit cracks that are continuous through any solid element of the PMB unit shall not be incorporated in the work regardless of the width or length of the crack.
- 4. All units for the project shall be obtained from the same manufacturer. The manufacturer shall be licensed and authorized to produce the retaining wall units by the precast modular block system patent holder/licensor.
- 5. Concrete used in the production of the precast modular block units shall be firstpurpose, fresh concrete. It shall not consist of returned, reconstituted, surplus or waste concrete. It shall be an original production mix meeting the requirements of ASTM C 94.
- B. Colors: The block color shall be selected by the Owner from the available range of colors available from the precast modular block manufacturer.
- C. Surface Texture: Provide units with machine-split faces and smooth, as-cast beds.
- D. Shapes: Each concrete block shall be cast in a single continuous pour without cold joints. Provide units of basic shapes and dimensions indicated.
- E. Special Units: Provide corner units, end units, cap units, and other special shapes as necessary to produce retaining walls of dimensions and profiles indicated and to provide indicated textures on exposed surfaces.
- F. Subsurface Conditions: Design system with a soil compressive strength of 2-tsf. Boring information is provided in the Appendix.

2.3 PRECAST MODULAR BLOCK RETAINING WALL DESIGN INFORMATION FOR STONE FILLED TYPE BLOCKS

A. Wall units shall conform to ASTM C1776.

- B. Dimension tolerances for precast modular blocks shall be +/- 1/8 inch for height, +/- 1/8 inch for length (along face), and +1/2 to -1/4 inch for width (face to tail).
- C. Concrete for precast modular blocks shall have a minimum 28-day compressive strength of 4,000 psi. Entrained air content shall be between 5 and 7%.
- D. Internal unit reinforcement or unreinforced units shall be provided according to published Stone Strong engineering guidance. Reinforced units shall be marked with the type of reinforcement.
- E. The face pattern shall be selected from the manufacturer's standard molds. The color of the units shall be natural gray. A concrete stain may be field applied to color the units if specified by the Engineer or Owner.
- F. Subsurface Conditions: Design system with a soil compressive strength of 2-tsf. Boring information is provided in the Appendix.

2.4 INSTALLATION MATERIALS

- A. Leveling Pad: The precast modular block units shall be placed on a leveling pad constructed from compacted sand, gravel, or combination thereof approved by the Engineer (USCS soil types GP, GW, SP and SW) and shall be a minimum of 6 inches in depth. The leveling pad shall extend laterally at least a distance of 6 inches from the toe and heel of the lowermost precast modular block retaining wall unit.
- B. Cap Adhesive: Product supplied or recommended by retaining wall unit manufacturer for adhering cap units to units below.
- C. Drainage Aggregate and Unit Core Fill: Drainage aggregate and unit core fill shall be a durable crushed stone conforming to No. 57 size per ASTM C33 with the following particle-size distribution requirements per ASTM D422:

U.S. Standard	
Sieve Size	<u>% Passing</u>
1-1⁄2" (38 mm)	100
1" (25 mm)	95-00
1⁄2" (13 mm)	25-60
No. 4 (4.76 mm)	0-10
No. 8 (2.38 mm)	0-5

- D. Backfill Soil:
 - 1. The backfill soil material shall be free of debris. Unless otherwise noted on the final, P.E.-sealed retaining wall plans prepared by the Wall Design Engineer, the backfill material shall consist of the inorganic USCS soil types GP, GW, SW, SP and SM, meeting the following gradation, as determined in accordance with ASTM D 422:

Sieve Size Percent Passing

1 inch 100

No. 4	20-100
No. 40	0-60
No. 200	0-35

- 2. The maximum particle size of poorly-graded gravels (GP, no fines) should not exceed 3/4 inch unless expressly approved by the Wall Design Engineer
- 3. The plasticity of the fine fraction shall be less than 20.
- 4. The pH of the backfill material shall be between 3 and 9 when tested in accordance with ASTM G 51.
- E. Drainage: Drainage weeps shall be installed within the proposed retaining wall to maintain gravity flow of water outside the retained-soil zone. The drainage weeps shall be installed at the locations shown on the final construction drawings.

2.4 SOURCE QUALITY CONTROL

- A. The Inspection Engineer shall perform the following duties:
 - 1. Inspect the construction of the precast modular block structure for conformance with construction shop drawings and the requirements of this specification.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to construction, examine the areas in which segmental retaining walls will be constructed and conditions under which walls will be installed, with Installer present, for compliance with requirements for excavation tolerances, worker safety, condition of subgrades, and other conditions affecting performance of retaining walls.
 - 1. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. The retaining wall installer will conduct soil testing to establish final soil design parameters. Final retaining wall design will be submitted for approval by the installer to the Owner for approval.

3.2 RETAINING WALL INSTALLATION

- A. General: All work shall be performed in accordance with OSHA safety standards, state and local building codes, and manufacturer's requirements. All work shall be inspected by the Inspection Engineer as directed by the Owner. Place units according to manufacturer's written instructions. Lay units in running bond, overlapping half units of course below.
 - 1. All precast gravity blocks shall be installed at the proper elevation and orientation as shown on the wall profiles and details on the construction plans or

as directed by the Engineer. The precast gravity block units shall be installed in general accordance with the manufacturer's recommendations. The specifications and drawings shall govern in any conflict between the two requirements.

- 2. Form corners and ends by using special units.
- 3. Form corners and ends by cutting units with motor-driven saw.
- 4. Form corners and ends by splitting with mason's hammer and chisel.
- 5. Form corners and ends by any method above as indicated in manufacturer's written instructions.
- B. Excavation: Contractor shall excavate to the lines and grades required for construction of the precast modular block retaining wall as shown on the project grading plans.
 - 1. Contractor shall take precautions to minimize over-excavation. Over-excavation shall be filled with compacted infill material, or as directed by the Engineer, at the Contractor's expense.
 - 2. Contractor shall verify location of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation.
 - 3. Excavation support, if required, is the responsibility of the Contractor.
- C. Leveling Pad Construction:
 - 1. Prior to construction of the precast modular block retaining wall, the leveling pad shall be constructed to provide a level, hard surface on which to place the first course of precast modular block units. The leveling pad area shall be cleared and grubbed. All topsoil, brush, frozen soil and organic material shall be removed. Additional foundation soils found to be unsatisfactory beyond the specified undercut limits shall be undercut and replaced with approved fill as directed by the Engineer. Any volume of soils undercut and replaced shall be noted by the Inspection Engineer.
 - 2. Following excavation for the leveling pad and undercut zone (if applicable), the Inspection Engineer shall evaluate the in-situ soil in the foundation and retained soil zones to ensure that it meets the shear strength and bearing capacity requirements indicated on the retaining wall construction shop drawings.
 - 3. Leveling pad shall be placed as shown on the final retaining wall plans with a minimum thickness of 6 inches or as required by the approved submittal. The leveling pad shall extend laterally at least a distance of 6 inches or as required by the approved submittal from the toe and heel of the lowermost precast modular block retaining wall unit.

- D. First Course: Place first course of retaining wall units on leveling base/course for full length of wall. The units shall be leveled side-to-side, front-to-rear and with adjacent units, and aligned to ensure intimate contact with the leveling pad. No gaps shall be left between the front of adjacent units. Alignment may be done by means of a stringline or offset from base line to the back of the units.
 - 1. Tamp units into leveling base as necessary to bring tops of units into a level plane.
 - 2. Place and compact fill, either drainage fill or soil fill as indicated, to top of first course. Place fill on both sides of wall at same time without disturbing alignment of units. Fill voids between and within units with clean drainage aggregate.
 - 3. Clean all excess debris from top of units prior to installing subsequent course.
- E. Subsequent Courses: Sweep excess fill from tops of course below. Place units in firm contact, properly aligned, and directly on course below.
 - 1. For units with lugs designed to fit into holes in units of adjacent course, lay units so lugs are accurately aligned with holes and bedding surfaces are firmly seated on beds of units below.
 - 2. For units with lips at front of units, slide units as far forward as possible for firm contact with lips of units below.
 - 3. For units with pins, carefully align holes in units above with holes below and insert pins according to manufacturer's written instructions.
 - 4. Place and compact fill as each course is laid. Place fills on both sides of wall at same time, where both sides are indicated to be filled.
 - 4. Fill voids between and within units with drainage aggregate.
 - 5. Layout and installation of curves and corners shall be in accordance with the plan details or in general accordance with precast retaining wall unit's manufacturer's installation guidelines.
 - 6. The wall face cant shall not differ more than + 2 degrees from that specified.
 - 7. Drainage aggregate, unit core fill, and properly compacted backfill shall be complete and in-place for each course of block units before the next course of blocks is stacked.
 - 8. Repeat procedures to extent of wall height.
- F. Cap Units: Place cap units and secure with cap adhesive according to manufacturer's written instructions.

3.3 DRAINAGE AGGREGATE AND BACKFILL PLACEMENT

- A. General: Comply with requirements of Division 2 Section 02200 "Earthwork" and retaining wall unit manufacturer's written instructions.
- B. Place, spread, and compact fill in uniform lifts not exceeding a compacted thickness of 8" for full width and length of embankment as wall is laid. Begin at back of wall and place and spread fill toward embankment.
 - 1. Use only hand-operated compaction equipment within 36 inches of wall.
 - 2. Compact drainage fill to not less than 95 percent maximum dry density according to ASTM D 1556.
 - 3. Compact soil backfill to not less than 95 percent maximum dry density according to ASTM D 1556.
 - 4. The General Contractor shall protect the precast modular block wall structure from any surface water runoff at all times through the use of berms, diversion ditches, silt fence, temporary drains and/or any other necessary measures to prevent soil staining of the wall face, scour of the retaining wall foundation or erosion of the drainage fill, soil backfill, or wall infill.
- C. Place filter fabric against back of wall and place a layer of drainage fill at least 12 inches deep behind the filter fabric to within 12 inches of finished grade. Place another layer of filter fabric between drainage fill and soil backfill.
 - 1. Place impervious fill over top edge of drainage fill layer.
- D. At completion of wall construction, backfill shall be placed level with the final top of wall elevation. If final grading, paving, landscaping and/or storm drainage installation adjacent to the wall is not placed immediately after wall completion, temporary grading and drainage shall be provided to ensure water runoff is not directed at the wall nor allowed to collect or pond behind the wall until final construction adjacent to the wall is completed.

3.4 CONSTRUCTION TOLERANCES

- A. Variation from Level: For bed-joint lines along walls, do not exceed 1/4 inch in 10 feet or 1 inch in 40 feet or more.
- B. Variation from Indicated Batter: For slope of face of wall, do not vary from indicated slope by more than 1/4 inch in 10 feet.
- C. Variation in Plan Position: For ends and faces of walls in relation to property lines, buildings, and other objects, do not vary from plan dimensions by more than 1 inch or from depicted plan relationship (scaled dimensions) by more than 3 inches.

D. Variation in Linear Wall Line: For walls indicated as straight, do not exceed 1/4 inch in 10 feet or 1 inch in 40 feet or more from a straight line.

3.5 FIELD QUALITY CONTROL

- A. Comply with requirements of Division 2 Section 02200 "Earthwork" for in-place soil density testing.
 - 1. In each compacted backfill layer, perform at least 1 in-place field density test for each 100 feet or less of retaining wall length, but no fewer than 2 tests along a wall face.
- B. Inspect and document soil compaction in accordance with these specifications:
 - 1. Required dry unit weight
 - 2. Actual unit dry weight
 - 3. Allowable moisture content
 - 4. Actual moisture content
 - 5. Test Location and Elevation
 - 6. Distance of test location behind the wall face

3.6 ADJUSTING AND CLEANING

- A. Remove and replace segmental retaining walls of the following description:
 - 1. Broken, chipped, stained, or otherwise damaged units. Units may be repaired if methods and results are approved by Engineer.
 - 2. Segmental retaining walls not matching approved samples and mockups.
 - 3. Segmental retaining walls not complying with other requirements indicated.
- B. Replace in a manner that results in segmental retaining wall's matching approved samples and mockups, complying with other requirements, and showing no evidence of replacement.

END OF SECTION 02832

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DIVISION 16

ELECTRICAL

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SECTION 16080

UNDERGROUND SYSTEMS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions, Division 0 and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY OF WORK

- A. The work covered under this Section includes all labor, materials, tools, equipment, and accessory items and performing all operations necessary to furnish and install the complete electrical work in accordance with this section of these specifications, the drawings and the standards of the applicable codes listed herein and including the items listed below.
 - 1. Conduit and Fittings
 - 2. Warning Tape
 - 3. Handholes
 - 4. Reset Guy Wire
 - 5. Protect and Support Utility Pole
 - 6. Coordinate with Electric Company
- B. Related Sections include the following:
 - 1. Division 0 Bidding and Contract Requirements
 - 2. Division 1 General Requirements
- C. Work not included:
 - 1. Excavation and backfilling, including gravel or sand bedding for underground electrical work is included under DIVISION 2 SITE WORK of these Specifications.

1.3 SUBMITTALS

A. Manufacturer's literature and brochures shall be submitted for all items to be furnished in accordance with the provisions of the SECTION 01300, SUBMITTALS.

- B. Submittals required under this section include, but are not limited to the following:
 - 1. Conduit and Fittings
 - 2. Warning Tape
 - 3. Handholes
- C. Submit all other data as specified herein.
- D. No material shall be ordered or shop work started until the Engineer's approval of shop drawings has been given.

1.4 QUALITY ASSURANCE

- A. Requirements of the Regulatory Agencies
 - 1. The final, complete installation shall comply with all state and local statutory requirements having jurisdiction. The Electrical Contractor shall arrange for all necessary permits, pay all fees and arrange for all required inspections by local authorities. In general, all work shall comply with the requirements of the National Electrical Code, all state codes and the codes and ordinances of the city or town in which the work is to be done.
- B. Materials and equipment used shall be Underwriters Laboratories, Inc. listed wherever standards have been established by that agency. Written approval by the Engineer and local inspecting authority is required wherever UL Listed approval is not available.
- C. Manufacturer of Principal Equipment
 - 1. All conduit shall be made by one manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be shipped, stored, handled and installed in such a manner as not to degrade quality, serviceability, or appearance.

PART 2 – PRODUCTS

2.1 CONDUIT AND FITTINGS

- A. PVC conduit for underground installations shall be rigid polyvinyl chloride Schedule 40 as manufactured by Carlon, Phillips Petroleum Co., Triangle Pipe & Tube Co., Inc., or equal.
- B. PVC fittings shall be as manufactured by Carlon, An Indian Head Co., O.Z. Manufacturing Co., or equal.

2.2 POLYETHYLENE WARNING TAPE

A. Warning tape shall be red polyethylene film, 6 inch minimum width, Type XB-720 by

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W.H. Brady Co., or equal.

2.3 HANDHOLES

- A. Non-Utility Hand holes shall be UL listed, made of Polymer Concrete with Polymer Concrete Cover and open bottom.
- B. The polymer concrete shall be molded of sand and aggregate, bound together with a polymer resin, and reinforced with steel or fiberglass or a combination of the two.
- C. Hand hole enclosure and covers shall meet or exceed the Tier 22 load requirements set forth in the American National Standards Institute's ANSI/SCTE 77 2010
- D. Hand hole enclosure and covers shall meet or exceed the Tier 22 load requirements set forth in the American National Standards Institute's ANSI/SCTE 77 2010
- E. Hand holes shall be a minimum 11"x18".
- F. Covers shall be securely bolted to enclosure with stainless steel bolts and be on type and be embedded with the a "ELECTRICAL" logo.
- G. Provide 12 inches of compacted crushed stone under all hand holes.

PART 3 – EXECUTION

3.1 CONDUIT AND FITTINGS

- A. No wire shall be pulled until the conduit system is complete in all details; in the case of concealed work, until all rough plastering or masonry has been completed; in the case of exposed work, until the conduit system has been completed in every detail.
- B. The ends of all conduits shall be tightly plugged to exclude dust and moisture while the buildings are under construction.
- C. When a conduit has to be cut in the field, it shall be cut square using a hand or power hacksaw cutter, or an approved pipe cutter using knives. The use of pipe cutter wheels will not be permitted. The cut ends of the field cut conduit shall be reamed to remove burrs and sharp edges. Where threads have to be cut on conduit, the threads shall have the same effective length and shall have the same thread dimensions and taper as specified for factory cut threads on conduits. Field cut threads shall be protected by a field applied cold galvanizing compound.
- D. PVC conduits shall be installed using a fusing cement process. Conduits shall be watertight.
- E. A ground wire shall be run in all runs of PVC conduit.

3.2 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700 – Contract Closeout

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B. Provide warranty and guarantee on all equipment furnished and work performed for a period of one (1) year from the date of substantial completion.

END OF SECTION 16080

Appendix A

Massachusetts State Wage Rates



Governor

KIM DRISCOLL Lt. Governor

THE COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT DEPARTMENT OF LABOR STANDARDS

Prevailing Wage Rates

As determined by the Director under the provisions of the Massachusetts General Laws, Chapter 149, Sections 26 to 27H

LAUREN JONES Secretary

MICHAEL FLANAGAN Director

Awarding Authority:	Town of North Andover					
Contract Number:	City/Town: NORTH ANDOVER					
Description of Work:	Work includes demolition of existing boat launch and construction of a new hand carry boat launch, Mechanically Stabilized Earth (MSE) wall, permeable paver parking area, and two infiltration basins.					
Job Location:	0 Great Pond Road, North Andover, MA 01845					

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

• The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, the awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.

• This annual update requirement is generally not applicable to 27F "rental of equipment" contracts. For such contracts, the prevailing wage rates issued by DLS shall remain in effect for the duration of the contract term. However, if the prevailing wage rate sheet issued does not contain wage rates for each year covered by the contract term, the Awarding Authority must request updated rate sheets from DLS and provide them to the contractor to ensure the correct rates are being paid throughout the duration of the contract. Additionally, if an Awarding Authority exercises an option to renew or extend the contract term, they must request updated rate sheet to the contractor.

• This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the "Wage Request Number" on all pages of this schedule.

• An Awarding Authority must request an updated wage schedule if it has not opened bids or selected a contractor within90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.

• The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or a sub-contractor.

• Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**

• Every contractor or subcontractor working on the construction project must submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee's name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. For a sample payroll reporting form go to http://www.mass.gov/dols/pw.

• Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.

• Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.

• Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction					· · · · · · · · · · · · · · · · · · ·	
(2 AXLE) DRIVER - EQUIPMENT	01/01/2025	\$39.95	\$15.57	\$20.17	\$0.00	\$75.69
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2025	\$40.95	\$15.57	\$20.17	\$0.00	\$76.69
	12/01/2025	\$40.95	\$15.57	\$21.78	\$0.00	\$78.30
	01/01/2026	\$40.95	\$16.17	\$21.78	\$0.00	\$78.90
	06/01/2026	\$41.95	\$16.17	\$21.78	\$0.00	\$79.90
	12/01/2026	\$41.95	\$16.17	\$23.52	\$0.00	\$81.64
	01/01/2027	\$41.95	\$16.77	\$23.52	\$0.00	\$82.24
(3 AXLE) DRIVER - EQUIPMENT	01/01/2025	\$40.02	\$15.57	\$20.17	\$0.00	\$75.76
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2025	\$41.02	\$15.57	\$20.17	\$0.00	\$76.76
	12/01/2025	\$41.02	\$15.57	\$21.78	\$0.00	\$78.37
	01/01/2026	\$41.02	\$16.17	\$21.78	\$0.00	\$78.97
	06/01/2026	\$42.02	\$16.17	\$21.78	\$0.00	\$79.97
	12/01/2026	\$42.02	\$16.17	\$23.52	\$0.00	\$81.71
	01/01/2027	\$42.02	\$16.77	\$23.52	\$0.00	\$82.31
(4 & 5 AXLE) DRIVER - EQUIPMENT	01/01/2025	\$40.14	\$15.57	\$20.17	\$0.00	\$75.88
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2025	\$41.14	\$15.57	\$20.17	\$0.00	\$76.88
	12/01/2025	\$41.14	\$15.57	\$21.78	\$0.00	\$78.49
	01/01/2026	\$41.14	\$16.17	\$21.78	\$0.00	\$79.09
	06/01/2026	\$42.14	\$16.17	\$21.78	\$0.00	\$80.09
	12/01/2026	\$42.14	\$16.17	\$23.52	\$0.00	\$81.83
	01/01/2027	\$42.14	\$16.77	\$23.52	\$0.00	\$82.43
ADS/SUBMERSIBLE PILOT	01/01/2024	\$117.16	\$10.08	\$24.29	\$0.00	\$151.53
PILE DRIVER LOCAL 56 (ZONE 1) For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR	12/01/2024	\$30.70	00.02	\$18.36	\$0.00	\$67.06
LABORERS - ZONE 2	06/01/2024	\$39.70	\$9.90	\$18.36	\$0.00	\$60.35
	12/01/2025	\$40.47	\$9.90	\$18.36	\$0.00	\$09.55
	06/01/2025	\$42.47 \$42.01	\$9.90	\$18.36	\$0.00	\$70.75
	12/01/2026	\$45.91 \$45.25	\$9.90	\$18.36	\$0.00	\$72.61
	06/01/2027	\$46.80	\$9.90	\$18.36	\$0.00	\$75.06
	12/01/2027	\$40.80 \$48.25	\$9.90	\$18.36	\$0.00	\$75.00
	06/01/2027	\$40.23 \$40.75	\$9.90	\$18.36	\$0.00	\$70.51
	12/01/2028	\$49.75 \$51.25	\$9.90	\$18.36	\$0.00	\$70.51
For apprentice rates see "Apprentice- LABORER"	12/01/2028	\$31.23	\$9.90	\$18.30	\$0.00	\$/9.51
AIR TRACK OPERATOR (HEAVY & HIGHWAY)	12/01/2024	\$39.70	\$9.90	\$18.46	\$0.00	\$68.06
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	06/01/2025	\$41.09	\$9.90	\$18.46	\$0.00	\$69.45
	12/01/2025	\$42.47	\$9.90	\$18.46	\$0.00	\$70.83
	06/01/2026	\$43.91	\$9.90	\$18.46	\$0.00	\$72.27
	12/01/2026	\$45.35	\$9.90	\$18.46	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT.	12/01/2024	\$42.80	\$14.50	\$11.05	\$0.00	\$68.35
HEAI & FROST INSULATORS LOCAL 6 (BOSTON)	06/01/2025	\$43.80	\$14.50	\$11.05	\$0.00	\$69.35
	12/01/2025	\$44.80	\$14.50	\$11.05	\$0.00	\$70.35

Issue Date: 04/18/2025

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASPHALT RAKER	12/01/2024	\$39.20	\$9.90	\$18.36	\$0.00	\$67.46
LABORERS - ZONE 2	06/01/2025	\$40.59	\$9.90	\$18.36	\$0.00	\$68.85
	12/01/2025	\$41.97	\$9.90	\$18.36	\$0.00	\$70.23
	06/01/2026	\$43.41	\$9.90	\$18.36	\$0.00	\$71.67
	12/01/2026	\$44.85	\$9.90	\$18.36	\$0.00	\$73.11
	06/01/2027	\$46.30	\$9.90	\$18.36	\$0.00	\$74.56
	12/01/2027	\$47.75	\$9.90	\$18.36	\$0.00	\$76.01
	06/01/2028	\$49.25	\$9.90	\$18.36	\$0.00	\$77.51
	12/01/2028	\$50.75	\$9.90	\$18.36	\$0.00	\$79.01
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY)	12/01/2024	\$39.20	\$9.90	\$18.46	\$0.00	\$67.56
EADORERS - ZONE 2 (IEAVI & HIGHWAI)	06/01/2025	\$40.59	\$9.90	\$18.46	\$0.00	\$68.95
	12/01/2025	\$41.97	\$9.90	\$18.46	\$0.00	\$70.33
	06/01/2026	\$43.41	\$9.90	\$18.46	\$0.00	\$71.77
	12/01/2026	\$44.85	\$9.90	\$18.46	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE OPERATING ENGINEERS LOCAL 4	12/01/2024	\$57.03	\$15.55	\$16.50	\$0.00	\$89.08
	06/01/2025	\$58.33	\$15.55	\$16.50	\$0.00	\$90.38
	12/01/2025	\$59.78	\$15.55	\$16.50	\$0.00	\$91.83
	06/01/2026	\$61.08	\$15.55	\$16.50	\$0.00	\$93.13
	12/01/2026	\$62.53	\$15.55	\$16.50	\$0.00	\$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATING ENGINEERS LOCAL 4	12/01/2024	\$57.03	\$15.55	\$16.50	\$0.00	\$89.08
	06/01/2025	\$58.33	\$15.55	\$16.50	\$0.00	\$90.38
	12/01/2025	\$59.78	\$15.55	\$16.50	\$0.00	\$91.83
	06/01/2026	\$61.08	\$15.55	\$16.50	\$0.00	\$93.13
	12/01/2026	\$62.53	\$15.55	\$16.50	\$0.00	\$94.58
Por apprentice rates see "Apprentice- OPEKAIING ENGINEERS"				* 10.24	<u> </u>	
LABORERS - ZONE 2	12/01/2024	\$39.20	\$9.90	\$18.36	\$0.00	\$67.46
	06/01/2025	\$40.59	\$9.90	\$18.36	\$0.00	\$68.85
	12/01/2025	\$41.97	\$9.90	\$18.36	\$0.00	\$70.23
	06/01/2026	\$43.41	\$9.90	\$18.36	\$0.00	\$71.67
	12/01/2026	\$44.85	\$9.90	\$18.36	\$0.00	\$73.11
	06/01/2027	\$46.30	\$9.90	\$18.36	\$0.00	\$74.56
	12/01/2027	\$47.75	\$9.90	\$18.36	\$0.00	\$76.01
	06/01/2028	\$49.25	\$9.90	\$18.36	\$0.00	\$77.51
	12/01/2028	\$50.75	\$9.90	\$18.36	\$0.00	\$79.01

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BLOCK PAVER, RAMMER / CURB SETTER	12/01/2024	\$39.70	\$9.90	\$18.36	\$0.00	\$67.96
LABORERS - ZONE 2	06/01/2025	\$41.09	\$9.90	\$18.36	\$0.00	\$69.35
	12/01/2025	\$42.47	\$9.90	\$18.36	\$0.00	\$70.73
	06/01/2026	\$43.91	\$9.90	\$18.36	\$0.00	\$72.17
	12/01/2026	\$45.35	\$9.90	\$18.36	\$0.00	\$73.61
	06/01/2027	\$46.80	\$9.90	\$18.36	\$0.00	\$75.06
	12/01/2027	\$48.25	\$9.90	\$18.36	\$0.00	\$76.51
	06/01/2028	\$49.75	\$9.90	\$18.36	\$0.00	\$78.01
For apprentice rates see "Apprentice- LABORER"	12/01/2028	\$51.25	\$9.90	\$18.36	\$0.00	\$79.51
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY &	12/01/2024	\$39.70	\$9.90	\$18.46	\$0.00	\$68.06
HIGHWAY) LABORERS - ZONE 2 (HEAVY & HIGHWAY)	06/01/2025	\$41.09	\$9.90	\$18.46	\$0.00	\$69.45
	12/01/2025	\$42.47	\$9.90	\$18.46	\$0.00	\$70.83
	06/01/2026	\$43.91	\$9.90	\$18.46	\$0.00	\$72.27
	12/01/2026	\$45.35	\$9.90	\$18.46	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
BOILER MAKER BOILERMAKERS LOCAL 29	01/01/2024	\$48.12	\$7.07	\$20.60	\$0.00	\$75.79

A	Apprer	ntice - BOILERMAKER - Local 2	29					
1	E ffecti Step	ve Date - 01/01/2024 percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rat	e
-	1	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.5	7
	2	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.5	7
	3	70	\$33.68	\$7.07	\$14.23	\$0.00	\$54.9	8
	4	75	\$36.09	\$7.07	\$15.24	\$0.00	\$58.4	0
	5	80	\$38.50	\$7.07	\$16.25	\$0.00	\$61.8	2
	6	85	\$40.90	\$7.07	\$17.28	\$0.00	\$65.2	5
	7	90	\$43.31	\$7.07	\$18.28	\$0.00	\$68.6	6
	8	95	\$45.71	\$7.07	\$19.32	\$0.00	\$72.1	0
1	Notes:						 	
1	Apprei	ntice to Journeyworker Ratio:1:4						
BRICK/STONE/	ARTIF	ICIAL MASONRY (INCL. MASO	ONRY 02/01/202:	5 \$65.80	\$11.49	\$23.59	\$0.00	\$100.88
WATERPROOFII	NG) 11.3 (1.9)	VN)	08/01/2023	5 \$67.95	\$11.49	\$23.59	\$0.00	\$103.03
		··· ·	02/01/2020	5 \$69.30	\$11.49	\$23.59	\$0.00	\$104.38
			08/01/2020	5 \$71.50	\$11.49	\$23.59	\$0.00	\$106.58

02/01/2027

\$72.90 \$11.49 \$23.59

\$0.00

\$107.98

	Effecti	ve Date -	02/01/2025				Supplemental		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1	50		\$32.90	\$11.49	\$23.59	\$0.00	\$67.98	
	2	60		\$39.48	\$11.49	\$23.59	\$0.00	\$74.56	
	3	70		\$46.06	\$11.49	\$23.59	\$0.00	\$81.14	
	4	80		\$52.64	\$11.49	\$23.59	\$0.00	\$87.72	
	5	90		\$59.22	\$11.49	\$23.59	\$0.00	\$94.30	
	Effecti	ve Date -	08/01/2025				Supplemental		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1	50		\$33.98	\$11.49	\$23.59	\$0.00	\$69.06	
	2	60		\$40.77	\$11.49	\$23.59	\$0.00	\$75.85	
	3	70		\$47.57	\$11.49	\$23.59	\$0.00	\$82.65	
	4	80		\$54.36	\$11.49	\$23.59	\$0.00	\$89.44	
	5	90		\$61.16	\$11.49	\$23.59	\$0.00	\$96.24	
	Notes:								
	Ì								
	Appre	ntice to Jou	ırneyworker Ratio:1:5						
BULLDOZER/GRADER/SCRAPER		12/01/2024	\$56.40	\$15.55	\$16.50	\$0.00	\$88.45		
OPERATING ENGI	VEEKS LC	JCAL 4		06/01/2025	\$ \$57.68	8 \$15.55	\$16.50	\$0.00	\$89.73
				12/01/2025	\$ \$59.12	2 \$15.55	\$16.50	\$0.00	\$91.17
				06/01/2020	5 \$60.40	\$15.55	\$16.50	\$0.00	\$92.45
				12/01/2020	5 \$61.84	4 \$15.55	\$16.50	\$0.00	\$93.89
For apprentice	rates see "	Apprentice- O	OPERATING ENGINEERS"						
LABORERS - FOUN	NDERP.	INNING B AND MARINE	E E E E E E E E E E E E E E E E E E E	12/01/2024	\$47.3	5 \$9.90	\$19.05	\$0.00	\$76.30
				06/01/2025	5 \$48.8	5 \$9.90	\$19.05	\$0.00	\$77.80
				12/01/2023	\$ \$50.3	5 \$9.90	\$19.05	\$0.00	\$79.30
				06/01/2020	5 \$51.90) \$9.90	\$19.05	\$0.00	\$80.85
For apprentice	rates see "	Apprentice- L	ABORER"	12/01/2020	\$53.40) \$9.90	\$19.05	\$0.00	\$82.35
CAISSON & UN	NDERP	INNING L	ABORER	12/01/2024	\$46.20) \$9.90	\$19.05	\$0.00	\$75.15
LABORERS - FOUN	IDATION .	AND MARINE	2	06/01/2023	\$47.70	9.90	\$19.05	\$0.00	\$76.65
				12/01/2025	\$49.20	9.90	\$19.05	\$0.00	\$78.15
				06/01/2020	\$50.7	5 \$9.90	\$19.05	\$0.00	\$79.70
				12/01/2020	\$52.2	5 \$9.90	\$19.05	\$0.00	\$81.20
	rates see "	Apprentice- L	ABORER"				¢10.0-		*== · *
LABORERS - FOUN	DEKP.	AND MARINE	OF MAN	12/01/2024	\$46.5	3 \$9.90	\$19.05	\$0.00	\$75.48
				06/01/2025	\$48.0	3 \$9.90	\$19.05	\$0.00	\$76.98
				12/01/2025	\$49.5	3 \$9.90	\$19.05	\$0.00	\$78.48
				06/01/2026	\$51.08	s \$9.90	\$19.05	\$0.00	\$80.03
For apprentice	rates see "	Apprentice- L	ABORER"	12/01/2020	\$52.58	8 \$9.90	\$19.05	20.00	\$81.53

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Lynn
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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR	12/01/2024	\$39.20	\$9.90	\$18.36	\$0.00	\$67.46
LABORERS - ZONE 2	06/01/2025	\$40.59	\$9.90	\$18.36	\$0.00	\$68.85
	12/01/2025	\$41.97	\$9.90	\$18.36	\$0.00	\$70.23
	06/01/2026	\$43.41	\$9.90	\$18.36	\$0.00	\$71.67
	12/01/2026	\$44.85	\$9.90	\$18.36	\$0.00	\$73.11
	06/01/2027	\$46.30	\$9.90	\$18.36	\$0.00	\$74.56
	12/01/2027	\$47.75	\$9.90	\$18.36	\$0.00	\$76.01
	06/01/2028	\$49.25	\$9.90	\$18.36	\$0.00	\$77.51
For apprentice rates see "Apprentice- LABORER"	12/01/2028	\$50.75	\$9.90	\$18.36	\$0.00	\$79.01
CARPENTER	03/01/2025	\$49.62	\$9.83	\$19.97	\$0.00	\$79.42
CARPENTERS -ZONE 2 (Eastern Massachusetts)	09/01/2025	\$50.87	\$9.83	\$19.97	\$0.00	\$80.67
	03/01/2026	\$52.12	\$9.83	\$19.97	\$0.00	\$81.92
	09/01/2026	\$53.37	\$9.83	\$19.97	\$0.00	\$83.17
	03/01/2027	\$54.62	\$9.83	\$19.97	\$0.00	\$84.42

Apprentice - CARPENTER - Zone 2 Eastern MA

Effective Date - 09/01/2025

Effecti	ive Date -	03/01/2025	Ammontion Dass Wass	Haalth	Dension	Supplemental	Total Data	
Step	percent		Apprentice base wage	пеани	relision	Unemployment	Iotal Kate	
1	45		\$22.33	\$9.83	\$1.73	\$0.00	\$33.89	
2	45		\$22.33	\$9.83	\$1.73	\$0.00	\$33.89	
3	55		\$27.29	\$9.83	\$3.40	\$0.00	\$40.52	
4	55		\$27.29	\$9.83	\$3.40	\$0.00	\$40.52	
5	70		\$34.73	\$9.83	\$16.51	\$0.00	\$61.07	
6	70		\$34.73	\$9.83	\$16.51	\$0.00	\$61.07	
7	80		\$39.70	\$9.83	\$18.24	\$0.00	\$67.77	
8	80		\$39.70	\$9.83	\$18.24	\$0.00	\$67.77	

	Effect	ive Date - 09/01/2025				Supplementa	i			
	Step	percent	Apprentice Base Wage	Health	Pension	tion Unemployment		Total Rate		
	1	45	\$22.89	\$9.83	\$1.73	\$0.00)	\$34.45		
	2	45	\$22.89	\$9.83	\$1.73	\$0.00)	\$34.45		
	3	55	\$27.98	\$9.83	\$3.40	\$0.00)	\$41.21		
	4	55	\$27.98	\$9.83	\$3.40	\$0.00)	\$41.21		
	5	70	\$35.61	\$9.83	\$16.51	\$0.00)	\$61.95		
	6	70	\$35.61	\$9.83	\$16.51	\$0.00)	\$61.95		
	7	80	\$40.70	\$9.83	\$18.24	\$0.00		\$68.77		
	8	80	\$40.70	\$9.83	\$18.24	\$0.00)	\$68.77		
	Notes									
	Appre	entice to Journeyworker Ratio:1:5	5							
CARPENTER	WOOD	FRAME	10/01/2024	\$26.65	\$7.02	\$4.80	\$0.00	\$38.47		
CARPENTERS-ZO	ONE 3 (Woo	od Frame)	10/01/2025	\$27.75	\$7.02	\$4.80	\$0.00	\$39.57		
			10/01/2026	\$28.85	\$7.02	\$4.80	\$0.00	\$40.67		

Issue Date: 04/18/2025

All Aspects of New Wood Frame Work

Effective	e Date -	10/01/2024	Appropriate Dage Wage	Uaalth	Dancian	Supplemental	Total Pata	
<u></u>			Apprentice Base wage			taaa		
1	60		\$15.99	\$7.02	\$0.00	\$0.00	\$23.01	
2	60		\$15.99	\$7.02	\$0.00	\$0.00	\$23.01	
3	65		\$17.32	\$7.02	\$1.00	\$0.00	\$25.34	
4	70		\$18.66	\$7.02	\$1.00	\$0.00	\$26.68	
5	75		\$19.99	\$7.02	\$4.80	\$0.00	\$31.81	
6	80		\$21.32	\$7.02	\$4.80	\$0.00	\$33.14	
7	85		\$22.65	\$7.02	\$4.80	\$0.00	\$34.47	
8	90		\$23.99	\$7.02	\$4.80	\$0.00	\$35.81	
Effectiv	e Date -	10/01/2025		TT 1/1	D '	Supplemental	T (1 D (
Step	percent		Apprentice Base wage	Health	Pension	Unemployment		
l	60		\$16.65	\$7.02	\$0.00	\$0.00	\$23.67	
2	60		\$16.65	\$7.02	\$0.00	\$0.00	\$23.67	
3	65		\$18.04	\$7.02	\$1.00	\$0.00	\$26.06	
4	70		\$19.43	\$7.02	\$1.00	\$0.00	\$27.45	
5	75		\$20.81	\$7.02	\$4.80	\$0.00	\$32.63	
6	80		\$22.20	\$7.02	\$4.80	\$0.00	\$34.02	
7	85		\$23.59	\$7.02	\$4.80	\$0.00	\$35.41	
8	90		\$24.98	\$7.02	\$4.80	\$0.00	\$36.80	
Notes:								
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Apprentice -	CARPENTER	(Wood Frame)	- Zone 3
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	Appre		Entro Eustern Muss (E	ynn)				
	Effecti	ive Date - 07/01/2024				Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Tota	ll Rate
	1	50	\$24.60	\$13.35	\$16.43	\$0.00	9	54.38
	2	60	\$29.51	\$13.35	\$19.21	\$1.80	9	63.87
	3	65	\$31.97	\$13.35	\$20.21	\$1.80	\$	667.33
	4	70	\$34.43	\$13.35	\$21.21	\$1.80	9	570.79
	5	75	\$36.89	\$13.35	\$22.21	\$1.80	9	574.25
	6	80	\$39.35	\$13.35	\$23.21	\$1.80	\$	577.71
	7	90	\$44.27	\$13.35	\$24.21	\$1.80	9	583.63
	Notes:							
		Steps 3,4 are 500 hrs. All other steps	are 1,000 hrs.					
	Appre	ntice to Journeyworker Ratio:1:3						
CHAIN SAW OPERATOR			12/01/2024	4 \$39.20	\$9.90	\$18.36	\$0.00	\$67.46
LABORERS - ZONE	52		06/01/202	5 \$40.59	\$9.90	\$18.36	\$0.00	\$68.85
			12/01/202	5 \$41.97	\$9.90	\$18.36	\$0.00	\$70.23
			06/01/2020	5 \$43.41	\$9.90	\$18.36	\$0.00	\$71.67
		12/01/2020	5 \$44.85	\$9.90	\$18.36	\$0.00	\$73.11	
			06/01/202	7 \$46.30	\$9.90	\$18.36	\$0.00	\$74.56
			12/01/202	7 \$47.75	\$9.90	\$18.36	\$0.00	\$76.01
			06/01/202	8 \$49.25	\$9.90	\$18.36	\$0.00	\$77.51
			12/01/202	8 \$50.75	5 \$9.90	\$18.36	\$0.00	\$79.01
For apprentice	rates see '	'Apprentice- LABORER"						
CLAM SHELLS	S/SLUR	RY BUCKETS/HEADING MACHIN	IES 12/01/2024	4 \$58.18	\$15.55	\$16.50	\$0.00	\$90.23
			06/01/202	5 \$59.51	\$15.55	\$16.50	\$0.00	\$91.56
			12/01/202	5 \$60.98	\$15.55	\$16.50	\$0.00	\$93.03
			06/01/2020	5 \$62.31	\$15.55	\$16.50	\$0.00	\$94.36
E ci			12/01/2020	5 \$63.79	\$15.55	\$16.50	\$0.00	\$95.84
	rates see	ATOD					** **	
OPERATING ENGL	NEERS LO	OCAL 4	12/01/2024	4 \$36.67	\$15.55	\$16.50	\$0.00	\$68.72
			06/01/202:	5 \$37.52	2 \$15.55	\$16.50	\$0.00	\$69.57
			12/01/202	5 \$38.47	\$15.55	\$16.50	\$0.00	\$70.52
			06/01/2020	5 \$39.33	\$15.55	\$16.50	\$0.00	\$71.38
For apprentice	rates see '	'Apprentice- OPERATING ENGINEERS"	12/01/2020	5 \$40.28	\$15.55	\$16.50	\$0.00	\$72.33
DELEADER (B PAINTERS LOCAL	BRIDGE 35 - ZONI	() E 2	01/01/202	5 \$58.46	5 \$9.95	\$23.95	\$0.00	\$92.36

Apprentice -	CEMENT MASONRY/PLASTERING - Eastern Mass (Ly	vnn)

	Effectiv	ve Date - (01/01/2025				Supplemental		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	e
	1	50		\$29.23	\$9.95	\$0.00	\$0.00	\$39.18	3
	2	55		\$32.15	\$9.95	\$6.66	\$0.00	\$48.76	ō
	3	60		\$35.08	\$9.95	\$7.26	\$0.00	\$52.29)
	4	65		\$38.00	\$9.95	\$7.87	\$0.00	\$55.82	!
	5	70		\$40.92	\$9.95	\$20.32	\$0.00	\$71.19)
	6	75		\$43.85	\$9.95	\$20.93	\$0.00	\$74.73	ł
	7	80		\$46.77	\$9.95	\$21.53	\$0.00	\$78.25	;
	8	90		\$52.61	\$9.95	\$22.74	\$0.00	\$85.30)
	Notes:								
		Steps are 75	i0 hrs.					ĺ	
	Apprer	ntice to Jour	neyworker Ratio:1:1						
DEMO: ADZEN	MAN			12/02/2024	\$46.25	\$9.90	\$18.90	\$0.00	\$75.05
LADORERS - ZONE	. 2			06/02/2025	\$47.75	\$9.90	\$18.90	\$0.00	\$76.55
				12/01/2025	\$49.25	\$9.90	\$18.90	\$0.00	\$78.05
				06/01/2026	\$50.80	\$9.90	\$18.90	\$0.00	\$79.60
				12/07/2026	\$52.30	\$9.90	\$18.90	\$0.00	\$81.10
				06/07/2027	\$53.90	\$9.90	\$18.90	\$0.00	\$82.70
				12/06/2027	\$55.50	\$9.90	\$18.90	\$0.00	\$84.30
				06/05/2028	\$57.18	\$9.90	\$18.90	\$0.00	\$85.98
				12/04/2028	\$58.85	\$9.90	\$18.90	\$0.00	\$87.65
For apprentice r	rates see "A	Apprentice- LAE	BORER"						
LABORERS - ZONE	HOE/LO 2	ADEK/HAN	IMER OPERATOR	12/02/2024	\$47.25	5 \$9.90	\$18.90	\$0.00	\$76.05
				06/02/2025	\$48.75	5 \$9.90	\$18.90	\$0.00	\$77.55
				12/01/2025	\$50.25	5 \$9.90	\$18.90	\$0.00	\$79.05
				06/01/2026	\$51.80) \$9.90	\$18.90	\$0.00	\$80.60
				12/07/2026	\$53.30) \$9.90	\$18.90	\$0.00	\$82.10
				06/07/2027	\$54.90) \$9.90	\$18.90	\$0.00	\$83.70
				12/06/2027	\$56.50) \$9.90	\$18.90	\$0.00	\$85.30
				06/05/2028	\$58.18	\$ \$9.90	\$18.90	\$0.00	\$86.98
For apprentice	rates see "A	Apprentice- LAE	BORER"	12/04/2028	\$59.85	\$9.90	\$18.90	\$0.00	\$88.65
DEMO: BURNH	ERS			12/02/2024	\$47.00	0 9 9 9 0	\$18.90	\$0.00	\$75.80
LABORERS - ZONE	2			06/02/2025	\$48.50) \$9.90	\$18.90	\$0.00	\$77.30
				12/01/2025	\$50.00) \$9.90	\$18.90	\$0.00	\$78.80
				06/01/2025	\$51.54	5 \$9.90	\$18.90	\$0.00	\$80.35
				12/07/2026	\$53.04	5 \$9.90	\$18.90	\$0.00	\$81.85
				06/07/2023	\$54.64	5 \$9.90	\$18.90	\$0.00	\$83.45
				12/06/2027	\$56.24	5 \$9.90	\$18.90	\$0.00	\$85.05
				06/05/2028	\$57.93	\$9.90	\$18.90	\$0.00	\$86.73
				12/04/2028	\$59.60) \$9.90	\$18.90	\$0.00	\$88.40
							· · · · · · · · · · · · · · · ·		

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Classification Effective Date Base Wage Health Pension Une	nemental Total Rate
For apprentice rates see "Apprentice- LABORER"	npioyment
DEMO: CONCRETE CUTTER/SAWYER 12/02/2024 \$47.25 \$9.90 \$18.90 \$().00 \$76.05
LABORERS - ZONE 2 06/02/2025 \$48.75 \$9.90 \$18.90 \$0).00 \$77.55
12/01/2025 \$50.25 \$9.90 \$18.90 \$0).00 \$79.05
06/01/2026 \$51.80 \$9.90 \$18.90 \$0).00 \$80.60
12/07/2026 \$53.30 \$9.90 \$18.90 \$0).00 \$82.10
06/07/2027 \$54.90 \$9.90 \$18.90 \$0).00 \$83.70
12/06/2027 \$56.50 \$9.90 \$18.90 \$0).00 \$85.30
06/05/2028 \$58.18 \$9.90 \$18.90 \$0).00 \$86.98
12/04/2028 \$59.85 \$9.90 \$18.90 \$0).00 \$88.65
For apprentice rates see "Apprentice- LABORER"	
DEMO: JACKHAMMER OPERATOR 12/02/2024 \$47.00 \$9.90 \$18.90 \$0).00 \$75.80
06/02/2025 \$48.50 \$9.90 \$18.90 \$0).00 \$77.30
12/01/2025 \$50.00 \$9.90 \$18.90 \$0).00 \$78.80
06/01/2026 \$51.55 \$9.90 \$18.90 \$0).00 \$80.35
12/07/2026 \$53.05 \$9.90 \$18.90 \$0).00 \$81.85
06/07/2027 \$54.65 \$9.90 \$18.90 \$0).00 \$83.45
12/06/2027 \$56.25 \$9.90 \$18.90 \$0).00 \$85.05
06/05/2028 \$57.93 \$9.90 \$18.90 \$0).00 \$86.73
12/04/2028 \$59.60 \$9.90 \$18.90 \$0).00 \$88.40
Por apprentice rates see "Apprentice- LABOREK"	
DEMO: WRECKING LABORER 12/02/2024 \$46.25 \$9.90 \$18.90 \$0 LABORERS - ZONE 2 \$10.00).00 \$75.05
06/02/2025 \$47.75 \$9.90 \$18.90 \$0).00 \$76.55
12/01/2025 \$49.25 \$9.90 \$18.90 \$0).00 \$78.05
06/01/2026 \$50.80 \$9.90 \$18.90 \$0).00 \$79.60
12/07/2026 \$52.30 \$9.90 \$18.90 \$0).00 \$81.10
06/07/2027 \$53.90 \$9.90 \$18.90 \$0).00 \$82.70
12/06/2027 \$55.50 \$9.90 \$18.90 \$0).00 \$84.30
06/05/2028 \$57.18 \$9.90 \$18.90 \$0).00 \$85.98
Eor apprentice rates see "Apprentice- LABORER" 12/04/2028 \$58.85 \$9.90 \$18.90 \$0).00 \$87.65
DIRECTIONAL DRILL MACHINE OPERATOR 12/01/2024 \$56.40 \$15.55 \$16.50 \$() 00 \$88.45
OPERATING ENGINEERS LOCAL 4 0 0 0 12/01/2025 \$57,49 \$15,55 \$16,50 \$(3.00 588.43
12/01/2025 \$57.08 \$15.55 \$16.50 \$0	3.00 $3.09.73$
12/01/2025 599.12 $$15.55$ $$16.50$ $$($).00 \$91.17
12/01/2026 15.55 16.50 50).00 \$92.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	J.00 \$93.89
DIVER 08/01/2024 \$78.11 \$10.08 \$21.66 \$0	0.00 \$109.85
PILE DRIVER LOCAL 56 (ZONE 1)	
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Diver wage 70/80/90 2A \$69.83, 3A \$91.79,4A \$102.14 Total Rate	
DIVER TENDER 08/01/2024 \$55.79 \$10.08 \$24.29 \$0	0.00 \$90.16
PILE DRIVER LOCAL 56 (ZONE 1)	
as of 8-1-24, Apprentices with diving licenses begin at second year. % of Piledriver wage 70/80/90 2A \$54.20, 3A \$73.93,4A \$82.05 Total Rate	
DIVER TENDER (EFFLUENT) 08/01/2024 \$83.69 \$10.08 \$24.29 \$6 PILE DRIVER LOCAL 56 (ZONE 1) 08/01/2024 \$83.69 \$10.08 \$24.29 \$6).00 \$118.06

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 1)	08/01/2024	\$117.16	\$10.08	\$24.29	\$0.00	\$151.53
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) DRAWBRIDGE - SEIU LOCAL 888	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53
ELECTRICIAN	03/01/2025	\$64.26	\$13.00	\$23.03	\$0.00	\$100.29
ELECTRICIANS LOCAL 103	09/01/2025	\$66.17	\$13.00	\$23.09	\$0.00	\$102.26
	03/01/2026	\$67.37	\$13.00	\$23.12	\$0.00	\$103.49
	09/01/2026	\$69.28	\$13.00	\$23.18	\$0.00	\$105.46
	03/01/2027	\$70.47	\$13.00	\$23.21	\$0.00	\$106.68
	09/01/2027	\$72.39	\$13.00	\$23.27	\$0.00	\$108.66
	03/01/2028	\$73.59	\$13.00	\$23.31	\$0.00	\$109.90

Apprentice - ELECTRICIAN - Local 103

Effecti	ve Date - 03/01/2025				Supplemental		
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	40	\$25.70	\$13.00	\$0.77	\$0.00	\$39.47	
2	40	\$25.70	\$13.00	\$0.77	\$0.00	\$39.47	
3	45	\$28.92	\$13.00	\$17.17	\$0.00	\$59.09	
4	45	\$28.92	\$13.00	\$17.17	\$0.00	\$59.09	
5	50	\$32.13	\$13.00	\$17.70	\$0.00	\$62.83	
6	55	\$35.34	\$13.00	\$18.24	\$0.00	\$66.58	
7	60	\$38.56	\$13.00	\$18.77	\$0.00	\$70.33	
8	65	\$41.77	\$13.00	\$19.30	\$0.00	\$74.07	
9	70	\$44.98	\$13.00	\$19.83	\$0.00	\$77.81	
10	75	\$48.20	\$13.00	\$20.37	\$0.00	\$81.57	

Effect	ive Date - 09/01/2025				Supplemental	
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	40	\$26.47	\$13.00	\$0.79	\$0.00	\$40.26
2	40	\$26.47	\$13.00	\$0.79	\$0.00	\$40.26
3	45	\$29.78	\$13.00	\$17.19	\$0.00	\$59.97
4	45	\$29.78	\$13.00	\$17.19	\$0.00	\$59.97
5	50	\$33.09	\$13.00	\$17.73	\$0.00	\$63.82
6	55	\$36.39	\$13.00	\$18.27	\$0.00	\$67.66
7	60	\$39.70	\$13.00	\$18.80	\$0.00	\$71.50
8	65	\$43.01	\$13.00	\$19.34	\$0.00	\$75.35
9	70	\$46.32	\$13.00	\$19.87	\$0.00	\$79.19
10	75	\$49.63	\$13.00	\$20.41	\$0.00	\$83.04
Notes:						
Appre	entice to Journeyworker R	atio:2:3***				
OR CONSTRUCTOR	UCTOR 25 LOCAL 4	01/01/2022	2 \$65.6	2 \$16.03	\$20.21	\$0.00 \$10

	Effectiv	ve Date - 01/01/2	2022				Supplemental			
	Step	percent	А	pprentice Base Wage	Health	Pension	Unemployment	To	otal Rate	
	1	50		\$32.81	\$16.03	\$0.00	\$0.00		\$48.84	
	2	55		\$36.09	\$16.03	\$20.21	\$0.00		\$72.33	
	3	65		\$42.65	\$16.03	\$20.21	\$0.00		\$78.89	
	4	70		\$45.93	\$16.03	\$20.21	\$0.00		\$82.17	
	5	80		\$52.50	\$16.03	\$20.21	\$0.00		\$88.74	
	Notes:	Steps 1-2 are 6 mo								
		1								
	Apprei	ntice to Journeywo	rker Ratio:1:1							
ELEVATOR CO	NSTRU RUCTORS	JCTOR HELPER S LOCAL 4		01/01/2022	2 \$45.93	\$16.03	\$20.21	\$0.00	5	\$82.17
For apprentice 1	rates see ".	Apprentice - ELEVATOR	R CONSTRUCTOR"							
FENCE & GUA LABORERS - ZONE	RD RA	IL ERECTOR (HEA Y & <i>HIGHWAY</i>)	AVY & HIGHWAY)	12/01/2024	4 \$39.20	\$9.90	\$18.46	\$0.00	:	\$67.56
	ţ.			06/01/2023	5 \$40.59	\$9.90	\$18.46	\$0.00	:	\$68.95
				12/01/2023	5 \$41.97	\$9.90	\$18.46	\$0.00	:	\$70.33
				06/01/2020	5 \$43.41	\$9.90	\$18.46	\$0.00	:	\$71.77
For apprentice 1	rates see ".	Apprentice- LABORER	(Heavy and Highway)	12/01/2020	5 \$44.85	\$9.90	\$18.46	\$0.00	5	\$73.21
FIELD ENG.IN	ST.PER	SON-BLDG,SITE,	HVY/HWY	11/01/2024	4 \$51.78	\$15.30	\$16.40	\$0.00		\$83.48
OPERATING ENGIN	NEERS LO	DCAL 4		05/01/202:	5 \$53.22	\$15.30	\$16.40	\$0.00	;	\$84.92
				11/01/2025	5 \$54.51	\$15.30	\$16.40	\$0.00	ļ	\$86.21
				05/01/2020	5 \$55.95	\$15.30	\$16.40	\$0.00	;	\$87.65
				11/01/2020	5 \$57.24	\$15.30	\$16.40	\$0.00	:	\$88.94
For apprentice	rates see ".	Apprentice- OPERATIN	G ENGINEERS"	05/01/2027	7 \$58.67	\$15.30	\$16.40	\$0.00	1	\$90.37
FIELD ENG.PA	RTY CH	HIEF-BLDG,SITE,I	HVY/HWY	11/01/2024	4 \$53.37	\$15.30	\$16.40	\$0.00		\$85.07
OPERATING ENGIN	NEERS LO	OCAL 4		05/01/202	5 \$54.82	\$15.30	\$16.40	\$0.00		\$86.52
				11/01/2025	5 \$56.12	\$15.30	\$16.40	\$0.00		\$87.82
				05/01/2020	5 \$57.57	\$15.30	\$16.40	\$0.00		\$89.27
				11/01/2026	5 \$58.87	\$15.30	\$16.40	\$0.00	1	\$90.57
				05/01/202	7 \$60.32	\$15.30	\$16.40	\$0.00	:	\$92.02
For apprentice i	rates see ".	Apprentice- OPERATIN	G ENGINEERS"							
FIELD ENG.RC	DD PERS	SON-BLDG,SITE,I	HVY/HWY	11/01/2024	\$25.37	\$15.30	\$16.40	\$0.00	1	\$57.07
OF ERAIING ENGIN	VLEKS LU	ICAL 4		05/01/2023	5 \$26.22	\$15.30	\$16.40	\$0.00		\$57.92
				11/01/2023	5 \$26.98	\$15.30	\$16.40	\$0.00	1	\$58.68
				05/01/2020	5 \$27.83	\$15.30	\$16.40	\$0.00	1	\$59.53
				11/01/2020	5 \$28.59	\$15.30	\$16.40	\$0.00	1	\$60.29
				05/01/2027	7 \$29.44	\$15.30	\$16.40	\$0.00	:	\$61.14

Apprentice -	ELEVATOR CONSTRUCTOR - Local 4
	01/01/0000

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIRE ALARM INSTALLER	03/01/2025	\$64.26	\$13.00	\$23.03	\$0.00	\$100.29
ELECTRICIANS LOCAL 103	09/01/2025	\$66.17	\$13.00	\$23.09	\$0.00	\$102.26
	03/01/2026	\$67.37	\$13.00	\$23.12	\$0.00	\$103.49
	09/01/2026	\$69.28	\$13.00	\$23.18	\$0.00	\$105.46
	03/01/2027	\$70.47	\$13.00	\$23.21	\$0.00	\$106.68
	09/01/2027	\$72.39	\$13.00	\$23.27	\$0.00	\$108.66
	03/01/2028	\$73.59	\$13.00	\$23.31	\$0.00	\$109.90
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE	03/01/2025	\$51.41	\$13.00	\$20.90	\$0.00	\$85.31
/ COMMISSIONINGELECTRICIANS	09/01/2025	\$52.94	\$13.00	\$20.95	\$0.00	\$86.89
	03/01/2026	\$53.90	\$13.00	\$20.98	\$0.00	\$87.88
	09/01/2026	\$55.42	\$13.00	\$21.02	\$0.00	\$89.44
	03/01/2027	\$56.38	\$13.00	\$21.05	\$0.00	\$90.43
	09/01/2027	\$57.91	\$13.00	\$21.10	\$0.00	\$92.01
	03/01/2028	\$58.87	\$13.00	\$21.13	\$0.00	\$93.00
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER)	12/01/2024	\$45.96	\$15.55	\$16.50	\$0.00	\$78.01
OPERAIING ENGINEERS LOCAL 4	06/01/2025	\$47.02	\$15.55	\$16.50	\$0.00	\$79.07
	12/01/2025	\$48.19	\$15.55	\$16.50	\$0.00	\$80.24
	06/01/2026	\$49.25	\$15.55	\$16.50	\$0.00	\$81.30
	12/01/2026	\$50.43	\$15.55	\$16.50	\$0.00	\$82.48
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY)	12/01/2024	\$27.01	\$9.90	\$18.46	\$0.00	\$55.37
LADOKEKS - ZONE 2 (HEAVI & HIGHWAI)	06/01/2025	\$28.09	\$9.90	\$18.46	\$0.00	\$56.45
	12/01/2025	\$28.09	\$9.90	\$18.46	\$0.00	\$56.45
	06/01/2026	\$29.21	\$9.90	\$18.46	\$0.00	\$57.57
	12/01/2026	\$29.21	\$9.90	\$18.46	\$0.00	\$57.57
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FLOORCOVERER	03/01/2025	\$57.73	\$8.83	\$20.27	\$0.00	\$86.83
FLOORCOVERERS LOCAL 2108 ZONE I	09/01/2025	\$59.23	\$8.83	\$20.27	\$0.00	\$88.33
	03/01/2026	\$60.73	\$8.83	\$20.27	\$0.00	\$89.83
	09/01/2026	\$62.23	\$8.83	\$20.27	\$0.00	\$91.33
	03/01/2027	\$63.73	\$8.83	\$20.27	\$0.00	\$92.83

Effect	ive Date - 03/01/2025				Supplemental	T . 1 D .
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	45	\$25.98	\$8.83	\$1.76	\$0.00	\$36.57
2	45	\$25.98	\$8.83	\$1.76	\$0.00	\$36.57
3	55	\$31.75	\$8.83	\$3.52	\$0.00	\$44.10
4	55	\$31.75	\$8.83	\$3.52	\$0.00	\$44.10
5	70	\$40.41	\$8.83	\$16.75	\$0.00	\$65.99
6	70	\$40.41	\$8.83	\$16.75	\$0.00	\$65.99
7	80	\$46.18	\$8.83	\$18.51	\$0.00	\$73.52
8	80	\$46.18	\$8.83	\$18.51	\$0.00	\$73.52

Apprentice - FLOORCOVERER - Local 2168 Zone I

Effective Date - 09/01/2025

Effect	ive Date - 09/01/2025	Appropriate Dage Wage	Ugalth	Donaion	Supplemental	Total Data
Step	percent	Apprentice Base wage	псани	Felisioli	Onemployment	Iotal Kate
1	45	\$26.65	\$8.83	\$1.76	\$0.00	\$37.24
2	45	\$26.65	\$8.83	\$1.76	\$0.00	\$37.24
3	55	\$32.58	\$8.83	\$3.52	\$0.00	\$44.93
4	55	\$32.58	\$8.83	\$3.52	\$0.00	\$44.93
5	70	\$41.46	\$8.83	\$16.75	\$0.00	\$67.04
6	70	\$41.46	\$8.83	\$16.75	\$0.00	\$67.04
7	80	\$47.38	\$8.83	\$18.51	\$0.00	\$74.72
8	80	\$47.38	\$8.83	\$18.51	\$0.00	\$74.72
Notes	: Steps are 750 hrs.					

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER	12/01/2024	\$57.03	\$15.55	\$16.50	\$0.00	\$89.08
OPERATING ENGINEERS LOCAL 4	06/01/2025	\$58.33	\$15.55	\$16.50	\$0.00	\$90.38
	12/01/2025	\$59.78	\$15.55	\$16.50	\$0.00	\$91.83
	06/01/2026	\$61.08	\$15.55	\$16.50	\$0.00	\$93.13
	12/01/2026	\$62.53	\$15.55	\$16.50	\$0.00	\$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS	12/01/2024	\$36.67	\$15.55	\$16.50	\$0.00	\$68.72
OPERATING ENGINEERS LOCAL 4	06/01/2025	\$37.52	\$15.55	\$16.50	\$0.00	\$69.57
	12/01/2025	\$38.47	\$15.55	\$16.50	\$0.00	\$70.52
	06/01/2026	\$39.33	\$15.55	\$16.50	\$0.00	\$71.38
	12/01/2026	\$40.28	\$15.55	\$16.50	\$0.00	\$72.33
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)	01/01/2025	\$47.96	\$9.95	\$23.95	\$0.00	\$81.86

GLAZIERS LOCAL 35 (ZONE 2)

Eff	fective Date -	01/01/2025				Supplemental			
Ste	ep percent		Apprentice Base Wage	Health	Pension	Unemployment	То	tal Rate	
1	50		\$23.98	\$9.95	\$0.00	\$0.00		\$33.93	
2	55		\$26.38	\$9.95	\$6.66	\$0.00		\$42.99	
3	60		\$28.78	\$9.95	\$7.26	\$0.00		\$45.99	
4	65		\$31.17	\$9.95	\$7.87	\$0.00		\$48.99	
5	70		\$33.57	\$9.95	\$20.32	\$0.00		\$63.84	
6	75		\$35.97	\$9.95	\$20.93	\$0.00		\$66.85	
7	80		\$38.37	\$9.95	\$21.53	\$0.00		\$69.85	
8	90		\$43.16	\$9.95	\$22.74	\$0.00		\$75.85	
No	otes:								
	Steps are	750 hrs.							
Ар	prentice to Jo	urneyworker Ratio:1:1							
HOISTING ENGIN	EER/CRANES	GRADALLS	12/01/2024	\$57.03	\$15.55	\$16.50	\$0.00		\$89.08
OPERATING ENGINEEI	RS LOCAL 4		06/01/2025	\$58.33	\$15.55	\$16.50	\$0.00		\$90.38
			12/01/2025	\$59.78	\$15.55	\$16.50	\$0.00		\$91.83
			06/01/2026	5 \$61.08	\$15.55	\$16.50	\$0.00		\$93.13

12/01/2026

\$62.53

\$15.55

\$16.50

\$0.00

\$94.58

Apprentice -	GLAZIER - Local 35 Zone 2
Effective Date	- 01/01/2025

Effect	ive Date - 12/01/2024				Supplemental	
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	55	\$31.37	\$0.00	\$0.00	\$0.00	\$31.37
2	60	\$34.22	\$15.55	\$16.50	\$0.00	\$66.27
3	65	\$37.07	\$15.55	\$16.50	\$0.00	\$69.12
4	70	\$39.92	\$15.55	\$16.50	\$0.00	\$71.97
5	75	\$42.77	\$15.55	\$16.50	\$0.00	\$74.82
6	80	\$45.62	\$15.55	\$16.50	\$0.00	\$77.67
7	85	\$48.48	\$15.55	\$16.50	\$0.00	\$80.53
8	90	\$51.33	\$15.55	\$16.50	\$0.00	\$83.38

OPERATING ENGINEERS - Local 4 Annrentice

	Effecti	ve Date -	06/01/2025				Supplemental			
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Тс	otal Rate	
	1	55		\$32.08	\$0.00	\$0.00	\$0.00		\$32.08	
	2	60		\$35.00	\$15.55	\$16.50	\$0.00		\$67.05	
	3	65		\$37.91	\$15.55	\$16.50	\$0.00		\$69.96	
	4	70		\$40.83	\$15.55	\$16.50	\$0.00		\$72.88	
	5	75		\$43.75	\$15.55	\$16.50	\$0.00		\$75.80	
	6	80		\$46.66	\$15.55	\$16.50	\$0.00		\$78.71	
	7	85		\$49.58	\$15.55	\$16.50	\$0.00		\$81.63	
	8	90		\$52.50	\$15.55	\$16.50	\$0.00		\$84.55	
	Notes:									
	Appre	ntice to Jou	ırneyworker Ratio:1:6							
HVAC (DUCTW	VORK)			02/01/2023	5 \$59.1	3 \$14.91	\$28.27	\$2.98		\$105.29
SHEETMETAL WOR	KEKS LU	CAL 17 - A		08/01/2023	5 \$60.9	8 \$14.91	\$28.27	\$2.98		\$107.14
D				02/01/2020	5 \$62.9	3 \$14.91	\$28.27	\$2.98		\$109.09
For apprentice	rates see	CONTROL	S				*** *			
ELECTRICIANS LO	CAL 103	CONTROL	.5)	03/01/2023	5 \$64.2	6 \$13.00	\$23.03	\$0.00		\$100.29
				09/01/202:	5 \$66.1	7 \$13.00	\$23.09	\$0.00		\$102.26
				03/01/2020	5 \$67.3	7 \$13.00	\$23.12	\$0.00		\$103.49
				09/01/2020	5 \$69.2	8 \$13.00	\$23.18	\$0.00		\$105.46
				03/01/2027	7 \$70.4	7 \$13.00	\$23.21	\$0.00		\$106.68
				09/01/2027	7 \$72.3	9 \$13.00	\$23.27	\$0.00		\$108.66
For apprentice	ates see "	Apprentice- F	I ECTRICIAN"	03/01/2028	8 \$73.5	9 \$13.00	\$23.31	\$0.00		\$109.90
HVAC (TESTIN	GANE	BALANC	ZING - AIR)	02/01/2024	5 \$50.1	3 \$14.01	\$28.27	\$2.08		\$105.20
SHEETMETAL WOR	KERS LC	DCAL 17 - A		02/01/202	5 \$59.1	5 \$14.91 9 \$14.01	\$20.27 \$28.27	\$2.90		\$103.29
				08/01/202	5 \$60.9	8 \$14.91	\$20.27	\$2.90		\$107.14
For apprentice	ates see "	Apprentice- S	HEET METAL WORKER"	02/01/2020	5 \$62.9	3 \$14.91	\$28.27	\$2.98		\$109.09
HVAC (TESTIN	G ANE 4 <i>L 537 (L</i>	DBALANC ocal 138)	ING -WATER)	03/01/202:	5 \$68.8	8 \$12.70	\$21.80	\$0.00		\$103.38
For apprentice	ates see "	Apprentice- P	IPEFITTER" or "PLUMBER/PIPE	FITTER"						

Issue Date: 04/18/2025

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC MECHANIC PIPEFITTERS LOCAL 537 (Local 138)	03/01/2025	\$68.88	\$12.70	\$21.80	\$0.00	\$103.38
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS	12/01/2024	\$39.70	\$9.90	\$18.36	\$0.00	\$67.96
LABORERS - ZONE 2	06/01/2025	\$41.09	\$9.90	\$18.36	\$0.00	\$69.35
	12/01/2025	\$42.47	\$9.90	\$18.36	\$0.00	\$70.73
	06/01/2026	\$43.91	\$9.90	\$18.36	\$0.00	\$72.17
	12/01/2026	\$45.35	\$9.90	\$18.36	\$0.00	\$73.61
	06/01/2027	\$46.80	\$9.90	\$18.36	\$0.00	\$75.06
	12/01/2027	\$48.25	\$9.90	\$18.36	\$0.00	\$76.51
	06/01/2028	\$49.75	\$9.90	\$18.36	\$0.00	\$78.01
	12/01/2028	\$51.25	\$9.90	\$18.36	\$0.00	\$79.51
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY)	12/01/2024	\$39.70	\$9.90	\$18.46	\$0.00	\$68.06
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	06/01/2025	\$41.09	\$9.90	\$18.46	\$0.00	\$69.45
	12/01/2025	\$42.47	\$9.90	\$18.46	\$0.00	\$70.83
	06/01/2026	\$43.91	\$9.90	\$18.46	\$0.00	\$72.27
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)	12/01/2026	\$45.35	\$9.90	\$18.46	\$0.00	\$73.71
INSULATOR (PIPES & TANKS)	09/01/2024	\$56.92	\$14.75	\$19.61	\$0.00	\$91.28
HEAT & FROST INSULATORS LOCAL 6 (BOSTON)	09/01/2025	\$60.34	\$14.75	\$19.61	\$0.00	\$94.70
	09/01/2026	\$63.76	\$14.75	\$19.61	\$0.00	\$98.12

Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston

Effect	ive Date -	09/01/2024				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50		\$28.46	\$14.75	\$14.32	\$0.00	\$57.53	
2	60		\$34.15	\$14.75	\$15.37	\$0.00	\$64.27	
3	70		\$39.84	\$14.75	\$16.43	\$0.00	\$71.02	
4	80		\$45.54	\$14.75	\$17.49	\$0.00	\$77.78	

Effect	ive Date - 09/01/2025				Supplemental		
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50	\$30.17	\$14.75	\$14.32	\$0.00	\$59.24	
2	60	\$36.20	\$14.75	\$15.37	\$0.00	\$66.32	
3	70	\$42.24	\$14.75	\$16.43	\$0.00	\$73.42	
4	80	\$48.27	\$14.75	\$17.49	\$0.00	\$80.51	
Notes						- — — —	
	Steps are 1 year					i	
Appre	entice to Journeyworker Ratio:1:4						
IRONWORKER/WEL	DER AWRENCE AREA)	03/16/2024	\$49.56	\$8.35	\$26.70	\$0.00 \$84.61	

	Effect	ive Date - 03/16/2024	24			Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	9
	1	60	\$29.74	\$8.35	\$26.70	\$0.00	\$64.79)
	2	70	\$34.69	\$8.35	\$26.70	\$0.00	\$69.74	1
	3	75	\$37.17	\$8.35	\$26.70	\$0.00	\$72.22	2
	4	80	\$39.65	\$8.35	\$26.70	\$0.00	\$74.70)
	5	85	\$42.13	\$8.35	\$26.70	\$0.00	\$77.18	3
	6	90	\$44.60	\$8.35	\$26.70	\$0.00	\$79.65	5
	Notes	- — — — — — — — — — — — — — — — — — — —						
	Appre	entice to Journeyworker Ratio:1:4						
JACKHAMME	R & PA	VING BREAKER OPERATOR	12/01/2024	\$39.20	\$9.90	\$18.36	\$0.00	\$67.46
LABORERS - ZONE	2		06/01/2025	5 \$40.59	\$9.90	\$18.36	\$0.00	\$68.85
			12/01/2025	\$41.97	\$9.90	\$18.36	\$0.00	\$70.23
			06/01/2026	\$43.41	\$9.90	\$18.36	\$0.00	\$71.67
			12/01/2026	5 \$44.85	\$9.90	\$18.36	\$0.00	\$73.11
			06/01/2027	\$46.30	\$9.90	\$18.36	\$0.00	\$74.56
			12/01/2027	\$47.75	\$9.90	\$18.36	\$0.00	\$76.01
			06/01/2028	\$49.25	\$9.90	\$18.36	\$0.00	\$77.51
			12/01/2028	\$50.75	\$9.90	\$18.36	\$0.00	\$79.01
For apprentice	rates see	"Apprentice- LABORER"						
LABORER LABORERS - ZONE	2		12/01/2024	\$38.95	\$9.90	\$18.36	\$0.00	\$67.21
			06/01/2025	\$40.34	\$9.90	\$18.36	\$0.00	\$68.60
			12/01/2025	\$41.72	\$9.90	\$18.36	\$0.00	\$69.98
			06/01/2026	\$43.16	\$9.90	\$18.36	\$0.00	\$71.42
			12/01/2026	\$44.60	\$9.90	\$18.36	\$0.00	\$72.86
			06/01/2027	\$46.05	\$9.90	\$18.36	\$0.00	\$74.31
			12/01/2027	\$47.50	\$9.90	\$18.36	\$0.00	\$75.76
			06/01/2028	\$49.00	\$9.90	\$18.36	\$0.00	\$77.26
			12/01/2028	\$50.50	\$9.90	\$18.36	\$0.00	\$78.76

Apprentice - IRONWORKER - Local 7 Lawrence

	Appre Effect	ive Date -	12/01/2024						
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total R	ate
	1	60		\$23.37	\$9.90	\$18.36	\$0.00	\$51	.63
	2	70		\$27.27	\$9.90	\$18.36	\$0.00	\$55.	.53
	3	80		\$31.16	\$9.90	\$18.36	\$0.00	\$59	.42
	4	90		\$35.06	\$9.90	\$18.36	\$0.00	\$63	.32
	Effect	ive Date -	06/01/2025				Supplemental		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total R	ate
	1	60		\$24.20	\$9.90	\$18.36	\$0.00	\$52	.46
	2	70		\$28.24	\$9.90	\$18.36	\$0.00	\$56	.50
	3	80		\$32.27	\$9.90	\$18.36	\$0.00	\$60	.53
	4	90		\$36.31	\$9.90	\$18.36	\$0.00	\$64	.57
	Notes	:							
	Appre	entice to Jou	urneyworker Ratio:1:5						
LABORER	(HEAVY &	HIGHWA	Y)	12/01/2024	\$38.95	\$9.90	\$18.46	\$0.00	\$67.31
LABORERS - 2	CONE 2 (HEAV	Y & HIGHWA	Y)	06/01/2025	\$40.34	\$9.90	\$18.46	\$0.00	\$68.70
				12/01/2025	\$41.72	\$9.90	\$18.46	\$0.00	\$70.08
				06/01/2020	\$43.16	\$9.90	\$18.46	\$0.00	\$71.52
				12/01/2020	5 \$44.60	\$9.90	\$18.46	\$0.00	\$72.96

Apprentice -	LABORER (Heavy & Highway) - Zone 2
	12/01/2024

Effecti	ive Date -	12/01/2024				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	60		\$23.37	\$9.90	\$18.46	\$0.00	\$51.73	
2	70		\$27.27	\$9.90	\$18.46	\$0.00	\$55.63	
3	80		\$31.16	\$9.90	\$18.46	\$0.00	\$59.52	
4	90		\$35.06	\$9.90	\$18.46	\$0.00	\$63.42	

Effect	ive Date -	06/01/2025				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	60		\$24.20	\$9.90	\$18.46	\$0.00	\$52.56	
2	70		\$28.24	\$9.90	\$18.46	\$0.00	\$56.60	
3	80		\$32.27	\$9.90	\$18.46	\$0.00	\$60.63	
4	90		\$36.31	\$9.90	\$18.46	\$0.00	\$64.67	

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER	12/01/2024	\$38.95	\$9.90	\$18.36	\$0.00	\$67.21
LABORERS - ZONE 2	06/01/2025	\$40.34	\$9.90	\$18.36	\$0.00	\$68.60
	12/01/2025	\$41.72	\$9.90	\$18.36	\$0.00	\$69.98
	06/01/2026	\$43.16	\$9.90	\$18.36	\$0.00	\$71.42
	12/01/2026	\$44.60	\$9.90	\$18.36	\$0.00	\$72.86
	06/01/2027	\$46.05	\$9.90	\$18.36	\$0.00	\$74.31
	12/01/2027	\$47.50	\$9.90	\$18.36	\$0.00	\$75.76
	06/01/2028	\$49.00	\$9.90	\$18.36	\$0.00	\$77.26
	12/01/2028	\$50.50	\$9.90	\$18.36	\$0.00	\$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER	12/01/2024	\$38.95	\$9.90	\$18.36	\$0.00	\$67.21
	06/01/2025	\$40.34	\$9.90	\$18.36	\$0.00	\$68.60
	12/01/2025	\$41.72	\$9.90	\$18.36	\$0.00	\$69.98
	06/01/2026	\$43.16	\$9.90	\$18.36	\$0.00	\$71.42
	12/01/2026	\$44.60	\$9.90	\$18.36	\$0.00	\$72.86
	06/01/2027	\$46.05	\$9.90	\$18.36	\$0.00	\$74.31
	12/01/2027	\$47.50	\$9.90	\$18.36	\$0.00	\$75.76
	06/01/2028	\$49.00	\$9.90	\$18.36	\$0.00	\$77.26
For apprentice rates see "Apprentice- LABORER"	12/01/2028	\$50.50	\$9.90	\$18.36	\$0.00	\$78.76
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER	12/02/2024	\$39.04	\$9.90	\$18.42	\$0.00	\$67.36
LABORERS - ZONE 2	06/02/2025	\$40.43	\$9.90	\$18.42	\$0.00	\$68.75
	12/01/2025	\$41.81	\$9.90	\$18.42	\$0.00	\$70.13
	06/01/2026	\$43.25	\$9.90	\$18.42	\$0.00	\$71.57
	12/07/2026	\$44.69	\$9.90	\$18.42	\$0.00	\$73.01
	06/07/2027	\$46.14	\$9.90	\$18.42	\$0.00	\$74.46
	12/06/2027	\$47.59	\$9.90	\$18.42	\$0.00	\$75.91
	06/05/2028	\$49.09	\$9.90	\$18.42	\$0.00	\$77.41
	12/04/2028	\$50.59	\$9.90	\$18.42	\$0.00	\$78.91
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER	12/01/2024	\$39.20	\$9.90	\$18.36	\$0.00	\$67.46
LABOKERS - ZONE 2	06/01/2025	\$40.59	\$9.90	\$18.36	\$0.00	\$68.85
	12/01/2025	\$41.97	\$9.90	\$18.36	\$0.00	\$70.23
	06/01/2026	\$43.41	\$9.90	\$18.36	\$0.00	\$71.67
	12/01/2026	\$44.85	\$9.90	\$18.36	\$0.00	\$73.11
	06/01/2027	\$46.30	\$9.90	\$18.36	\$0.00	\$74.56
	12/01/2027	\$47.75	\$9.90	\$18.36	\$0.00	\$76.01
	06/01/2028	\$49.25	\$9.90	\$18.36	\$0.00	\$77.51
	12/01/2028	\$50.75	\$9.90	\$18.36	\$0.00	\$79.01
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY)	12/01/2024	\$39.20	\$9.90	\$18.46	\$0.00	\$67.56
	06/01/2025	\$40.59	\$9.90	\$18.46	\$0.00	\$68.95
	12/01/2025	\$41.97	\$9.90	\$18.46	\$0.00	\$70.33
	06/01/2026	\$43.41	\$9.90	\$18.46	\$0.00	\$71.77
	12/01/2026	\$44.85	\$9.90	\$18.46	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: MULTI-TRADE TENDER	12/01/2024	\$38.95	\$9.90	\$18.36	\$0.00	\$67.21
LABORERS - ZONE 2	06/01/2025	\$40.34	\$9.90	\$18.36	\$0.00	\$68.60
	12/01/2025	\$41.72	\$9.90	\$18.36	\$0.00	\$69.98
	06/01/2026	\$43.16	\$9.90	\$18.36	\$0.00	\$71.42
	12/01/2026	\$44.60	\$9.90	\$18.36	\$0.00	\$72.86
	06/01/2027	\$46.05	\$9.90	\$18.36	\$0.00	\$74.31
	12/01/2027	\$47.50	\$9.90	\$18.36	\$0.00	\$75.76
	06/01/2028	\$49.00	\$9.90	\$18.36	\$0.00	\$77.26
	12/01/2028	\$50.50	\$9.90	\$18.36	\$0.00	\$78.76
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER	12/01/2024	\$38.95	\$9.90	\$18.36	\$0.00	\$67.21
	06/01/2025	\$40.34	\$9.90	\$18.36	\$0.00	\$68.60
	12/01/2025	\$41.72	\$9.90	\$18.36	\$0.00	\$69.98
	06/01/2026	\$43.16	\$9.90	\$18.36	\$0.00	\$71.42
	12/01/2026	\$44.60	\$9.90	\$18.36	\$0.00	\$72.86
	06/01/2027	\$46.05	\$9.90	\$18.36	\$0.00	\$74.31
	12/01/2027	\$47.50	\$9.90	\$18.36	\$0.00	\$75.76
	06/01/2028	\$49.00	\$9.90	\$18.36	\$0.00	\$77.26
	12/01/2028	\$50.50	\$9.90	\$18.36	\$0.00	\$78.76
This classification applies to the removal of standing trees, and the trimming and rem clearance incidental to construction . For apprentice rates see "Apprentice- LABORE	oval of branches and lim R"	bs when related	to public work	is construction	or site	
LASER BEAM OPERATOR	12/01/2024	\$39.20	\$9.90	\$18.36	\$0.00	\$67.46
LABORERS - ZONE 2	06/01/2025	\$40.59	\$9.90	\$18.36	\$0.00	\$68.85
	12/01/2025	\$41.97	\$9.90	\$18.36	\$0.00	\$70.23
	06/01/2026	\$43.41	\$9.90	\$18.36	\$0.00	\$71.67
	12/01/2026	\$44.85	\$9.90	\$18.36	\$0.00	\$73.11
	06/01/2027	\$46.30	\$9.90	\$18.36	\$0.00	\$74.56
	12/01/2027	\$47.75	\$9.90	\$18.36	\$0.00	\$76.01
	06/01/2028	\$49.25	\$9.90	\$18.36	\$0.00	\$77.51
	12/01/2028	\$50.75	\$9.90	\$18.36	\$0.00	\$79.01
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY)	12/01/2024	\$39.20	\$9.90	\$18.46	\$0.00	\$67.56
LABOREKS - ZONE 2 (HEAVY & HIGHWAY)	06/01/2025	\$40.59	\$9.90	\$18.46	\$0.00	\$68.95
	12/01/2025	\$41.97	\$9.90	\$18.46	\$0.00	\$70.33
	06/01/2026	\$43.41	\$9.90	\$18.46	\$0.00	\$71.77
	12/01/2026	\$44.85	\$9.90	\$18.46	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
MARBLE & TILE FINISHERS RRICKLAYERS LOCAL 3 - MARBLE & THE	02/01/2025	\$50.36	\$11.49	\$21.62	\$0.00	\$83.47
	08/01/2025	\$52.08	\$11.49	\$21.62	\$0.00	\$85.19
	02/01/2026	\$53.16	\$11.49	\$21.62	\$0.00	\$86.27
	08/01/2026	\$54.92	\$11.49	\$21.62	\$0.00	\$88.03
	02/01/2027	\$56.04	\$11.49	\$21.62	\$0.00	\$89.15

	Effecti	ive Date -	02/01/2025	Supplemental	plemental				
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1	50		\$25.18	\$11.49	\$21.62	\$0.00	\$58.29	
	2	60		\$30.22	\$11.49	\$21.62	\$0.00	\$63.33	
	3	70		\$35.25	\$11.49	\$21.62	\$0.00	\$68.36	
	4	80		\$40.29	\$11.49	\$21.62	\$0.00	\$73.40	
	5	90		\$45.32	\$11.49	\$21.62	\$0.00	\$78.43	
	Effecti	ive Date -	08/01/2025				Supplemental		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1	50		\$26.04	\$11.49	\$21.62	\$0.00	\$59.15	
	2	60		\$31.25	\$11.49	\$21.62	\$0.00	\$64.36	
	3	70		\$36.46	\$11.49	\$21.62	\$0.00	\$69.57	
	4	80		\$41.66	\$11.49	\$21.62	\$0.00	\$74.77	
	5	90		\$46.87	\$11.49	\$21.62	\$0.00	\$79.98	
	Notes:								
	İ								
	Appre	ntice to Jo	urneyworker Ratio:1:3						
MARBLE MAS	SONS,T	ILELAYER	S & TERRAZZO MECH	02/01/202	5 \$65.82	2 \$11.49	\$23.56	\$0.00	\$100.87
BRICKLAYERS LO	CAL 3 - M	AKBLE & IIL	E	08/01/202	5 \$67.9	7 \$11.49	\$23.56	\$0.00	\$103.02
				02/01/2020	5 \$69.32	2 \$11.49	\$23.56	\$0.00	\$104.37
				08/01/2020	5 \$71.52	2 \$11.49	\$23.56	\$0.00	\$106.57
				02/01/2027	7 \$72.92	2 \$11.49	\$23.56	\$0.00	\$107.97

Apprentice -MARBLE & TILE FINISHER - Local 3 Marble & TileEffective Date -02/01/2025

Effective Date - 02/		02/01/2025				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50		\$32.91	\$11.49	\$23.56	\$0.00	\$67.96	
2	60		\$39.49	\$11.49	\$23.56	\$0.00	\$74.54	
3	70		\$46.07	\$11.49	\$23.56	\$0.00	\$81.12	
4	80		\$52.66	\$11.49	\$23.56	\$0.00	\$87.71	
5	90		\$59.24	\$11.49	\$23.56	\$0.00	\$94.29	
Effecti	ive Date -	08/01/2025				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	50		\$33.99	\$11.49	\$23.56	\$0.00	\$69.04	
2	60		\$40.78	\$11.49	\$23.56	\$0.00	\$75.83	
3	70		\$47.58	\$11.49	\$23.56	\$0.00	\$82.63	
4	80		\$54.38	\$11.49	\$23.56	\$0.00	\$89.43	
5	90		\$61.17	\$11.49	\$23.56	\$0.00	\$96.22	
Notes:								
İ								
Appre	ntice to Jo	urneyworker Ratio:1:5						
MECH. SWEEPER OP	ERATOR (ON CONST. SITES)	12/01/2024	\$56.40	\$15.55	\$16.50	\$0.00	\$88.45
OPERATING ENGINEERS LO	OCAL 4		06/01/2025	5 \$57.68	\$15.55	\$16.50	\$0.00	\$89.73
			12/01/2025	5 \$59.12	\$15.55	\$16.50	\$0.00	\$91.17
			06/01/2026	5 \$60.40	\$15.55	\$16.50	\$0.00	\$92.45
For apprentice rates see '	"Apprentice (DED ATING ENGINEEDS"	12/01/2026	\$61.84	\$15.55	\$16.50	\$0.00	\$93.89
MECHANICS MAINT	FNANCE		12/01/202	1 \$56.40	¢15.55	¢1(50		\$00.45
OPERATING ENGINEERS LO	OCAL 4		12/01/2024	+ \$56.40	\$15.55	\$10.50	\$0.00	\$88.45
			06/01/2023	5 557.68	\$15.55	\$10.50	\$0.00	\$89.73
			12/01/2023	\$59.12	\$15.55	\$16.50	\$0.00	\$91.17
			06/01/2026	5 \$60.40	\$15.55	\$10.50	20.00	\$92.45
For apprentice rates see '	"Apprentice- C	PPERATING ENGINEERS"	12/01/2026	\$61.84	\$15.55	\$16.50	\$0.00	\$93.89
MILLWRIGHT (Zone 2	2)		01/06/2025	5 \$45.09	\$10.08	\$21.47	\$0.00	\$76.64
MILLWRIGHTS LOCAL 1121	- Zone 2		01/05/2026	5 \$47.42	\$10.08	\$21.47	\$0.00	\$78.97

Apprentice -MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & TileEffective Date -02/01/2025

	Effecti	ive Date -	01/06/2025				Supplemental		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	è
	1	55		\$24.80	\$10.08	\$5.50	\$0.00	\$40.38	3
	2	65		\$29.31	\$10.08	\$6.50	\$0.00	\$45.89)
	3	75		\$33.82	\$10.08	\$18.97	\$0.00	\$62.87	1
	4	85		\$38.33	\$10.08	\$19.97	\$0.00	\$68.38	}
	Effect i Step	ive Date - percent	01/05/2026	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate	2
	1	55		\$26.08	\$10.08	\$5.50	\$0.00	\$41.66	5
	2	65		\$30.82	\$10.08	\$6.50	\$0.00	\$47.40)
	3	75		\$35.57	\$10.08	\$18.97	\$0.00	\$64.62	2
	4	85		\$40.31	\$10.08	\$19.97	\$0.00	\$70.36	5
	Notes:	Step 1&2 A but do rec Steps are 2 ntice to Jou	Appr. indentured after 1/6/20 eive annuity. (Step 1 \$5.72, 2,000 hours arneyworker Ratio:1:4	020 receive no pension, Step 2 \$6.66)				 	
MORTAR MIX	ER			12/01/2024	4 \$39.20	\$9.90	\$18.36	\$0.00	\$67.46
LABORERS - ZONE	Ξ2			06/01/2023	5 \$40.59	\$9.90	\$18.36	\$0.00	\$68.85
				12/01/202:	5 \$41.97	\$9.90	\$18.36	\$0.00	\$70.23
				06/01/2020	5 \$43.41	\$9.90	\$18.36	\$0.00	\$71.67
				12/01/2020	5 \$44.85	\$9.90	\$18.36	\$0.00	\$73.11
				06/01/202	7 \$46.30	\$9.90	\$18.36	\$0.00	\$74.56
				12/01/2027	7 \$47.75	\$9.90	\$18.36	\$0.00	\$76.01
				06/01/2028	8 \$49.25	\$9.90	\$18.36	\$0.00	\$77.51
For appropriate	rates see !	'Appropriate I		12/01/2028	8 \$50.75	\$9.90	\$18.36	\$0.00	\$79.01
OILER (OTHE)	R THAN	Apprende- L	CRANES GRADALLS)	12/01/202	4 \$25.27	¢15.20	\$16.40	 \$0.00	¢57.07
OPERATING ENGI	NEERS LO	OCAL 4		06/01/2024	+ \$23.37 5 \$25.07	\$15.50 \$15.20	\$16.40	\$0.00	\$37.07 \$57.67
				12/01/202	5 \$25.97	\$15.30	\$16.40	\$0.00	\$57.07
				06/01/202	5 \$20.05 5 \$27.22	\$15.30	\$16.40	\$0.00	\$58.93
				12/01/2020	5 \$27.22	\$15.30 \$15.30	\$16.40	\$0.00	\$50.52
For apprentice	rates see '	'Apprentice- O	PERATING ENGINEERS"	12/01/2020	5 \$27.67	\$15.50	φ10.10	φ0.00	φ.σ.σ.σ.σ.σ.σ.σ.σ.σ.σ.σ.σ.σ.σ.σ.σ.σ.σ.σ
OILER (TRUC	K CRAI	NES, GRAI	DALLS)	12/01/2024	4 \$31.08	\$15.30	\$16.40	\$0.00	\$62.78
OPERATING ENGI	NEERS LO	OCAL 4		06/01/2023	5 \$31.80	\$15.30	\$16.40	\$0.00	\$63.50
				12/01/202	5 \$32.60	\$15.30	\$16.40	\$0.00	\$64.30
				06/01/2020	5 \$33.32	\$15.30	\$16.40	\$0.00	\$65.02
				12/01/2020	5 \$34.12	\$15.30	\$16.40	\$0.00	\$65.82

Apprentice - MILLWRIGHT - Local 1121 Zone 2

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
OTHER POWER DRIVEN EQUIPMENT - CLASS II	12/01/2024	\$56.40	\$15.55	\$16.50	\$0.00	\$88.45
PERATING ENGINEERS LOCAL 4	06/01/2025	\$57.68	\$15.55	\$16.50	\$0.00	\$89.73
	12/01/2025	\$59.12	\$15.55	\$16.50	\$0.00	\$91.17
	06/01/2026	\$60.40	\$15.55	\$16.50	\$0.00	\$92.45
	12/01/2026	\$61.84	\$15.55	\$16.50	\$0.00	\$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 - ZONE 2	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

Effecti Step	percent 01/01/2025	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.23	\$9.95	\$0.00	\$0.00	\$39.18
2	55	\$32.15	\$9.95	\$6.66	\$0.00	\$48.76
3	60	\$35.08	\$9.95	\$7.26	\$0.00	\$52.29
4	65	\$38.00	\$9.95	\$7.87	\$0.00	\$55.82
5	70	\$40.92	\$9.95	\$20.32	\$0.00	\$71.19
6	75	\$43.85	\$9.95	\$20.93	\$0.00	\$74.73
7	80	\$46.77	\$9.95	\$21.53	\$0.00	\$78.25
8	90	\$52.61	\$9.95	\$22.74	\$0.00	\$85.30
Notes:						·
	Steps are 750 hrs.					
Appre	ntice to Journeyworker Ratio:1	 :1				
R (SPRAY OR	SANDBLAST, NEW) *	01/01/2025	5 \$49.3	36 \$9.95	\$23.95	\$0.00 \$83.26

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

* If 30% or more e pa NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New

Effecti	ve Date -	01/01/2025				Supplemental	
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	50		\$24.68	\$9.95	\$0.00	\$0.00	\$34.63
2	55		\$27.15	\$9.95	\$6.66	\$0.00	\$43.76
3	60		\$29.62	\$9.95	\$7.26	\$0.00	\$46.83
4	65		\$32.08	\$9.95	\$7.87	\$0.00	\$49.90
5	70		\$34.55	\$9.95	\$20.32	\$0.00	\$64.82
6	75		\$37.02	\$9.95	\$20.93	\$0.00	\$67.90
7	80		\$39.49	\$9.95	\$21.53	\$0.00	\$70.97
8	90		\$44.42	\$9.95	\$22.74	\$0.00	\$77.11
Notes:							
	Steps are	750 hrs.					

Apprentice to Journeyworker Ratio:1:1

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2025	\$47.42	\$9.95	\$23.95	\$0.00	\$81.32

	Enecu	ve Date - 01/01/2025					
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
	1	50	\$23.71	\$9.95	\$0.00	\$0.00	\$33.66
	2	55	\$26.08	\$9.95	\$6.66	\$0.00	\$42.69
	3	60	\$28.45	\$9.95	\$7.26	\$0.00	\$45.66
	4	65	\$30.82	\$9.95	\$7.87	\$0.00	\$48.64
	5	70	\$33.19	\$9.95	\$20.32	\$0.00	\$63.46
	6	75	\$35.57	\$9.95	\$20.93	\$0.00	\$66.45
	7	80	\$37.94	\$9.95	\$21.53	\$0.00	\$69.42
	8	90	\$42.68	\$9.95	\$22.74	\$0.00	\$75.37
	Notes:						- — — — I
		Steps are 750 hrs.					
	Appre	ntice to Journeyworker Ratio:1:1					
PAINTER / TA	PER (BF	RUSH, NEW) *	01/01/202:	5 \$47	.96 \$9.95	\$23.95	\$0.00 \$81.86
* If 30% or more	If 30% or more of surfaces to be painted are new construction,		1,				
NEW paint rate	shall be	used.PAINTERS LOCAL 35 - ZONE 2					

Apprentice -	PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint
Fff	01/01/2025

Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW

]	Effecti	ve Date - 01/01/2025				Supplemental	
:	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
-	1	50	\$23.98	\$9.95	\$0.00	\$0.00	\$33.93
	2	55	\$26.38	\$9.95	\$6.66	\$0.00	\$42.99
	3	60	\$28.78	\$9.95	\$7.26	\$0.00	\$45.99
	4	65	\$31.17	\$9.95	\$7.87	\$0.00	\$48.99
	5	70	\$33.57	\$9.95	\$20.32	\$0.00	\$63.84
	6	75	\$35.97	\$9.95	\$20.93	\$0.00	\$66.85
	7	80	\$38.37	\$9.95	\$21.53	\$0.00	\$69.85
	8	90	\$43.16	\$9.95	\$22.74	\$0.00	\$75.85
-	Notes:						
		Steps are 750 hrs.					
L.	Appre	ntice to Journeyworker Ratio:1:1					`
PAINTER / TAPI PAINTERS LOCAL 35	ER (BF 5 - ZONE	RUSH, REPAINT)	01/01/202	5 \$46.0	2 \$9.95	\$23.95	\$0.00 \$79.92

	Effect	ive Date - 01/01/2025					Supplemental	ıl		
	Step	percent	A	pprentice Base Wage	Health	Pension	Unemployment	То	tal Rate	
	1	50		\$23.01	\$9.95	\$0.00	\$0.00		\$32.96	
	2	55		\$25.31	\$9.95	\$6.66	\$0.00		\$41.92	
	3	60		\$27.61	\$9.95	\$7.26	\$0.00		\$44.82	
	4	65		\$29.91	\$9.95	\$7.87	\$0.00		\$47.73	
	5	70		\$32.21	\$9.95	\$20.32	\$0.00		\$62.48	
	6	75		\$34.52	\$9.95	\$20.93	\$0.00		\$65.40	
	7	80		\$36.82	\$9.95	\$21.53	\$0.00		\$68.30	
	8	90		\$41.42	\$9.95	\$22.74	\$0.00		\$74.11	
	Notes:									
		Steps are 750 hrs.								
	Appre	entice to Journeyworker I	Ratio:1:1							
PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)		GHWAY)	12/01/2024	4 \$38.95	5 \$9.90	\$18.46	\$0.00	\$6	57.31	
LABORERS - ZON	E 2 (HEAV	Y & HIGHWAY)		06/01/2025	5 \$40.34	\$9.90	\$18.46	\$0.00	\$6	58.70
				12/01/2025	5 \$41.72	\$9.90	\$18.46	\$0.00	\$7	70.08
				06/01/2020	5 \$43.16	5 \$9.90	\$18.46	\$0.00	\$7	71.52
				12/01/2020	5 \$44.60	\$9.90	\$18.46	\$0.00	\$7	72.96
For apprentice	e rates see	"Apprentice- LABORER (Heavy	and Highway)							
PANEL & PIC	KUP TR	UCKS DRIVER		01/01/2025	5 \$39.78	\$15.57	\$20.17	\$0.00	\$7	75.52
IEAMSIEKS JOIN	I COUNC	IL NO. 10 ZONE B		06/01/2025	5 \$40.78	\$15.57	\$20.17	\$0.00	\$7	76.52
				12/01/2025	5 \$40.78	\$15.57	\$21.78	\$0.00	\$7	78.13
				01/01/2020	5 \$40.78	\$16.17	\$21.78	\$0.00	\$7	78.73
				06/01/2020	5 \$41.78	\$16.17	\$21.78	\$0.00	\$7	79.73
				12/01/2020	5 \$41.78	\$16.17	\$23.52	\$0.00	\$8	31.47
				01/01/2027	7 \$41.78	\$16.77	\$23.52	\$0.00	\$8	32.07
PIER AND DO DECK) PILE DRIVER LOO	OCK CO	NSTRUCTOR (UNDERP	INNING AND	08/01/2024	4 \$55.79	9 \$10.08	\$24.29	\$0.00	\$9	90.16
PILE DRIVER		Appleador- I IEE DATVER		08/01/2024	\$55.79	9 \$10.08	\$24.29	\$0.00	\$9	0.16

Apprentice -	PAINTER Local 35 Zone 2 - BRUSH REPAINT
Fff	01/01/2025

PILE DRIVER LOCAL 56 (ZONE 1)

Appre	Apprende - The bidy by boom of bone T									
Effect	ive Date - 08/01/2024									
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate				
1	45	\$25.11	\$10.08	\$2.53	\$0.00	\$37.72				
2	55	\$30.68	\$10.08	\$5.07	\$0.00	\$45.83				
3	70	\$39.05	\$10.08	\$19.22	\$0.00	\$68.35				
4	80	\$44.63	\$10.08	\$21.76	\$0.00	\$76.47				
Notes:	 % Indentured BEFORI	E 8/1/20; 50/60/70/75/80/80/90/90								
Appre	enfitærtð SburndyzvSøker	4 Ka\$73:113/ 4 \$76.21/ 5&6 \$79.00/ 7&8	\$84.58							
PIPEFITTER & STEAN PIPEFITTERS LOCAL 537 (L	MFITTER Local 138)	03/01/2025	\$68.88	\$12.70	\$21.80	\$0.00	\$103.38			

PILE DRIVER - Local 56 Zone 1 Annrentice

Apprentice - PIPEFITTER Local 537 (Local 138)

	Effect	ive Date - 03/0	1/2025			Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total	l Rate
	1	40	\$27.55	\$12.70	\$9.05	\$0.00	\$-	49.30
	2	45	\$31.00	\$12.70	\$21.80	\$0.00	\$	65.50
	3	60	\$41.33	\$12.70	\$21.80	\$0.00	\$	75.83
	4	70	\$48.22	\$12.70	\$21.80	\$0.00	\$	82.72
	5	80	\$55.10	\$12.70	\$21.80	\$0.00	\$	89.60
	Notes							
	Ì	** 1:3; 3:15; 1: Refrig/AC Mec	10 thereafter / Steps are 1 yr. hanic **1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:1	7;9:20;10:23	(Max)			
	Appre	entice to Journey	worker Ratio:**					
PIPELAYER			12/01/2024	4 \$39.2	0 \$9.90	\$18.36	\$0.00	\$67.46
LABORERS - ZONE 2	06/01/202	5 \$40.5	9 \$9.90	\$18.36	\$0.00	\$68.85		
			12/01/202	5 \$41.9	7 \$9.90	\$18.36	\$0.00	\$70.23
			06/01/2020	5 \$43.4	1 \$9.90	\$18.36	\$0.00	\$71.67
			12/01/2020	5 \$44.8	5 \$9.90	\$18.36	\$0.00	\$73.11
			06/01/202	7 \$46.3	0 \$9.90	\$18.36	\$0.00	\$74.56
			12/01/202	7 \$47.7	5 \$9.90	\$18.36	\$0.00	\$76.01
			06/01/2023	8 \$49.2	5 \$9.90	\$18.36	\$0.00	\$77.51
			12/01/202	8 \$50.7	5 \$9.90	\$18.36	\$0.00	\$79.01
For apprentice	rates see	"Apprentice- LABOR	ER"					
PIPELAYER (H	HEAVY f 2 <i>(hea</i> i	& HIGHWAY)	12/01/2024	4 \$39.2	0 \$9.90	\$18.46	\$0.00	\$67.56
LIDORLAG - LOW		1 ((110117/11)	06/01/202	5 \$40.5	9 \$9.90	\$18.46	\$0.00	\$68.95
			12/01/202	5 \$41.9	7 \$9.90	\$18.46	\$0.00	\$70.33
			06/01/2020	5 \$43.4	1 \$9.90	\$18.46	\$0.00	\$71.77
			12/01/2020	5 \$44.8	5 \$9.90	\$18.46	\$0.00	\$73.21

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PLUMBER	03/02/2025	\$69.84	\$14.32	\$20.31	\$0.00	\$104.47
PLUMBERS & GASFITTERS LOCAL 12 (Local 138)		+	+			+

	Effecti	ve Date -	03/02/2025				Supplemental	tal		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Тс	otal Rate	
	1	35		\$24.44	\$14.32	\$7.41	\$0.00		\$46.17	
	2	40		\$27.94	\$14.32	\$8.42	\$0.00		\$50.68	
	3	55		\$38.41	\$14.32	\$11.43	\$0.00		\$64.16	
	4	65		\$45.40	\$14.32	\$13.50	\$0.00		\$73.22	
	5	75		\$52.38	\$14.32	\$15.53	\$0.00		\$82.23	
	Notes:	** 1:2; 2:6 Steps are 1 Step 4 wit	; 3:10; 4:14; 5:19/Steps are l yr h lic\$69.00, Step5 with lic\$	1 yr 76.87						
	Appre	ntice to Jou	rneyworker Ratio:**							
PNEUMATIC CONTROLS (TEMP.) PIPEFITTERS LOCAL 537 (Local 138)		03/01/2025	5 \$68.88	3 \$12.70	\$21.80	\$0.00		\$103.38		
For apprentice	rates see '	Apprentice- Pl	PEFITTER" or "PLUMBER/PIPE	FITTER"						
PNEUMATIC D	RILL/7	TOOL OPER	RATOR	12/01/2024	4 \$39.70) \$9.90	\$17.54	\$0.00	5	\$67.14
LABORERS - ZONE	2			06/01/202	5 \$41.09	\$9.90	\$17.54	\$0.00	:	\$68.53
				12/01/2025	5 \$42.47	7 \$9.90	\$17.54	\$0.00	:	\$69.91
				06/01/2020	5 \$43.91	\$9.90	\$17.54	\$0.00	:	\$71.35
				12/01/2020	5 \$45.35	5 \$9.90	\$17.54	\$0.00	5	\$72.79
				06/01/2027	7 \$46.80) \$9.90	\$17.54	\$0.00	5	\$74.24
				12/01/2027	7 \$48.25	5 \$9.90	\$17.54	\$0.00	5	\$75.69
				06/01/2028	3 \$49.75	5 \$9.90	\$17.54	\$0.00	5	\$77.19
				12/01/2028	8 \$51.25	5 \$9.90	\$17.54	\$0.00	5	\$78.69
For apprentice	rates see '	'Apprentice- L.	ABORER"							
PNEUMATIC D	ORILL/	OOL OPE	RATOR (HEAVY &	12/01/2024	\$39.20) \$9.90	\$18.46	\$0.00	5	\$67.56
LABORERS - ZONE	2 (HEAV	Y & HIGHWAY	7)	06/01/2025	5 \$40.59	9 \$9.90	\$18.46	\$0.00	5	\$68.95
				12/01/2025	5 \$41.97	7 \$9.90	\$18.46	\$0.00	5	\$70.33
				06/01/2020	5 \$43.41	\$9.90	\$18.46	\$0.00	5	\$71.77
For appropriate	ratas saa '	Annrontico I	A DODED (Hoover and Highway)	12/01/2020	5 \$44.85	5 \$9.90	\$18.46	\$0.00	5	\$73.21
		STER	ADORER (Heavy and Highway)	12/01/202		- #0.00	¢10.26			ф <u>со 01</u>
LABORERS - ZONE	2	IST ER		12/01/2024	+ \$39.93	\$9.90	\$18.30	\$0.00	:	\$68.21
				12/01/2023	5 \$41.34	+ \$9.90	\$18.30 \$18.26	\$0.00 \$0.00	:	\$69.60
				12/01/202:	5 \$42.72	2 \$9.90	\$18.30 \$18.26	\$0.00	:	\$70.98
				06/01/2020	5 \$44.10	\$9.90	\$18.50	\$0.00 \$0.00		\$72.42
				12/01/2020	5 \$45.60	5 \$9.90	\$18.30 \$18.26	\$0.00		\$/3.80 \$75.21
				06/01/2027	/ \$47.05	\$9.90	\$18.30 \$18.20	\$0.00		\$/3.31 #76.76
				12/01/2027	/ \$48.50	\$9.90	\$18.36	\$0.00		\$76.76
				06/01/2028	\$ \$50.00	\$9.90	\$18.36	\$0.00		\$78.26
For apprentice	rates see '	Apprentice- L	ABORER"	12/01/2028	\$\$\$1.50	\$9.90	\$18.36	\$0.00	5	\$79.76

Apprentice - PLUMBER/GASFITTER - Local 12 (Local 138)

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER (HEAVY & HIGHWAY)	12/01/2024	\$39.95	\$9.65	\$18.46	\$0.00	\$68.06
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	06/01/2025	\$41.34	\$9.65	\$18.46	\$0.00	\$69.45
	12/01/2025	\$42.72	\$9.65	\$18.46	\$0.00	\$70.83
	06/01/2026	\$44.16	\$9.65	\$18.46	\$0.00	\$72.27
	12/01/2026	\$45.60	\$9.65	\$18.46	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWER SHOVEL/DERRICK/TRENCHING MACHINE	12/01/2024	\$57.03	\$15.55	\$16.50	\$0.00	\$89.08
OF ERATING ENGINEERS EUCAL 4	06/01/2025	\$58.33	\$15.55	\$16.50	\$0.00	\$90.38
	12/01/2025	\$59.78	\$15.55	\$16.50	\$0.00	\$91.83
	06/01/2026	\$61.08	\$15.55	\$16.50	\$0.00	\$93.13
	12/01/2026	\$62.53	\$15.55	\$16.50	\$0.00	\$94.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) OPERATING ENGINEERS LOCAL 4	12/01/2024	\$56.40	\$15.55	\$16.50	\$0.00	\$88.45
	06/01/2025	\$57.68	\$15.55	\$16.50	\$0.00	\$89.73
	12/01/2025	\$59.12	\$15.55	\$16.50	\$0.00	\$91.17
	06/01/2026	\$60.40	\$15.55	\$16.50	\$0.00	\$92.45
	12/01/2026	\$61.84	\$15.55	\$16.50	\$0.00	\$93.89
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OPERATING ENGINEERS LOCAL 4	12/01/2024	\$36.67	\$15.55	\$16.50	\$0.00	\$68.72
	06/01/2025	\$37.52	\$15.55	\$16.50	\$0.00	\$69.57
	12/01/2025	\$38.47	\$15.55	\$16.50	\$0.00	\$70.52
	06/01/2026	\$39.33	\$15.55	\$16.50	\$0.00	\$71.38
For apprentice rates see "Apprentice, OPED ATIME ENCINEEDS"	12/01/2026	\$40.28	\$15.55	\$16.50	\$0.00	\$72.33
PEADV MIX CONCRETE DRIVER	0.1.10.1.10.0.0.7	**		ф <i>с</i> 55	<u></u>	.
TEAMSTERS 170 - J.G. MacLellan (Lowell)	01/01/2025	\$30.00	\$11.57	\$6.55	\$0.00	\$48.12
	05/01/2025	\$30.50	\$11.57	\$6.65	\$0.00	\$48.72
	01/01/2026	\$30.50	\$11.97	\$6.65	\$0.00	\$49.12
OPERATING ENGINEERS LOCAL 4	12/01/2024	\$56.40	\$15.55	\$16.50	\$0.00	\$88.45
	06/01/2025	\$57.68	\$15.55	\$16.50	\$0.00	\$89.73
	12/01/2025	\$59.12	\$15.55	\$16.50	\$0.00	\$91.17
	06/01/2026	\$60.40	\$15.55	\$16.50	\$0.00	\$92.45
For apprentice rates see "Apprentice, OPED ATIME ENCINEEDS"	12/01/2026	\$61.84	\$15.55	\$16.50	\$0.00	\$93.89
		*** **	** **	¢10.24	<u></u>	
LABORERS - ZONE 2	12/01/2024	\$39.20	\$9.90	\$18.36	\$0.00	\$67.46
	06/01/2025	\$40.59	\$9.90	\$18.36	\$0.00	\$68.85
	12/01/2025	\$41.97	\$9.90	\$18.36	\$0.00	\$70.23
	06/01/2026	\$43.41	\$9.90	\$18.36	\$0.00	\$71.67
	12/01/2026	\$44.85	\$9.90	\$18.36	\$0.00	\$73.11
	06/01/2027	\$46.30	\$9.90	\$18.36	\$0.00	\$74.56
	12/01/2027	\$47.75	\$9.90	\$18.36	\$0.00	\$76.01
	06/01/2028	\$49.25	\$9.90	\$18.36	\$0.00	\$77.51
	12/01/2028	\$50.75	\$9.90	\$18.36	\$0.00	\$79.01

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ROLLER/SPREADER/MULCHING MACHINE	12/01/2024	\$56.40	\$15.55	\$16.50	\$0.00	\$88.45
OPERAIING ENGINEERS LOCAL 4	06/01/2025	\$57.68	\$15.55	\$16.50	\$0.00	\$89.73
	12/01/2025	\$59.12	\$15.55	\$16.50	\$0.00	\$91.17
	06/01/2026	\$60.40	\$15.55	\$16.50	\$0.00	\$92.45
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2026	\$61.84	\$15.55	\$16.50	\$0.00	\$93.89
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg)	02/01/2025	\$52.03	\$13.28	\$21.70	\$0.00	\$87.01
ROOFERS LOCAL 33	08/01/2025	\$53.53	\$13.28	\$21.70	\$0.00	\$88.51
	02/01/2026	\$54.78	\$13.28	\$21.70	\$0.00	\$89.76

	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	:
	1	50	\$26.02	\$13.28	\$15.55	\$0.00	\$54.85	
	2	60	\$31.22	\$13.28	\$21.70	\$0.00	\$66.20	
	3	65	\$33.82	\$13.28	\$21.70	\$0.00	\$68.80	
	4	75	\$39.02	\$13.28	\$21.70	\$0.00	\$74.00	
	5	85	\$44.23	\$13.28	\$21.70	\$0.00	\$79.21	
	Effect	ive Date - 08/01/2025				Supplemental		
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
	1	50	\$26.77	\$13.28	\$15.55	\$0.00	\$55.60	
	2	60	\$32.12	\$13.28	\$21.70	\$0.00	\$67.10	
	3	65	\$34.79	\$13.28	\$21.70	\$0.00	\$69.77	
	4	75	\$40.15	\$13.28	\$21.70	\$0.00	\$75.13	
	5	85	\$45.50	\$13.28	\$21.70	\$0.00	\$80.48	
	Notes:	** 1:5, 2:6-10, the 1:10; F Step 1 is 2000 hrs.; Steps (Hot Pitch Mechanics' re	Reroofing: 1:4, then 1:1 2-5 are 1000 hrs. ceive \$1.00 hr. above ROOFER)				 	
	Appre	entice to Journeyworker R	atio:**					
ROOFER SLA	TE / TIL	E / PRECAST CONCRET	E 02/01/2025	5 \$52.28	\$13.28	\$21.70	\$0.00	\$87.26
ROOFERS LOCAL	. 33		08/01/2025	\$53.78	\$13.28	\$21.70	\$0.00	\$88.76
			02/01/2020	\$55.03	\$13.28	\$21.70	\$0.00	\$90.01
For apprentice	e rates see	"Apprentice- ROOFER"						
SHEETMETAL	L WORK	XER	02/01/2025	\$59.13	\$14.91	\$28.27	\$2.98	\$105.29
SHEETMETAL WC	ΜΑΕΚΟ Ε	JCAL 1 / - A	08/01/2025	\$60.98	\$14.91	\$28.27	\$2.98	\$107.14
			02/01/2020	\$62.93	\$14.91	\$28.27	\$2.98	\$109.09

Supplemental

Apprentice - ROOFER - Local 33

Effective Date - 02/01/2025

Issue Date: 04/18/2025
Effecti	ve Date -	02/01/2025						
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	
1	42		\$24.83	\$14.91	\$6.13	\$0.00	\$45.87	
2	42		\$24.83	\$14.91	\$6.13	\$0.00	\$45.87	
3	47		\$27.79	\$14.91	\$12.26	\$1.62	\$56.58	
4	47		\$27.79	\$14.91	\$12.26	\$1.62	\$56.58	
5	52		\$30.75	\$14.91	\$13.24	\$1.74	\$60.64	
6	52		\$30.75	\$14.91	\$13.49	\$1.75	\$60.90	
7	60		\$35.48	\$14.91	\$14.90	\$1.93	\$67.22	
8	65		\$38.43	\$14.91	\$15.88	\$2.04	\$71.26	
9	75		\$44.35	\$14.91	\$17.84	\$2.28	\$79.38	
10	85		\$50.26	\$14.91	\$19.30	\$2.49	\$86.96	

Apprentice - SHEET METAL WORKER - Local 17-A

			ψT1.55	ψ1 1.9 1	φ17.01	φ2.20	Ψ7.	2.50
	10	85	\$50.26	\$14.91	\$19.30	\$2.49	\$80	6.96
	Effecti	ive Date - 08/01/2025	Ammentics Dass Wass	Haalth	Dansian	Supplemental	Tatall	Data
		percent	Apprentice base wage	пеани	Pension	Onemployment	10181 1	Kale
	I	42	\$25.61	\$14.91	\$6.13	\$0.00	\$40	6.65
	2	42	\$25.61	\$14.91	\$6.13	\$0.00	\$40	6.65
	3	47	\$28.66	\$14.91	\$12.26	\$1.62	\$57	7.45
	4	47	\$28.66	\$14.91	\$12.26	\$1.62	\$57	7.45
	5	52	\$31.71	\$14.91	\$13.24	\$1.74	\$6	1.60
	6	52	\$31.71	\$14.91	\$13.49	\$1.75	\$6	1.86
	7	60	\$36.59	\$14.91	\$14.90	\$1.93	\$63	8.33
	8	65	\$39.64	\$14.91	\$15.88	\$2.04	\$72	2.47
	9	75	\$45.74	\$14.91	\$17.84	\$2.28	\$80	0.77
	10	85	\$51.83	\$14.91	\$19.30	\$2.49	\$88	8.53
	Notes:							_
		Steps are 6 mos.						
	Appre	ntice to Journeyworker Ratio:1:4						
SPECIALIZED	EARTH	H MOVING EQUIP < 35 TONS	01/01/2025	5 \$40.24	\$15.57	\$20.17	\$0.00	\$75.98
IEAMSIEKS JOIN	I COUNC	IL NO. 10 ZONE B	06/01/2025	5 \$41.24	\$15.57	\$20.17	\$0.00	\$76.98
			12/01/2025	5 \$41.24	\$15.57	\$21.78	\$0.00	\$78.59
			01/01/2020	5 \$41.24	\$16.17	\$21.78	\$0.00	\$79.19
			06/01/2020	5 \$42.24	\$16.17	\$21.78	\$0.00	\$80.19
			12/01/2020	5 \$42.24	\$16.17	\$23.52	\$0.00	\$81.93

01/01/2027

\$42.24

\$82.53

\$23.52

\$16.77

\$0.00

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS	01/01/2025	\$40.53	\$15.57	\$20.17	\$0.00	\$76.27
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2025	\$41.53	\$15.57	\$20.17	\$0.00	\$77.27
	12/01/2025	\$41.53	\$15.57	\$21.78	\$0.00	\$78.88
	01/01/2026	\$41.53	\$16.17	\$21.78	\$0.00	\$79.48
	06/01/2026	\$42.53	\$16.17	\$21.78	\$0.00	\$80.48
	12/01/2026	\$42.53	\$16.17	\$23.52	\$0.00	\$82.22
	01/01/2027	\$42.53	\$16.77	\$23.52	\$0.00	\$82.82
SPRINKLER FITTER SPRINKLER FITTERS LOCAL 550 - (Section B) Zone 2	03/01/2025	\$64.93	\$11.51	\$23.80	\$0.00	\$100.24

	Effect	ive Date - 03/01/2025		Supplement				
	Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate	3
	1	35	\$22.73	\$11.51	\$13.07	\$0.00	\$47.31	l
	2	40	\$25.97	\$11.51	\$13.90	\$0.00	\$51.38	3
	3	45	\$29.22	\$11.51	\$14.72	\$0.00	\$55.45	;
	4	50	\$32.47	\$11.51	\$15.55	\$0.00	\$59.53	3
	5	55	\$35.71	\$11.51	\$16.38	\$0.00	\$63.60)
	6	60	\$38.96	\$11.51	\$17.20	\$0.00	\$67.67	7
	7	65	\$42.20	\$11.51	\$18.03	\$0.00	\$71.74	ŧ
	8	70	\$45.45	\$11.51	\$18.85	\$0.00	\$75.81	l
	9	75	\$48.70	\$11.51	\$19.68	\$0.00	\$79.89)
	10	80	\$51.94	\$11.51	\$20.50	\$0.00	\$83.95	5
	Notes:	Apprentice entered prior 9/30/10: 40/45/50/55/60/65/70/75/80/85 Steps are 850 hours					 	
	Appre	entice to Journeyworker Ratio:1:3						
STEAM BOILE	ER OPE	RATOR	12/01/2024	4 \$56.40	\$15.55	\$16.50	\$0.00	\$88.45
OPERATING ENGI	NEERS L	OCAL 4	06/01/2023	5 \$57.68	\$15.55	\$16.50	\$0.00	\$89.73
			12/01/202	5 \$59.12	\$15.55	\$16.50	\$0.00	\$91.17
			06/01/2020	6 \$60.40	\$15.55	\$16.50	\$0.00	\$92.45
			12/01/2020	6 \$61.84	\$15.55	\$16.50	\$0.00	\$93.89
For apprentice	rates see	"Apprentice- OPERATING ENGINEERS"						
TAMPERS, SE	LF-PRC	PELLED OR TRACTOR DRAWN	12/01/2024	4 \$56.40	\$15.55	\$16.50	\$0.00	\$88.45
OI ERAIINO ENOI	TEENS L	UCAL T	06/01/202	5 \$57.68	\$15.55	\$16.50	\$0.00	\$89.73
			12/01/2023	5 \$59.12	\$15.55	\$16.50	\$0.00	\$91.17
			06/01/2020	6 \$60.40	\$15.55	\$16.50	\$0.00	\$92.45
			12/01/2020	6 \$61.84	\$15.55	\$16.50	\$0.00	\$93.89

Apprentice - SPRINKLER FITTER - Local 550 (Section B) Zone 2

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TELECOMMUNICATION TECHNICIAN	03/01/2025	\$51.41	\$13.00	\$20.90	\$0.00	\$85.31
ELECTRICIANS LOCAL 103	09/01/2025	\$52.94	\$13.00	\$20.95	\$0.00	\$86.89
	03/01/2026	\$53.90	\$13.00	\$20.98	\$0.00	\$87.88
	09/01/2026	\$55.42	\$13.00	\$21.02	\$0.00	\$89.44
	03/01/2027	\$56.38	\$13.00	\$21.05	\$0.00	\$90.43
	09/01/2027	\$57.91	\$13.00	\$21.10	\$0.00	\$92.01
	03/01/2028	\$58.87	\$13.00	\$21.13	\$0.00	\$93.00

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103

Effectiv	ve Date - 03/01/2025				Supplemental	
Step	percent	Apprentice Base Wage	Health	Pension	Unemployment	Total Rate
1	45	\$23.13	\$13.00	\$0.69	\$0.00	\$36.82
2	45	\$23.13	\$13.00	\$0.69	\$0.00	\$36.82
3	50	\$25.71	\$13.00	\$16.64	\$0.00	\$55.35
4	50	\$25.71	\$13.00	\$16.64	\$0.00	\$55.35
5	55	\$28.28	\$13.00	\$17.07	\$0.00	\$58.35
6	60	\$30.85	\$13.00	\$17.50	\$0.00	\$61.35
7	65	\$33.42	\$13.00	\$17.92	\$0.00	\$64.34
8	70	\$35.99	\$13.00	\$18.35	\$0.00	\$67.34
9	75	\$38.56	\$13.00	\$18.78	\$0.00	\$70.34
10	80	\$41.13	\$13.00	\$19.19	\$0.00	\$73.32

Effec	ctive Date -	09/01/2025				Supplemental		
Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	То	tal Rate
1	45		\$23.82	\$13.00	\$0.71	\$0.00		\$37.53
2	45		\$23.82	\$13.00	\$0.71	\$0.00		\$37.53
3	50		\$26.47	\$13.00	\$16.66	\$0.00		\$56.13
4	50		\$26.47	\$13.00	\$16.66	\$0.00		\$56.13
5	55		\$29.12	\$13.00	\$17.09	\$0.00		\$59.21
6	60		\$31.76	\$13.00	\$17.52	\$0.00		\$62.28
7	65		\$34.41	\$13.00	\$17.95	\$0.00		\$65.36
8	70		\$37.06	\$13.00	\$18.38	\$0.00		\$68.44
9	75		\$39.71	\$13.00	\$18.81	\$0.00		\$71.52
10	80		\$42.35	\$13.00	\$19.23	\$0.00		\$74.58
Note								
ĺ								
Арри	rentice to Jou	ırneyworker Ratio:1:1						
TERRAZZO FINISHI	ERS		02/01/2023	5 \$64.74	\$11.49	\$23.59	\$0.00	\$99.82
BRICKLAYERS LOCAL 3	3RICKLAYERS LOCAL 3 - MARBLE & TILE		08/01/2023	5 \$66.89	\$11.49	\$23.59	\$0.00	\$101.97
			02/01/2020	5 \$68.24	\$11.49	\$23.59	\$0.00	\$103.32
			08/01/2020	5 \$70.44	\$11.49	\$23.59	\$0.00	\$105.52
			02/01/202	7 \$71.84	\$11.49	\$23.59	\$0.00	\$106.92

Effective Date - 02/01/2025		02/01/2025			Supplemental		ıl		
	Step	percent		Apprentice Base Wage	Health	Pension	Unemployment	Total Rat	te
	1	50		\$32.37	\$11.49	\$23.59	\$0.00	\$67.4	45
	2	60		\$38.84	\$11.49	\$23.59	\$0.00	\$73.9	92
	3	70		\$45.32	\$11.49	\$23.59	\$0.00	\$80.4	40
	4	80		\$51.79	\$11.49	\$23.59	\$0.00	\$86.8	37
	5	90		\$58.27	\$11.49	\$23.59	\$0.00	\$93.3	35
	Effecti	ive Date -	08/01/2025				Symplomental		
	Step	percent		Apprentice Base Wage	Apprentice Base Wage Health		SupplementalPensionUnemployment		te
	1	50		\$33.45	\$11.49	\$23.59	\$0.00	\$68.5	53
	2	60		\$40.13	\$11.49	\$23.59	\$0.00	\$75.2	21
	3	70		\$46.82	\$11.49	\$23.59	\$0.00	\$81.9	90
	4	80		\$53.51	\$11.49	\$23.59	\$0.00	\$88.5	59
	5	90		\$60.20	\$11.49	\$23.59	\$0.00	\$95.2	28
	Notes:								- -
	Appre	ntice to Jo	urneyworker Ratio:1:3						
TEST BORING	DRILL	ER		12/01/2024	1 \$50.20	\$9.90	\$19.05	\$0.00	\$79.15
LABORERS - FOU	LABORERS - FOUNDATION AND MARINE		Ε	06/01/202	5 \$51.20	\$9.90	\$19.05	\$0.00	\$80.65
				12/01/202	5 \$53.20	\$9.90	\$19.05	\$0.00	\$82.15
				06/01/2020	5 \$54.75	\$9.90	\$19.05	\$0.00	\$83.70
				12/01/2020	5 \$56.25	\$9.90	\$19.05	\$0.00	\$85.20
For apprentice	rates see '	'Apprentice- I	LABORER"			* · · · · ·		• • • •	+ • • • - •
TEST BORING) DRILL	ER HELP	ER	12/01/2024	4 \$46.32	\$9.90	\$19.05	\$0.00	\$75.27
LABORERS - FOUL	NDATION	AND MARIN	E	06/01/202	5 \$47.82	\$9.90	\$19.05	\$0.00	\$76.77
				12/01/202	5 \$49.32	\$9.90	\$19.05	\$0.00	\$78.27
				06/01/2020	5 \$50.87	\$9.90	\$19.05	\$0.00	\$79.82
For appropriate	rates see !	'Annrontiao I	ADODED"	12/01/2020	5 \$52.37	\$9.90	\$19.05	\$0.00	\$81.32
TEST BORING	b LABO	RER		12/01/2024	4 \$46.20	\$9 90	\$19.05	\$0.00	\$75.15
LABORERS - FOUR	NDATION	AND MARIN	Ε	06/01/202	5 \$47.70	\$9.90	\$19.05	\$0.00	\$76.65
				12/01/202:	5 \$49.20	\$9.90	\$19.05	\$0.00	\$78.15
				06/01/2020	5 \$50.75	\$9.90	\$19.05	\$0.00	\$79.70
				12/01/2020	5 \$52.25	\$9.90	\$19.05	\$0.00	\$81.20
For apprentice	rates see '	'Apprentice- I	LABORER"						
TRACTORS/PC	ORTABI	LE STEAN	I GENERATORS	12/01/2024	\$56.40	\$15.55	\$16.50	\$0.00	\$88.45
OPERATING ENGI	NEERS LO	JCAL 4		06/01/202:	5 \$57.68	\$15.55	\$16.50	\$0.00	\$89.73
				12/01/202	5 \$59.12	\$15.55	\$16.50	\$0.00	\$91.17
				06/01/2020	5 \$60.40	\$15.55	\$16.50	\$0.00	\$92.45
				12/01/2020	5 \$61.84	\$15.55	\$16.50	\$0.00	\$93.89
For apprentice	rates see '	'Apprentice- (OPERATING ENGINEERS"						

Apprentice -	TERRAZZO FINISHER - Local 3 Marble & Tile
Effective Date	02/01/2025

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TRAILERS FOR EARTH MOVING EQUIPMENT	01/01/2025	\$40.82	\$15.57	\$20.17	\$0.00	\$76.56
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	06/01/2025	\$41.82	\$15.57	\$20.17	\$0.00	\$77.56
	12/01/2025	\$41.82	\$15.57	\$21.78	\$0.00	\$79.17
	01/01/2026	\$41.82	\$16.17	\$21.78	\$0.00	\$79.77
	06/01/2026	\$42.82	\$16.17	\$21.78	\$0.00	\$80.77
	12/01/2026	\$42.82	\$16.17	\$23.52	\$0.00	\$82.51
	01/01/2027	\$42.82	\$16.77	\$23.52	\$0.00	\$83.11
TUNNEL WORK - COMPRESSED AIR	12/01/2024	\$58.43	\$9.90	\$19.50	\$0.00	\$87.83
LABORERS (COMPRESSED AIR)	06/01/2025	\$59.93	\$9.90	\$19.50	\$0.00	\$89.33
	12/01/2025	\$61.43	\$9.90	\$19.50	\$0.00	\$90.83
	06/01/2026	\$62.98	\$9.90	\$19.50	\$0.00	\$92.38
	12/01/2026	\$64.48	\$9.90	\$19.50	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE)	12/01/2024	\$60.43	\$9.90	\$19.50	\$0.00	\$89.83
	06/01/2025	\$61.93	\$9.90	\$19.50	\$0.00	\$91.33
	12/01/2025	\$63.43	\$9.90	\$19.50	\$0.00	\$92.83
	06/01/2026	\$64.98	\$9.90	\$19.50	\$0.00	\$94.38
For apprentice rates see "Apprentice- LABORER"	12/01/2026	\$66.48	\$9.90	\$19.50	\$0.00	\$95.88
TUNNEL WORK - FREE AIR	12/01/2024	\$50.50	\$9.90	\$19.50	\$0.00	\$79.90
LABORERS (FREE AIR TUNNEL)	06/01/2025	\$52.00	\$9.90	\$19.50	\$0.00	\$81.40
	12/01/2025	\$53.50	\$9.90	\$19.50	\$0.00	\$82.90
	06/01/2026	\$55.05	\$9.90	\$19.50	\$0.00	\$84.45
	12/01/2026	\$56.55	\$9.90	\$19.50	\$0.00	\$85.95
For apprentice rates see "Apprentice- LABORER"			*			
TUNNEL WORK - FREE AIR (HAZ. WASTE)	12/01/2024	\$52.50	\$9.90	\$19.50	\$0.00	\$81.90
LABORERS (FREE AIR TUNNEL)	06/01/2025	\$54.00	\$9.90	\$19.50	\$0.00	\$83.40
	12/01/2025	\$55.50	\$9.90	\$19.50	\$0.00	\$84.90
	06/01/2026	\$57.05	\$9.90	\$19.50	\$0.00	\$86.45
	12/01/2026	\$58.55	\$9.90	\$19.50	\$0.00	\$87.95
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	01/01/2025	\$40.24	\$15.57	\$20.17	\$0.00	\$75.98
TEMBLERS JOINT COONCEL NO. TO LONE D	06/01/2025	\$41.24	\$15.57	\$20.17	\$0.00	\$76.98
	12/01/2025	\$41.24	\$15.57	\$21.78	\$0.00	\$78.59
	01/01/2026	\$41.24	\$16.17	\$21.78	\$0.00	\$79.19
	06/01/2026	\$42.24	\$16.17	\$21.78	\$0.00	\$80.19
	12/01/2026	\$42.24	\$16.17	\$23.52	\$0.00	\$81.93
	01/01/2027	\$42.24	\$16.77	\$23.52	\$0.00	\$82.53

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WAGON DRILL OPERATOR	12/01/2024	\$40.61	\$9.65	\$17.70	\$0.00	\$67.96
LABORERS - ZONE 2	06/01/2025	\$42.00	\$9.65	\$17.70	\$0.00	\$69.35
	12/01/2025	\$43.38	\$9.65	\$17.70	\$0.00	\$70.73
	06/01/2026	\$44.82	\$9.65	\$17.70	\$0.00	\$72.17
	12/01/2026	\$46.26	\$9.65	\$17.70	\$0.00	\$73.61
	06/01/2027	\$47.71	\$9.65	\$17.70	\$0.00	\$75.06
	12/01/2027	\$49.16	\$9.65	\$17.70	\$0.00	\$76.51
	06/01/2028	\$50.66	\$9.65	\$17.70	\$0.00	\$78.01
	12/01/2028	\$52.16	\$9.65	\$17.70	\$0.00	\$79.51
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY)	12/01/2024	\$39.20	\$9.90	\$18.46	\$0.00	\$67.56
LABOKEK5 - ZONE 2 (HEAV I & HIGHWAI)	06/01/2025	\$40.59	\$9.90	\$18.46	\$0.00	\$68.95
	12/01/2025	\$41.97	\$9.90	\$18.46	\$0.00	\$70.33
	06/01/2026	\$43.41	\$9.90	\$18.46	\$0.00	\$71.77
	12/01/2026	\$44.85	\$9.90	\$18.46	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
WASTE WATER PUMP OPERATOR	12/01/2024	\$57.03	\$15.55	\$16.50	\$0.00	\$89.08
OPERATING ENGINEERS LOCAL 4	06/01/2025	\$58.33	\$15.55	\$16.50	\$0.00	\$90.38
	12/01/2025	\$59.78	\$15.55	\$16.50	\$0.00	\$91.83
	06/01/2026	\$61.08	\$15.55	\$16.50	\$0.00	\$93.13
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2026	\$62.53	\$15.55	\$16.50	\$0.00	\$94.58
WATER METER INSTALLER PLUMBERS & GASFITTERS LOCAL 12 (Local 138)	03/02/2025	\$69.84	\$14.32	\$20.31	\$0.00	\$104.47
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/	GASFITTER"					

Additional Apprentice Information:

All apprentices must be registered with the Division of Apprenticeship Training (DAS) in accordance with M.G.L. c. 23, §§ 11E-11L. Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the hourly prevailing wage rate established by the Commissioner under the provisions of M.G.L. c. 149, §§ 26-27D. Apprentice ratios are established by DAS pursuant to M.G.L. c. 23, §§ 11E-11L. Ratios are expressed as the allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified. The ratios listed herein have been taken from relevant private collective bargaining agreements (CBAs) and are provided for illustrative purposes only. They have not been independently verified as being accurate or continuing to be accurate. Parties having questions regarding what ratio to use should contact DAS.

Appendix B

Geotechnical Data

Boring Logs, dated October 24, 2022 Test Pit Observation Report, dated November 6, 2024 DEP Sediment Analysis Approval Chemical Analysis of Sediment Sediment Sampling Results, dated June 10, 2024 Grain Size Analysis of Sediment, dated June 7, 2024 Dredging and Disposal Operation Plan

				BORING LOG					
Project: Old North Pump Station Boat Ramp Location: North Andover, MA Client: Town of North Andover Driller: Northern Drill Service, Inc. Drilling Methods: Drive & Wash Weather: 50s, light rain Performed By: AET Date: 10/24/22 Checked By: Date:				Boring Locus Map	Location: Near Approx. Ground Approx. Ground Date/Time of G Datum: N/A Project No. NO	Boring No: entrance to boat ramp d Elevation: N/A dwater Elevation: N/A roundwater Elevation: R120-0628071-220033	B-1 N/A		
Depth (feet)	Sample No.	Pen./ Rec. (Inch)	Blow Counts per 6 inch	Soil Description		Stratum Change Depth (feet)	Note		
— 0-1.25	B-1 0 - 1.25	11 / 15	1 11 100+	0-6" Dark brown, organic soi 6-11" Medium dense, grey, POORLY GR SILT, moist, few gravel, trace organics, v	l, moist ADED SAND WITH vhite rock dust in tip	Soil Sand with Silt	1		
 	N/A	N/A	N/A	Roller bit used to through 8-foc	Boulder	2 3			
— 9-11	B-1 9 - 11	9 / 24	6 4 4 4	Medium, grey, SILT, wet, some fine sa	Silt				
11 - 14	N/A	N/A	N/A	Unknown					
— 14 - 16	B-1 14 - 16	14 / 24	51 21 30 28	Hard, grey, SANDY SILT, wet, little grave tip	el, rock fragment in	Sandy Silt			
16-19	N/A	N/A	N/A	Unknown					
— 19-21	B-1 19- 21	20 / 24	21 16 15 25	Hard, grey/light brown, SILT WITH SAN	D, wet, little gravel	Silt with Sand	4		
				END OF BORING					
<u>NOTES:</u> 1. Split spoon refusal encountered at 1.25 feet below ground surface (bgs) 2. Driller stated that boulder felt like it had a flat top and was fairly easy to drill through, indicating that it could be an old retaining wall				LEGEND Trace - Approximately <5%					
4. Boring term feet bgs	inated at p	predetermin	ned depth of 2	1 0-3 Fine Soil N Value - Very Soft 3-4 Fine 9-15 Fine Soil N Value - Stiff 16-30 Fine	5-8 Fine Soil N Value - Medium >30 Fine Soil N Value - Hard				

				BORING LUG						
Project: Olc Location: N Client: Tow	l North Pur North Andov n of North A	np Station ver, MA Andover	Boat Ramp		Location: Near	Boring No:	B-2			
Driller: Nort	hern Drill S	Service Inc		P'1	Approx Groups					
Drilling Mot	hem Dhii c			B-3 B-1	Approx. Ground					
	nous. Driv			0 ^{D-Z}	Approx. Ground		N1/A			
Dorformed	DUS, light ra	III Deter	10/04/00	The second fill a second	Date/Time of G	roundwater Elevation:	IN/A			
	Бу. АСТ	Date.	10/24/22		Datum N/A	D100 0609071 00003	202			
Checked D	y.	Dale.	1	Boring Locus Map	Project No. NO	R120-0020071-22003	502			
Depth (feet)	Sample No.	Pen./ Rec. (Inch)	Blow Counts per 6 inch	Soil Description	Stratum Change Depth (feet)	Note				
— 0-2	B-2 0 - 2	8.5 / 24	5 9 8	0-6" Dark brown, organi 6-8.5" Medium dense, light brown/da	c soil ark brown/orange	Soil				
			5	POORET GRADED SAND WITH SILT,	moist, some organics	Sand with sit				
— 2-4	N/A	N/A	N/A	Unknown	Unknown					
— 4-6	B-24-6	11 / 24	10 7 7 8	Medium dense, light brown SILTY SAN	Silty Sand	1				
6 - 9	N/A	N/A	N/A	Unknown						
— 9-11	B-2 9 - 11	4 / 24	34 53 57 55	Very dense, light brown fine POORLY G SILT, wet, rock fragment						
 11 - 14	N/A	N/A	N/A	Unknown	Unknown S					
— 14 - 16	B-2 14 - 16	14.5 / 24	4 4 6 11	Loose, light brown, POORLY GRADED wet						
 16-19	N/A	N/A	N/A	Unknown						
— 19-21	B-2 19-	17 / 24	4 6 10	0-10" Stiff, light brown, SILT WITH SA 10-17" Medium dense, light brown WE	ND, wet, laminated LL GRADED SAND	Silt with Sand, Laminated				
	21		15	WITH SILT, wet, some sma	all gravel	Sand with Silt	2			
				END OF BORING						
NOTES:				LEGEND						
1 \1/0+05+06-	magaine	hotef	thac	Trace - Approximately <5% Few	Approximately 6% to 15%					
2. Boring tern	ninated at p	a at o.5 ree predetermir	ned depth of	21 Little - Approximately 16% to 30% Some	- Approximately 31% to 49%					
feet bgs	F		•	0-4 Coarse Soil N Value - Very Loose 5-10 C	oarse Soil N Value - Loose	11-29 Coarse Soil N Value	- Medium Dense			
				30-49 Coarse Soil N Value - Dense >50 Co	oarse Soil N Value - Very Dense					
				0-3 Fine Soil N Value - Very Soft 3-4 Fir	ne Soil N Value - Soft	5-8 Fine Soil N Value - Med	dium			
				9-15 Fine Soil N Value - Stiff 16-30	Fine Soil N Value - Very Stiff	>30 Fine Soil N Value - Ha	rd			

BORING LOG

				BURING LUG					
Project: Old	l North Pun	np Station	Boat Ramp	and the second of the second s					
Location: N	lorth Andov	/er, MA		The state of the s		Boring No:	B-3		
Client: Tow	n of North A	Andover			Location: On d	ravel in between B-1 ar	 nd B-2		
Driller: Nort	hern Drill S	ervice. Inc	2	B-1	Approx Ground	d Flevation: N/A			
Drilling Met	hods: Drive	e & Wash		B=2 0 ^{B-3} 0 ^{D-1}	Approx. Ground	dwater Elevation: N/A			
Weather: 5	i0s. light rai	in		•	Date/Time of G	Froundwater Elevation:	N/A		
Performed	Bv: AET	Date:	10/24/22	and the state	Datum: N/A				
Checked By	/:	Date:		Boring Locus Map	Project No. NO	R120-0628071-220033	302		
	,				,	Christian			
Depth (feet)	Sample No.	Pen./ Rec. (Inch)	Blow Counts per 6 inch	Soil Description		Stratum Change Depth (feet)	Note		
— 0-2	B-3 0 - 2	14 / 24	8 7 8 7	Medium dense, brown lightening downv GRADED SAND, moist, little gravel, tra organics layer at 4"	vards, POORLY ace silt, with 1"	Sand			
— 2-4	N/A	N/A	N/A	Unknown					
— 4 - 6	No sample collected	2 / 24	11 10 10 8	Medium dense, light brown, SILTY SAND rock fragment in tip	, wet, little gravel,	Silty Sand	1		
6-9	N/A	N/A	N/A	Unknown					
— 9-11	B-3 9 - 11	15 / 24	17 21 20 18	Dense, light brown, POORLY GRADED SAND, wet, little silt	Gravel with Sand				
 11 - 14	N/A	N/A	N/A	Unknown	Unknown				
	D 2 14		17						
— 14 - 16	16	17 / 24	15 15 17	wet, trace gravel, sections with thin	laminations	Sand with Silt			
 16-19	N/A	N/A	N/A	Unknown					
10.21	B-3 19-	24/24	28 34	0-10" Very dense, light brown, POORLY	GRADED SAND	Sand with Gravel			
- 19-21	21	24 / 24	42 67	10-24" Hard, light brown, SILT WITH SANI), wet, trace gravel	Silt with Sand	2		
<u>NOTES:</u>				LEGEND					
1. Water table	e measured	l at 6.5 fee	t bgs	Trace - Approximately <5% Few - App	oximately 6% to 15%				
2. Boring term	ninated at p	redetermi	ned depth of 2	Little - Approximately 16% to 30% Some - Approximately 16% to 30%	proximately 31% to 49%				
feet bgs				0-4 Coarse Soil N Value - Very Loose 5-10 Coars	e Soil N Value - Loose	11-29 Coarse Soil N Value	- Medium Dense		
				30-49 Coarse Soil N Value - Dense >50 Coars	e Soil N Value - Very Dense	3			
				0-3 Fine Soil N Value - Very Soft 3-4 Fine S	oil N Value - Soft	5-8 Fine Soil N Value - Med	lium		
				10-30 FINE	Soli in value - very Still	- JUT THE JUILIN VALUE - HAI	u		



OBSERVATION REPORT

Date: November 6, 2024

- To Mr. John Borgesi, PE, Town Engineer Ms. Amy Maxner, Conservation Administrator
- **From** Drew Gallant, PE, SE Environmental Partners Jamie Veillette, EIT – Environmental Partners

SubjectNorth Lake Cochichewick Boat LaunchSoil Evaluation of Proposed Bioretention Areas #1 & #2

On Tuesday, October 22, 2024, Environmental Partner's (EP) personnel, Drew Gallant (SE #14482) and Tyler Pilch, arrived on-site at 7:45 AM to perform a soil evaluation of the proposed locations for bioretention areas #1 and #2 at the North Lake Cochichewick Boat Launch in North Andover, MA. The purpose of the site visit was to determine soil texture and estimated seasonal high groundwater (ESHGW) within the limits of the proposed bioretention areas.

EP personnel met with the North Andover Town Engineer, John Borgesi, and a North Andover DPW operator to review the soil testing procedure. Two test pits (TP-1 & TP-2) were excavated by the DPW operator. Test pit locations are shown in Figure 1 on the following page of this report.

In summary, TP-1 and TP-2 consisted of Sandy Loam at the bottom of each test pit and both had the presence of redoximorphic features, an indicator of estimated seasonal high groundwater (ESHGW). Sand was observed in the B soil horizon for TP-1 while Loamy Sand was observed in the B soil horizon for TP-2. Human transported material (HTM), or fill, was found in the uppermost soil horizon for both test pits. A complete soil evaluation for each test pit is provided on page 2 of this report.



Figure 1 – Soil Evaluations of Test Pits 1 & 2 (TP-1 & TP-2)

The following soil evaluations were made at each of the test pits:

• <u>Test Pit 1 (TP-1) – Existing grade = 117.4+</u>

0	0 – 16″	HTM	Fill
0	16 – 65"	Bw	Sand (Gravelly)
0	65 – 93"+	С	Sandy Loam

- Redoximorphic features (mottles) present at 68" (Elev. 111.7±)
- No signs of standing/weeping water
- No refusal encountered
- Test Pit 2 (TP-2) Existing grade @ edge of basin = 117.9±

0	0 – 36″	HTM	Fill
0	36 – 58"	Bw	Loamy Sand (Gravelly; firm in place)
0	58 – 92"+	С	Sandy Loam

- Redoximorphic features (mottles) present at 61" (Elev. 112.8±)
- No signs of standing/weeping water
- No refusal encountered



Image 1 –Location of TP-1



Image 2 –Evaluation of TP-1



Image 3 – Location of TP-2



Image 4 – Evaluation of TP-2

Jamie Veillette

From:	Wong, David W (DEP) <david.w.wong@mass.gov></david.w.wong@mass.gov>
Sent:	Wednesday, April 10, 2024 2:46 PM
То:	Jamie Veillette
Cc:	Ryan Paul; Alepidis, Kenneth (DEP)
Subject:	RE: [EXT] RE: Lake Cochichewick Boat Launch - 401 WQC Due Diligence and SAP

CAUTION

Hi Jamie,

Thanks for your additional information. It looks good and, as a result, the SAP is approved accordingly.

Good luck in the field and please let us know if you need any assistance in the future.

Sincerely,

David

David WH Wong, Ph.D. 401 Water Quality Certification Program Division of Wetlands and Waterways Bureau of Water Resources Massachusetts Department of Environmental Protection Phone: 617-874-7155 David.W.Wong@mass.gov

From: Jamie Veillette <jlv@envpartners.com>
Sent: Wednesday, April 10, 2024 11:42 AM
To: Wong, David W (DEP) <david.w.wong@mass.gov>
Cc: Ryan Paul <rjp@envpartners.com>; Alepidis, Kenneth (DEP) <Kenneth.Alepidis@mass.gov>
Subject: RE: [EXT] RE: Lake Cochichewick Boat Launch - 401 WQC Due Diligence and SAP

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Hi David,

Please see below for the final version for your approval. Thank you!

On behalf of the Town of North Andover, Environmental Partners is submitting this due diligence review and sampling analysis plan (SAP) in support of the Lake Cochichewick Boat Launch project located in North Andover, Massachusetts.

The project generally consists of the reconstruction of the existing boat launch, which has fallen into disrepair, a new mechanically stabilized earth (MSE) concrete block retaining wall to replace the existing concrete and cobble retaining wall, and rip rap slope stabilization adjacent to the wall. The project does not trigger any 401 Water Quality Certification (WQC) thresholds except that it is within an outstanding resource water.

The purpose of the sampling described in this plan is to collect sediment quality data to support 401 WQC application and the development of a Sediment Management Plan. The due diligence review and sampling analysis plan (SAP) is attached for your review. The SAP was developed in general accordance with the Massachusetts Department of Environmental Protection (MassDEP) 401 WQC regulations, 314 CMR 9.00.

We estimate the dredging of approximately 51 cubic yards for the new boat ramp and retaining wall within Lake Cochichewick (an Outstanding Resource Water). In accordance with the 401 WQC dredge material sampling and analysis requirements outlined at 314 CMR 9.07(2)(b), one sample core should be collected and characterized physically and chemically for every 1,000 cubic yards of proposed dredge material for projects up to 10,000 cubic yards, with a minimum of two samples collected. Therefore, we propose two samples; located at the boat launch, where the majority of work will occur. The samples shall be collected 3-ft below existing grade, which is the proposed maximum dredge depth. The two samples will be analyzed for parameters listed in 314 CMR 9.07(2)(b)6. No additional parameters are anticipated to be sampled for at this time.

Additionally, we've completed a due diligence review of publicly available records associated with the Project area and the general surrounding area. This review was performed to determine the potential for contamination in the dredged material. The due diligence review consists of current and past land uses of the surrounding area in addition to documents obtained from the Bureau of Waste Site Cleanup and the Massachusetts Department of Environmental Protection. A review of the land use and documentation showed nearby properties with open waste cleanup activities. The Town's 2021 Lake Cochichewick Watershed Plan was also reviewed for any other pertinent information to potential contaminants in the vicinity that could impact the sediment. The Watershed Plan includes a comparison of water quality data from 1986 vs. 2021 showing a general increase in the Lake's ecological health. Please refer to attachment 2 for files associated with the due diligence review.

Please let me know if the sampling plan (provided in attachment 1) is acceptable and we'll proceed with sampling prior to submitting the 401 WQC application.

Sincerely,



Jamie L. Veillette Senior Project Engineer She/Her O: 617.657.0960 Environmental Partners envpartners.com



Attachment 1 Sediment Sampling Plan



Attachment 2 Due Diligence Review MassDEP Phase 1 Site Assessment Map



Data Portal

Waste Site & Reportable Releases Results

HIDE MAP



Open Sites

Closed Sites O Closed Sites with Use Limitation

Search Criteria City/Town: NORTH ANDOVER

∢	4	1/2	

200 🗸	1 - 200 of 227 item	าร					
SELECT	RTN	CITY/TOWN	RELEASE ADDRES	SITE NAME LOCATION AID	REPORTING CATEGO	NOTIFICATION DA	COMPLIANCE
	3-0038353	NORTH ANDO	495 SB BETWEEN	495 SB BETWEEN EXITS 10	TWO HR	09/11/2023	UNCLASSIFIED
	3-0038268	NORTH ANDO	BRIGHTWOOD AVE	IN THE VICINITY OF #23	TWO HR	08/01/2023	PSNC
	3-0037993	NORTH ANDO	SALEM STREET	NEAR #2177	TWO HR	02/24/2023	UNCLASSIFIED
	3-0037729	NORTH ANDO	17 ROYAL CREST D	BEHIND BUILDING 17	TWO HR	08/08/2022	PSC
	3-0037342	NORTH ANDO	65 HIGH STREET	EAST MILL FLATS	120 DY	03/01/2022	PSC
	3-0037316	NORTH ANDO	75 HAY MEADOW R	RESIDENCE	TWO HR	02/10/2022	PSNC
	3-0037288	NORTH ANDO	216 FOSTER STREET	IN FRONT OF 216 FOSTER	TWO HR	01/24/2022	TIER 2
	3-0037094	NORTH ANDO	ADJACENT TO 638	PAD MOUNTED ELECTRIC	120 DY	10/18/2021	PSNC
	3-0037081	NORTH ANDO	1160 GREAT POND	THE BROOKS SCHOOL	72 HR	09/21/2021	PSNC
	3-0036589	NORTH ANDO	OSGOOD STREET (OSGOOD STREET AT GREA	TWO HR	11/05/2020	PSNC
	3-0036008	NORTH ANDO	1495 NORTHBOUND	ABOUT 200 YARDS NORT	TWO HR	12/02/2019	PSC
•	2 0025050					11/01/2010	DENC

1/2 ► ► 200 ► 1-200 of 227 items

		1	2	2	8	3	4		5		(3	7	7	٤	3	9)	1	0	1	1		
Parameter	Hatch	Brook	Foamy	Brook	Country C	lub Brook	Batel	Brook	Applehi	ll Brook	Mazuren	ko Brook	Rae's	Pond	in L	ake	Stevens	e Pond ^b	Brooks	School	Osgo	od Hill	Mea	ans
	2021	1986	2021	1986	2021	1986	2021	1986	2021	1986	2021	1986	2021	1986	2021	1986	2021	1986	2021	1986	2021	1986	2021	1986
Flow (L/s)		14.30	7.81	18.69	5.35	2.55	58.15	59.18	15.53	14.16	5.89	0.00		0.00					4.79					
рН	8.00	7.23	5.36		6.24		6.47		6.83		6.66	6.60	6.95		7.50	6.65	7.64	7.00	7.28		6.89		6.89	6.87
Air (C)	23.87		21.67		20.97		22.27		22.07		23.23		24.00		21.90		23.23		23.10		22.65		22.63	
Water (C)	20.90		18.00		17.63		19.43		18.73		20.60		21.37		20.10		22.07		18.10		21.50		19.86	
Color (NTU)	0.15		9.99		6.00		3.02		2.28		0.62		-0.54		-0.61		-0.52		26.40		-0.56		4.20	
Spec Con (uS/cm)	467.33	186.50	127.33		108.67		146.00		192.33		71.00	125.50	78.67		196.00	109.67	133.33	109.75	154.00		91.00		160.52	132.85
DO (mg/L)	9.18		8.30		5.93		3.88		7.44		3.69		6.56		7.09	5.65	8.92		9.06		7.69		7.07	5.65
DO%	103.25%		87.80%		60.10%		42.23%		80.10%		41.27%		74.73%		16.28%	62.49%	102.40%		96.45%		87.40%		0.72	
Ortho (ug/L)	0.007		0.073		0.010		0.013		0.012		0.015		0.013		0.003		0.004		0.024		0.003		0.02	
TP (ug/L)	0.032	0.037	0.130	0.131	0.082	0.015	0.048	0.033	0.033	0.072	0.049	0.140	0.049	0.044	0.005	0.023	0.013	0.065	0.069		0.034		0.049	0.062
Chloride (mg/L)	100.25	30.50	65.35	24.00	89.15	26.00	89.10	17.00	146.50	32.00	26.15	16.43	39.80	5.00	79.00	17.58	82.35	19.00	204.00		99.70		92.85	20.83
TN (mg/L)	0.70		2.80		1.55		0.84		1.50		0.94		0.73		0.56		0.56		1.95		0.68		1.16	
N-N (mg/L)	0.14	0.32	0.05	0.08	0.43	0.16	0.05	0.02	0.70	0.16	0.05	0.04	0.05	0.02	0.05	0.06	0.05	0.09	1.07		0.05		0.24	0.10
TKN (mg/L)	0.59	0.40	2.83	3.00	1.14	0.03	0.84	1.10	0.78	0.77	0.95	1.40	0.73	0.26	0.55	0.28	0.56	0.42	0.92		0.68		0.96	0.85
NH3-N (mg/L)	0.06	0.03	0.79		0.13		0.11		0.14		0.14	0.02	0.07		0.04	0.04	0.13	0.01	0.04		0.04		0.15	0.02
F Coli (MPN/L)	71.50	152.00	141.00	201.25	355.00	16.50	205.00	126.25	175.00	250.00	74.50	102.00	35.50	25.00	9.50	5.25	9.50	5.00	1260.00		34.50		215.55	98.14
Clarity (M)															4.00	3.28								
Chlorophyll-a (mg/L)															3.26	15.80								

Means for each Sampling Station by Parameter for Summer Months in 2021 and 1986

<u>Notes</u>

a. A comparison of data in common between the summer of 1986 and the summer of 2021 was performed. 1986 sampling results were taken from the 1987 Lake Cochichewick Watershed Plan. Means for each constituent were calculated and tabulated. The 1986 means included June to September. The 2021 means included July to September.

b. Sampled at the outlet to Cochichewick Lake.

c. For consistency of data within this plan, some units reported in the field sheets were converted in the summary tables. For example, ppm was converted to mg/L, mg/M3 was converted to ug/L, feet were converted to meters.

d. Grey cells in the table indicate data that was not calculated or collected deliberately. For example, flow data was not collected from lakes or ponds as they are not flowing bodies of water. Notwithstanding, data cells are included in the tables to make the data in the tables consistent and easier to compare across the three sampling events.



CHEMICAL ANALYSIS OF SEDIMENT

Two sediment core samples were collected at the proposed maximum dredge depth of 3 feet. The samples were collected on June 10, 2024 and submitted to ESS Laboratories for analysis of the parameters listed in 314 CMR 9.07(2)(b)(6).

The laboratory analytical results indicated the presence of various chemical compounds generally associated with background anthropogenic sources, including heavy metals, petroleum hydrocarbons, and polycyclic aromatic hydrocarbons (PAHs). Although not applicable to sediments in Massachusetts, several of the compounds detected exceeded the RCS-1 reportable concentrations established in 310 CMR 40.000 (the Massachusetts Contingency Plan). These included lead (detected at 300 mg/Kg in one sample) and the following PAHs detected in one or both samples: 2-methylnapthalene, acenapthylene, benzo(a)anthracene, benzo(a pyrene, benzo(b) flouranthene, dibenzo(a,h)anthracene, indeno(1,2,3-cd) pyrene, naphthalene and phenanthrene. Only total PAHs exceeded the maximum allowable contaminant level (MACL) for reuse at a Massachusetts Lined landfill.

Laboratory results provided herein met the 401 WQC reporting limit (RL) except for the extractable petroleum hydrocarbon (EPH) C9-C19 aliphatic range for both samples, and the C11-C22 aromatics range for sample S-1; elevated RLs were due to sample matrix. The elevated RL does not affect the usability of the data as the RLs are well below the applicable RCS-1 standard and the MACL. Table 1 indicates the acceptable levels at a lined landfill per COMM-94-007.

Contaminant (a)	Reuse Levels
Total Arsenic	40
Total Cadmium	80
Total Chromium	1,000
Total Lead	2,000
Total Mercury	10
Total Petroleum Hydrocarbons (TPH)	5,000

Table 1: Maximum Allowable Contaminant Levels for Sediment Reuse at Lined Landfills

Contaminant (a)	Reuse Levels
Total PBCs (b)	< 2
Total PAHs (c)	100
Total VOCs (d)	10
Listed or Characteristic Hazardous Waste (TCLP) (e)	none

Notes:

- 1. Contaminant concentrations are in mg/kg, dry weight.
- 2. Total concentrations of polychlorinated biphenyls listed in EPA Method 8080.
- 3. Total concentrations of polynuclear aromatic hydrocarbons listed in EPA Method 8100.
- 4. Total concentrations of volatile organic compounds listed in EPA Method 8240 or equivalent.
- TCLP testing should be performed for metals or organic compounds when the total concentrations in the sediments are above the theoretical levels at which the TCLP criteria may be met or exceeded. For the above metals such levels (mg/kg) are: As > 100, Cd > 20, Cr > 100, Pb > 100, Hg > 4.



CERTIFICATE OF ANALYSIS

Ryan Paul Environmental Partners Group, LLC 1900 Crown Colony Drive, Suite 402 Quincy, MA 02169

RE: North Lake Cochichewick Boat Launch (NOR120-0628071-23012245) ESS Laboratory Work Order Number: 24E1224

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.

Laure lotto Dad

Laurel Stoddard Laboratory Director

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.

Subcontracted Analyses CTS - Cranston, RI

Grain Size Analysis







Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

SAMPLE RECEIPT

The following samples were received on May 30, 2024 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by ESS Laboratory on 5/30/24 at 16:31.

Sample IDs 24E1224-01 and -02 for Metals were oven dried at 60 degrees Celsius prior to digestion and relogged in as Sample IDs 24E1224-03 and -04. This was done to increase the dry weight of the sample digested which decreases variability of results and lowers the detection limits for samples with high water content.

Lab Number	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
24E1224-01	S-1	Soil	2540G, 8082A Cong, 8260D Low, EPH8270,
			EPH8270SIM, LK, MADEP-EPH, SUB
24E1224-02	S-2	Soil	2540G, 8082A Cong, 8260D Low, EPH8270,
			EPH8270SIM, LK, MADEP-EPH, SUB
24E1224-03	S-1 - Oven Dried	Soil	6010D, 7471B
24E1224-04	S-2 - Oven Dried	Soil	6010D, 7471B



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

PROJECT NARRATIVE

8082 Polychlorinated Biphenyls (PCB) / Congeners

24E1224-01	Lower value is used due to matrix interferences (LC).
	BZ#138
24E1224-01	Percent difference between primary and confirmation results exceeds 40% (P).
	BZ#138
24E1224-02	Lower value is used due to matrix interferences (LC).
	BZ#138, BZ#153 [2C], BZ#170
24E1224-02	Percent difference between primary and confirmation results exceeds 40% (P).
	BZ#138, BZ#153 [2C], BZ#170

MADEP-EPH Extractable Petroleum Hydrocarbons

24E1224-01	<u>Elevated Method Reporting Limits due to sample matrix (EL).</u>
24E1224-02	Elevated Method Reporting Limits due to sample matrix (EL).
D4F0071-CCV4	<u>Continuing Calibration %Diff/Drift is above control limit (CD+).</u>
	O-Terphenyl (28% @ 25%)

Volatile Organics Low Level

D4F0006-CCV1	Continuing Calibration %Diff/Drift is below control limit (CD-).
	1,4-Dioxane (34% @ 20%), sec-Butylbenzene (27% @ 20%), Tetrachloroethene (38% @ 20%)
DF40102-BSD1	<u>Blank Spike recovery is below lower control limit (B-).</u>
	Tetrachloroethene (67% @ 70-130%)

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

Definitions of Quality Control Parameters

Semivolatile Organics Internal Standard Information

Semivolatile Organics Surrogate Information

Volatile Organics Internal Standard Information

Volatile Organics Surrogate Information

EPH and VPH Alkane Lists



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

CURRENT SW-846 METHODOLOGY VERSIONS

Prep Methods

Analytical Methods

1010A - Flashpoint 6010D - ICP 6020B - ICP MS 7010 - Graphite Furnace 7196A - Hexavalent Chromium 7470A - Aqueous Mercury 7471B - Solid Mercury 8011 - EDB/DBCP/TCP 8015C - GRO/DRO 8081B - Pesticides 8082A - PCB 8100M - TPH 8151A - Herbicides 8260D - VOA 8270E - SVOA 8270E SIM - SVOA Low Level 9014 - Cyanide 9038 - Sulfate 9040C - Aqueous pH 9045D - Solid pH (Corrosivity) 9050A - Specific Conductance 9056A - Anions (IC) 9060A - TOC 9095B - Paint Filter MADEP 19-2.1 - EPH MADEP 18-2.1 - VPH

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap

5035A - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



DIVISION OF THE RISE GROUP

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-1 Date Sampled: 05/29/24 19:01 Percent Solids: 78 Initial Volume: 5.6g Final Volume: 10ml Extraction Method: 5035

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-01 Sample Matrix: Soil Units: mg/kg dry Analyst: MEK Prepared: 6/1/24 8:00

Volatile Organics Low Level

ESS Laboratory

Analyte	<u>Results (MRL)</u>	MDL	Method	<u>Limit</u>	DF	<u>Analyst</u>	Analyzed	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,1,1-Trichloroethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,1,2,2-Tetrachloroethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,1,2-Trichloroethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,1-Dichloroethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,1-Dichloroethene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,1-Dichloropropene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,2,3-Trichlorobenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,2,3-Trichloropropane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,2,4-Trichlorobenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,2,4-Trimethylbenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,2-Dibromo-3-Chloropropane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,2-Dibromoethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,2-Dichlorobenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,2-Dichloroethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,2-Dichloropropane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,3,5-Trimethylbenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,3-Dichlorobenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,3-Dichloropropane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,4-Dichlorobenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
1,4-Dioxane	ND (0.115)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
2,2-Dichloropropane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
2-Butanone	ND (0.0573)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
2-Chlorotoluene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
2-Hexanone	ND (0.0573)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
4-Chlorotoluene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
4-Isopropyltoluene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102

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DIVISION OF THE RISE GROUP

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-1 Date Sampled: 05/29/24 19:01 Percent Solids: 78 Initial Volume: 5.6g Final Volume: 10ml Extraction Method: 5035

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-01 Sample Matrix: Soil Units: mg/kg dry Analyst: MEK Prepared: 6/1/24 8:00

Volatile Organics Low Level

ESS Laboratory

Analyte	<u>Results (MRL)</u>	<u>MDL</u>	Method	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	Analyzed	Sequence	Batch
4-Methyl-2-Pentanone	ND (0.0573)		8260D Low		I	MEK	06/02/24 2:02	D4F0006	DF40102
Acetone	ND (0.0573)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Benzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Bromobenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Bromochloromethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Bromodichloromethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Bromoform	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Bromomethane	ND (0.0115)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Carbon Disulfide	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Carbon Tetrachloride	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Chlorobenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Chloroethane	ND (0.0115)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Chloroform	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Chloromethane	ND (0.0115)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
cis-1,2-Dichloroethene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
cis-1,3-Dichloropropene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Dibromochloromethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Dibromomethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Dichlorodifluoromethane	ND (0.0115)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Diethyl Ether	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Di-isopropyl ether	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Ethyl tertiary-butyl ether	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Ethylbenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Hexachlorobutadiene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Isopropylbenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Methyl tert-Butyl Ether	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Methylene Chloride	ND (0.0286)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102

http://www.ESSLaboratory.com



DIVISION OF THE RISE GROUP

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-1 Date Sampled: 05/29/24 19:01 Percent Solids: 78 Initial Volume: 5.6g Final Volume: 10ml Extraction Method: 5035

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-01 Sample Matrix: Soil Units: mg/kg dry Analyst: MEK Prepared: 6/1/24 8:00

Volatile Organics Low Level

ESS Laboratory

<u>Analyte</u>	<u>Results (MRL)</u>	MDL	Method	<u>Limit</u>	DF	<u>Analyst</u>	Analyzed	<u>Sequence</u>	Batch
Naphthalene	0.0241 (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
n-Butylbenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
n-Propylbenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
sec-Butylbenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Styrene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
tert-Butylbenzene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Tertiary-amyl methyl ether	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Tetrachloroethene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Tetrahydrofuran	ND (0.0229)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Toluene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
trans-1,2-Dichloroethene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
trans-1,3-Dichloropropene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Trichloroethene	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Trichlorofluoromethane	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Vinyl Chloride	ND (0.0115)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Xylene O	ND (0.0057)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Xylene P,M	ND (0.0115)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
Xylenes (Total)	ND (0.0115)		8260D Low		1	MEK	06/02/24 2:02	D4F0006	DF40102
		%Recovery	Qualifier	Limits					
Surrogate: 1,2-Dichloroethane-d4		124 %		70-130					
Surrogate: 4-Bromofluorobenzene		94 %		70-130					
Surrogate: Dibromofluoromethane		113 %		70-130					
Surrogate: Toluene-d8		106 %		70-130					



DIVISION OF THE RISE GROUP

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-1 Date Sampled: 05/29/24 19:01 Percent Solids: 78 Initial Volume: 10.3g Final Volume: 2ml Extraction Method: 3546

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-01 Sample Matrix: Soil Units: mg/kg dry

Prepared: 6/4/24 10:00

MADEP-EPH Extractable Petroleum Hydrocarbons

ESS Laboratory

Analyte	<u>Results (MRL)</u>	MDL	Method	<u>Limit</u>	DF	Analyst	Analyzed	<u>Sequence</u>	Batch
C9-C18 Aliphatics1	ND (93.4)		MADEP-EPH		1	JDN	06/05/24 17:44	D4F0063	DF40411
C19-C36 Aliphatics1	135 (93.4)		MADEP-EPH		1	JDN	06/05/24 17:44	D4F0063	DF40411
C11-C22 Unadjusted Aromatics1	339 (187)		EPH8270		2	IBM	06/05/24 0:31	D4F0071	DF40411
C11-C22 Aromatics1,2	ND (189)		EPH8270			TJ	06/05/24 0:31		[CALC]
2-Methylnaphthalene	0.650 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Acenaphthene	3.46 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Naphthalene	1.98 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Phenanthrene	20.7 (0.498)		EPH8270SIM		10	TJ	06/04/24 20:53	D4F0057	DF40411
Acenaphthylene	0.125 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Anthracene	6.33 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Benzo(a)anthracene	11.3 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Benzo(a)pyrene	10.1 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Benzo(b)fluoranthene	8.46 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Benzo(g,h,i)perylene	4.73 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Benzo(k)fluoranthene	8.32 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Chrysene	10.6 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Dibenzo(a,h)Anthracene	2.44 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Fluoranthene	30.9 (0.498)		EPH8270SIM		10	TJ	06/04/24 20:53	D4F0057	DF40411
Fluorene	2.75 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Indeno(1,2,3-cd)Pyrene	4.54 (0.050)		EPH8270SIM		1	TJ	06/04/24 20:11	D4F0057	DF40411
Pyrene	24.0 (0.498)		EPH8270SIM		10	TJ	06/04/24 20:53	D4F0057	DF40411
		%Recovery	Qualifier	Limits					

³ <i>o</i> Recovery	Quanner	LIIIIILS
54 %		40-140
105 %		40-140
107 %		40-140
64 %		40-140
	54 % 105 % 107 % 64 %	54 % 105 % 107 % 64 %

Fax: 401-461-4486 Service



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-1 Date Sampled: 05/29/24 19:01 Percent Solids: 78

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-01 Sample Matrix: Soil

Classical Chemistry

<u>Analyte</u>	<u>Results (MRL)</u>	MDL	Method	<u>Limit</u>	DF	<u>Analyst</u>	Analyzed	<u>Units</u>	Batch
Percent Moisture	22 (1)		2540G		1	CCP	05/30/24 17:19	%	DE43053
Total Organic Carbon (Average)	52700 (500)		LK		1	CCP	06/03/24 14:29	mg/kg	[CALC]



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-1 Date Sampled: 05/29/24 19:01

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-01 Sample Matrix: Soil

Subcontracted Analysis

<u>Analyte</u>	Results (MRL)	MDL	Method	<u>Limit</u>	DF	<u>Analyst</u>	Analyzed	<u>Units</u>	Batch
Grain Size	See Attached (N/A)							%	



DIVISION OF THE RISE GROUP

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-1 Date Sampled: 05/29/24 19:01 Percent Solids: 78 Initial Volume: 30.6g Final Volume: 2ml Extraction Method: 3540C

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-01 Sample Matrix: Soil Units: mg/kg dry Analyst: DMC Prepared: 6/3/24 11:15

8082 Polychlorinated Biphenyls (PCB) / Congeners

ESS Laboratory

Analyte	<u>Results (MRL)</u>	MDL	Method	<u>Limit</u>	DF	Analyzed	Sequence	Batch
BZ#8	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#18	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#28 [2C]	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#44	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#52	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#66	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#101	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#105 [2C]	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#118 [2C]	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#128 [2C]	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#138	P, LC 0.00053 (0.0003	34)	8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#153 [2C]	0.00077 (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#170	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#180	0.00056 (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#187	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#195	ND (0.00034)		8082A Cong		1	06/05/24 14:50	D4F0078	DF40311
BZ#206 [2C]	0.0130 (0.00170)		8082A Cong		5	06/05/24 16:22	D4F0078	DF40311
BZ#209 [2C]	0.0320 (0.00170)		8082A Cong		5	06/05/24 16:22	D4F0078	DF40311
	%R	ecovery	Qualifier	Limits				

Surrogate: Tetrachloro-m-xylene [2C]

102 %

30-150



DIVISION OF THE RISE GROUP

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-2 Date Sampled: 05/29/24 19:20 Percent Solids: 81 Initial Volume: 5.3g Final Volume: 10ml Extraction Method: 5035

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-02 Sample Matrix: Soil Units: mg/kg dry Analyst: MEK Prepared: 6/1/24 8:00

Volatile Organics Low Level

ESS Laboratory

Analyte	<u>Results (MRL)</u>	MDL	Method	<u>Limit</u>	DF	<u>Analyst</u>	Analyzed	<u>Sequence</u>	Batch
1,1,1,2-Tetrachloroethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,1,1-Trichloroethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,1,2,2-Tetrachloroethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,1,2-Trichloroethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,1-Dichloroethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,1-Dichloroethene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,1-Dichloropropene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,2,3-Trichlorobenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,2,3-Trichloropropane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,2,4-Trichlorobenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,2,4-Trimethylbenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,2-Dibromo-3-Chloropropane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,2-Dibromoethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,2-Dichlorobenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,2-Dichloroethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,2-Dichloropropane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,3,5-Trimethylbenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,3-Dichlorobenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,3-Dichloropropane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,4-Dichlorobenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
1,4-Dioxane	ND (0.117)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
2,2-Dichloropropane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
2-Butanone	ND (0.0586)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
2-Chlorotoluene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
2-Hexanone	ND (0.0586)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
4-Chlorotoluene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
4-Isopropyltoluene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102

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Analytical Balance 🗯

DIVISION OF THE RISE GROUP

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-2 Date Sampled: 05/29/24 19:20 Percent Solids: 81 Initial Volume: 5.3g Final Volume: 10ml Extraction Method: 5035

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-02 Sample Matrix: Soil Units: mg/kg dry Analyst: MEK Prepared: 6/1/24 8:00

Volatile Organics Low Level

ESS Laboratory

Analyte	<u>Results (MRL)</u>	MDL	Method	<u>Limit</u>	DF	<u>Analyst</u>	Analyzed	<u>Sequence</u>	Batch
4-Methyl-2-Pentanone	ND (0.0586)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Acetone	ND (0.0586)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Benzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Bromobenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Bromochloromethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Bromodichloromethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Bromoform	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Bromomethane	ND (0.0117)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Carbon Disulfide	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Carbon Tetrachloride	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Chlorobenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Chloroethane	ND (0.0117)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Chloroform	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Chloromethane	ND (0.0117)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
cis-1,2-Dichloroethene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
cis-1,3-Dichloropropene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Dibromochloromethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Dibromomethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Dichlorodifluoromethane	ND (0.0117)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Diethyl Ether	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Di-isopropyl ether	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Ethyl tertiary-butyl ether	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Ethylbenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Hexachlorobutadiene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Isopropylbenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Methyl tert-Butyl Ether	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Methylene Chloride	ND (0.0293)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102

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Analytical Balance 🗯

DIVISION OF THE RISE GROUP

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-2 Date Sampled: 05/29/24 19:20 Percent Solids: 81 Initial Volume: 5.3g Final Volume: 10ml Extraction Method: 5035

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-02 Sample Matrix: Soil Units: mg/kg dry Analyst: MEK Prepared: 6/1/24 8:00

Volatile Organics Low Level

ESS Laboratory

<u>Analyte</u>	Results (MRL)	MDL	Method	<u>Limit</u>	DF	<u>Analyst</u>	Analyzed	<u>Sequence</u>	Batch
Naphthalene	0.226 (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
n-Butylbenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
n-Propylbenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
sec-Butylbenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Styrene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
tert-Butylbenzene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Tertiary-amyl methyl ether	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Tetrachloroethene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Tetrahydrofuran	ND (0.0234)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Toluene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
trans-1,2-Dichloroethene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
trans-1,3-Dichloropropene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Trichloroethene	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Trichlorofluoromethane	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Vinyl Chloride	ND (0.0117)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Xylene O	ND (0.0059)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Xylene P,M	ND (0.0117)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
Xylenes (Total)	ND (0.0117)		8260D Low		1	MEK	06/02/24 2:27	D4F0006	DF40102
		%Recovery	Qualifier	Limits					
Surrogate: 1,2-Dichloroethane-d4		120 %		70-130					
Surrogate: 4-Bromofluorobenzene		88 %		70-130					
Surrogate: Dibromofluoromethane		110 %		70-130					
Surrogate: Toluene-d8		108 %		70-130					



Analytical Balance 🗯

DIVISION OF THE RISE GROUP

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-2 Date Sampled: 05/29/24 19:20 Percent Solids: 81 Initial Volume: 10.4g Final Volume: 2ml Extraction Method: 3546

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-02 Sample Matrix: Soil Units: mg/kg dry

Prepared: 6/4/24 10:00

MADEP-EPH Extractable Petroleum Hydrocarbons

ESS Laboratory

<u>Analyte</u>	<u>Results (MRL)</u>	MDL	Method	<u>Limit</u>	DF	<u>Analyst</u>	<u>Analyzed</u>	<u>Sequence</u>	Batch
C9-C18 Aliphatics1	ND (89.5)		MADEP-EPH		1	JDN	06/05/24 18:18	D4F0063	DF40411
C19-C36 Aliphatics1	336 (89.5)		MADEP-EPH		1	JDN	06/05/24 18:18	D4F0063	DF40411
C11-C22 Unadjusted Aromatics1	1600 (179)		EPH8270		2	IBM	06/05/24 1:07	D4F0071	DF40411
C11-C22 Aromatics1,2	740 (199)		EPH8270			TJ	06/05/24 1:07		[CALC]
2-Methylnaphthalene	4.83 (0.048)		EPH8270SIM		1	TJ	06/04/24 20:32	D4F0057	DF40411
Acenaphthene	22.0 (0.478)		EPH8270SIM		10	TJ	06/04/24 21:14	D4F0057	DF40411
Naphthalene	12.7 (0.478)		EPH8270SIM		10	TJ	06/04/24 21:14	D4F0057	DF40411
Phenanthrene	144 (4.78)		EPH8270SIM		100	TJ	06/04/24 21:55	D4F0057	DF40411
Acenaphthylene	0.568 (0.048)		EPH8270SIM		1	TJ	06/04/24 20:32	D4F0057	DF40411
Anthracene	48.8 (0.478)		EPH8270SIM		10	TJ	06/04/24 21:14	D4F0057	DF40411
Benzo(a)anthracene	62.2 (0.478)		EPH8270SIM		10	TJ	06/04/24 21:14	D4F0057	DF40411
Benzo(a)pyrene	51.0 (0.478)		EPH8270SIM		10	TJ	06/04/24 21:14	D4F0057	DF40411
Benzo(b)fluoranthene	43.6 (0.478)		EPH8270SIM		10	TJ	06/04/24 21:14	D4F0057	DF40411
Benzo(g,h,i)perylene	20.3 (0.478)		EPH8270SIM		10	TJ	06/04/24 21:14	D4F0057	DF40411
Benzo(k)fluoranthene	42.9 (0.478)		EPH8270SIM		10	TJ	06/04/24 21:14	D4F0057	DF40411
Chrysene	58.0 (0.478)		EPH8270SIM		10	TJ	06/04/24 21:14	D4F0057	DF40411
Dibenzo(a,h)Anthracene	10.2 (0.048)		EPH8270SIM		1	TJ	06/04/24 20:32	D4F0057	DF40411
Fluoranthene	167 (4.78)		EPH8270SIM		100	TJ	06/04/24 21:55	D4F0057	DF40411
Fluorene	19.4 (0.478)		EPH8270SIM		10	TJ	06/04/24 21:14	D4F0057	DF40411
Indeno(1,2,3-cd)Pyrene	20.4 (0.478)		EPH8270SIM		10	TJ	06/04/24 21:14	D4F0057	DF40411
Pyrene	137 (4.78)		EPH8270SIM		100	TJ	06/04/24 21:55	D4F0057	DF40411
		%Recovery	Qualifier	Limits					
Surragate: 1-Chlorooctadecane		17.04		10 1 10					

	· · ·	
Surrogate: 1-Chlorooctadecane	47 %	40-140
Surrogate: 2-Bromonaphthalene	<i>99 %</i>	40-140
Surrogate: 2-Fluorobiphenyl	101 %	40-140
Surrogate: O-Terphenyl	47 %	40-140



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-2 Date Sampled: 05/29/24 19:20 Percent Solids: 81

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-02 Sample Matrix: Soil

Classical Chemistry

<u>Analyte</u>	Results (MRL)	MDL	Method	<u>Limit</u>	DF	<u>Analyst</u>	Analyzed	<u>Units</u>	Batch
Percent Moisture	19 (1)		2540G		1	CCP	05/30/24 17:19	%	DE43053
Total Organic Carbon (Average)	91300 (500)		LK		1	CCP	06/03/24 14:46	mg/kg	[CALC]



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-2 Date Sampled: 05/29/24 19:20

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-02 Sample Matrix: Soil

Subcontracted Analysis

<u>Analyte</u>	Results (MRL)	MDL	Method	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	Analyzed	<u>Units</u>	Batch
Grain Size	See Attached (N/A)							%	



Analytical Balance

DIVISION OF THE RISE GROUP

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-2 Date Sampled: 05/29/24 19:20 Percent Solids: 81 Initial Volume: 30.4g Final Volume: 2ml Extraction Method: 3540C

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-02 Sample Matrix: Soil Units: mg/kg dry Analyst: DMC Prepared: 6/3/24 11:15

8082 Polychlorinated Biphenyls (PCB) / Congeners

ESS Laboratory

<u>Analyte</u>	<u>Results (MRL)</u>	MDL	Method	<u>Limit</u>	DF	Analyzed	Sequence	Batch
BZ#8	ND (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#18	ND (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#28	ND (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#44	ND (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#52 [2C]	ND (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#66	ND (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#101	ND (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#105	ND (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#118 [2C]	ND (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#128	ND (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#138	P, LC 0.00060 (0.00	033)	8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#153 [2C]	P, LC 0.00063 (0.00	033)	8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#170	P, LC 0.00047 (0.00	033)	8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#180	0.00081 (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#187 [2C]	0.00072 (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#195	ND (0.00033)		8082A Cong		1	06/05/24 15:21	D4F0078	DF40311
BZ#206 [2C]	0.0492 (0.00662)		8082A Cong		20	06/06/24 9:05	D4F0078	DF40311
BZ#209 [2C]	0.129 (0.00662)		8082A Cong		20	06/06/24 9:05	D4F0078	DF40311
	%	6Recovery	Qualifier	Limits				

Surrogate: Tetrachloro-m-xylene [2C]

73 %

30-150



BAL Laboratory 🗯

Analytical Balance 🗯

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-1 - Oven Dried Date Sampled: 05/29/24 19:01 Percent Solids: 100

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-03 Sample Matrix: Soil Units: mg/kg dry

Extraction Method: 3050B

Total Metals

<u>Analyte</u>	Results (MRL)	MDL	Method	<u>Limit</u>	DF	<u>Analyst</u>	<u>Analyzed</u>	IV / FV	Batch
Arsenic	6.80 (0.35)		6010D		1	KJB	06/04/24 14:40	5.68 100	DF40303
Cadmium	ND (0.09)		6010D		1	KJB	06/04/24 14:40	5.68 100	DF40303
Chromium	23.0 (0.35)		6010D		1	KJB	06/04/24 14:40	5.68 100	DF40303
Copper	18.6 (0.88)		6010D		1	KJB	06/04/24 14:40	5.68 100	DF40303
Lead	43.9 (1.76)		6010D		1	KJB	06/04/24 14:40	5.68 100	DF40303
Mercury	0.078 (0.010)		7471B		1	CEV	06/03/24 12:31	2.03 40	DF40304
Nickel	17.1 (0.88)		6010D		1	KJB	06/04/24 14:40	5.68 100	DF40303
Zinc	42.2 (0.88)		6010D		1	KJB	06/04/24 14:40	5.68 100	DF40303



BAL Laboratory 🗯

Analytical Balance 🗯

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch Client Sample ID: S-2 - Oven Dried Date Sampled: 05/29/24 19:20 Percent Solids: 100

ESS Laboratory Work Order: 24E1224 ESS Laboratory Sample ID: 24E1224-04 Sample Matrix: Soil Units: mg/kg dry

Extraction Method: 3050B

Total Metals

<u>Analyte</u>	Results (MRL)	MDL	Method	<u>Limit</u>	DF	<u>Analyst</u>	Analyzed	IV / FV	Batch
Arsenic	9.10 (0.34)		6010D		1	KJB	06/04/24 14:42	5.95 100	DF40303
Cadmium	0.62 (0.08)		6010D		1	KJB	06/04/24 14:42	5.95 100	DF40303
Chromium	38.8 (0.34)		6010D		1	KJB	06/04/24 14:42	5.95 100	DF40303
Copper	50.3 (0.84)		6010D		1	KJB	06/04/24 14:42	5.95 100	DF40303
Lead	300 (1.68)		6010D		1	KJB	06/04/24 14:42	5.95 100	DF40303
Mercury	0.925 (0.182)		7471B		20	CEV	06/03/24 12:53	2.17 40	DF40304
Nickel	24.6 (0.84)		6010D		1	KJB	06/04/24 14:42	5.95 100	DF40303
Zinc	229 (0.84)		6010D		1	KJB	06/04/24 14:42	5.95 100	DF40303



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
			Total Meta	ls						-
Blank										
Arsenic	ND	1.00	ma/ka wet							
Cadmium	ND	0.25	mg/kg wet							
Chromium	ND	1.00	mg/kg wet							
Copper	ND	2.50	mg/kg wet							
Lead	ND	5.00	ma/ka wet							
Nickel	ND	2.50	mg/kg wet							
Zinc	ND	2.50	mg/kg wet							
Arsenic	62.5	3,33	ma/ka wet	75.60		83	80-120			
Cadmium	215	0.83	mg/kg wet	259.0		83	80-120			
Chromium	138	3,33	mg/kg wet	156.0		88	80-120			
Copper	183	8.33	mg/kg wet	210.0		87	80-120			
Lead	188	16.7	mg/kg wet	225.0		84	80-120			
Nickel	151	8.33	mg/kg wet	174.0		86	80-120			
Zinc	661	8.33	mg/kg wet	806.0		82	80-120			
	71 5	3 33	ma/ka wet	75.60		95	80-120	13	30	
Cadmium	240	0.83	mg/kg wet	259.0		93	80-120	11	30	
Chromium	154	3.33	mg/kg wet	156.0		99	80-120	11	30	
Copper	204	8.33	ma/ka wet	210.0		97	80-120	11	30	
Lead	211	16.7	mg/kg wet	225.0		94	80-120	11	30	
Nickel	167	8.33	ma/ka wet	174.0		96	80-120	11	30	
Zinc	734	8.33	mg/kg wet	806.0		91	80-120	11	30	
Batch DF40304 - 245.1/7470A										
Blank										
Mercury	ND	0.030	mg/kg wet							
Mercury	21.7	3 14	ma/ka wet	25 50		85	80-120			
	21.7	5.11	ing/kg wet	23.50		00	00 120			
LCS Dup	22.4	2 75	ma/ka wat	25 50		00	90 120	2	20	
mercury	22.4	Volati	ile Organics I	ow Leve	4	00	80-120	5	30	
		r orac								
Batch DF40102 - 5035										
Blank										
1,1,1,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,1-Trichloroethane	ND	0.0050	mg/kg wet							
1,1,2,2-Tetrachloroethane	ND	0.0050	mg/kg wet							
1,1,2-Trichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethane	ND	0.0050	mg/kg wet							
1,1-Dichloroethene	ND	0.0050	mg/kg wet							
1,1-Dichloropropene	ND	0.0050	mg/kg wet							
185 Frances Avenue	e, Cranston, RI 02910-	2211 Te Dependabilitv	el: 401-461-71 • Qu	81 F ality ∢	ax: 401-46 Servi	61-4486 ce	<u>http://w</u>	ww.ESS	Laboratory	<u>.com</u>
		. ,		-					P	age 21 of 40



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

				Spika	Source		%PFC		<u>Rbu</u>	
Analyte	Result	MRL	Units	Level	Result	%REC	Limits	RPD	Limit	Qualifier
		Volati	le Organics I	Low Leve		-				-
			-							
Batch DF40102 - 5035										
1,2,3-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,3-Trichloropropane	ND	0.0050	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.0050	mg/kg wet							
1,2,4-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,2-Dibromo-3-Chloropropane	ND	0.0050	mg/kg wet							
1,2-Dibromoethane	ND	0.0050	mg/kg wet							
1,2-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,2-Dichloroethane	ND	0.0050	mg/kg wet							
1,2-Dichloropropane	ND	0.0050	mg/kg wet							
1,3,5-Trimethylbenzene	ND	0.0050	mg/kg wet							
1,3-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,3-Dichloropropane	ND	0.0050	mg/kg wet							
1,4-Dichlorobenzene	ND	0.0050	mg/kg wet							
1,4-Dioxane	ND	0.100	mg/kg wet							
2,2-Dichloropropane	ND	0.0050	mg/kg wet							
2-Butanone	ND	0.0500	mg/kg wet							
2-Chlorotoluene	ND	0.0050	mg/kg wet							
2-Hexanone	ND	0.0500	mg/kg wet							
4-Chlorotoluene	ND	0.0050	mg/kg wet							
4-Isopropyltoluene	ND	0.0050	mg/kg wet							
4-Methyl-2-Pentanone	ND	0.0500	mg/kg wet							
Acetone	ND	0.0500	mg/kg wet							
Benzene	ND	0.0050	mg/kg wet							
Bromobenzene	ND	0.0050	mg/kg wet							
Bromochloromethane	ND	0.0050	mg/kg wet							
Bromodichloromethane	ND	0.0050	mg/kg wet							
Bromoform	ND	0.0050	mg/kg wet							
Bromomethane	ND	0.0100	mg/kg wet							
Carbon Disulfide	ND	0.0050	mg/kg wet							
Carbon Tetrachloride	ND	0.0050	mg/kg wet							
Chlorobenzene	ND	0.0050	mg/kg wet							
Chloroethane	ND	0.0100	mg/kg wet							
Chloroform	ND	0.0050	mg/kg wet							
Chloromethane	ND	0.0100	mg/kg wet							
cis-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
cis-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Dibromochloromethane	ND	0.0050	mg/kg wet							
Dibromomethane	ND	0.0050	mg/kg wet							
Dichlorodifluoromethane	ND	0.0100	mg/kg wet							
Diethyl Ether	ND	0.0050	mg/kg wet							
Di-isopropyl ether	ND	0.0050	mg/kg wet							
Ethyl tertiary-butyl ether	ND	0.0050	mg/kg wet							
Ethylbenzene	ND	0.0050	mg/kg wet							
Hexachlorobutadiene	ND	0.0050	mg/kg wet							

185 Frances Avenue, Cranston, RI 02910-2211

-2211 Tel: 401-461-7181 Dependability • Quality 

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
		Volati	ile Organics I	low Leve	I					
Batch DF40102 - 5035										
Isopropylbenzene	ND	0.0050	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.0050	mg/kg wet							
Methylene Chloride	ND	0.0250	mg/kg wet							
Naphthalene	ND	0.0050	mg/kg wet							
n-Butylbenzene	ND	0.0050	mg/kg wet							
n-Propylbenzene	ND	0.0050	mg/kg wet							
sec-Butylbenzene	ND	0.0050	mg/kg wet							
Styrene	ND	0.0050	mg/kg wet							
tert-Butylbenzene	ND	0.0050	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.0050	mg/kg wet							
Tetrachloroethene	ND	0.0050	mg/kg wet							
Tetrahydrofuran	ND	0.0200	mg/kg wet							
Toluene	ND	0.0050	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.0050	mg/kg wet							
trans-1,3-Dichloropropene	ND	0.0050	mg/kg wet							
Trichloroethene	ND	0.0050	mg/kg wet							
Trichlorofluoromethane	ND	0.0050	mg/kg wet							
Vinyl Chloride	ND	0.0100	mg/kg wet							
Xylene O	ND	0.0050	mg/kg wet							
Xylene P,M	ND	0.0100	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	0.0562		mg/kg wet	0.05000		112	70-130			
Surrogate: 4-Bromofluorobenzene	0.0497		mg/kg wet	0.05000		99	70-130			
Surrogate: Dibromofluoromethane	0.0535		mg/kg wet	0.05000		107	70-130			
- Surrogate: Toluene-d8	0.0506		mg/kg wet	0.05000		101	70-130			
LCS										
1,1,1,2-Tetrachloroethane	0.0512	0.0050	mg/kg wet	0.05000		102	70-130			
1,1,1-Trichloroethane	0.0528	0.0050	mg/kg wet	0.05000		106	70-130			
1,1,2,2-Tetrachloroethane	0.0492	0.0050	mg/kg wet	0.05000		98	40-160			
1,1,2-Trichloroethane	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
1,1-Dichloroethane	0.0500	0.0050	mg/kg wet	0.05000		100	70-130			
1,1-Dichloroethene	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
1,1-Dichloropropene	0.0506	0.0050	mg/kg wet	0.05000		101	70-130			
1,2,3-Trichlorobenzene	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
1,2,3-Trichloropropane	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
1,2,4-Trichlorobenzene	0.0508	0.0050	mg/kg wet	0.05000		102	70-130			
1,2,4-Trimethylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,2-Dibromo-3-Chloropropane	0.0438	0.0050	mg/kg wet	0.05000		88	70-130			
1,2-Dibromoethane	0.0478	0.0050	mg/kg wet	0.05000		96	70-130			
1,2-Dichlorobenzene	0.0465	0.0050	mg/kg wet	0.05000		93	70-130			
1,2-Dichloroethane	0.0522	0.0050	mg/kg wet	0.05000		104	70-130			
1,2-Dichloropropane	0.0509	0.0050	mg/kg wet	0.05000		102	70-130			
1,3,5-Trimethylbenzene	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
1,3-Dichlorobenzene	0.0479	0.0050	mg/kg wet	0.05000		96	70-130			
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Dependability

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Quality

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Service



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
		Volati	le Organics I	ow Level	I					
Batch DF40102 - 5035										
1,3-Dichloropropane	0.0504	0.0050	mg/kg wet	0.05000		101	70-130			
1,4-Dichlorobenzene	0.0482	0.0050	mg/kg wet	0.05000		96	70-130			
1,4-Dioxane	0.927	0.100	mg/kg wet	1.000		93	70-130			
2,2-Dichloropropane	0.0534	0.0050	mg/kg wet	0.05000		107	70-130			
2-Butanone	0.249	0.0500	mg/kg wet	0.2500		99	40-160			
2-Chlorotoluene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
2-Hexanone	0.236	0.0500	mg/kg wet	0.2500		94	40-160			
4-Chlorotoluene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
4-Isopropyltoluene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
4-Methyl-2-Pentanone	0.234	0.0500	mg/kg wet	0.2500		94	40-160			
Acetone	0.220	0.0500	mg/kg wet	0.2500		88	40-160			
Benzene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
Bromobenzene	0.0483	0.0050	mg/kg wet	0.05000		97	70-130			
Bromochloromethane	0.0486	0.0050	mg/kg wet	0.05000		97	70-130			
Bromodichloromethane	0.0593	0.0050	mg/kg wet	0.05000		119	70-130			
Bromoform	0.0414	0.0050	mg/kg wet	0.05000		83	40-160			
Bromomethane	0.0448	0.0100	mg/kg wet	0.05000		90	40-160			
Carbon Disulfide	0.0533	0.0050	mg/kg wet	0.05000		107	70-130			
Carbon Tetrachloride	0.0564	0.0050	mg/kg wet	0.05000		113	70-130			
Chlorobenzene	0.0488	0.0050	mg/kg wet	0.05000		98	70-130			
Chloroethane	0.0466	0.0100	mg/kg wet	0.05000		93	40-160			
Chloroform	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
Chloromethane	0.0439	0.0100	mg/kg wet	0.05000		88	40-160			
cis-1,2-Dichloroethene	0.0494	0.0050	mg/kg wet	0.05000		99	70-130			
cis-1,3-Dichloropropene	0.0531	0.0050	mg/kg wet	0.05000		106	40-160			
Dibromochloromethane	0.0485	0.0050	mg/kg wet	0.05000		97	40-160			
Dibromomethane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130			
Dichlorodifluoromethane	0.0298	0.0100	mg/kg wet	0.05000		60	40-160			
Diethyl Ether	0.0513	0.0050	mg/kg wet	0.05000		103	70-130			
Di-isopropyl ether	0.0543	0.0050	mg/kg wet	0.05000		109	70-130			
Ethyl tertiary-butyl ether	0.0503	0.0050	mg/kg wet	0.05000		101	70-130			
Ethylbenzene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130			
Hexachlorobutadiene	0.0482	0.0050	mg/kg wet	0.05000		96	40-160			
Isopropylbenzene	0.0549	0.0050	mg/kg wet	0.05000		110	70-130			
Methyl tert-Butyl Ether	0.0485	0.0050	mg/kg wet	0.05000		97	70-130			
Methylene Chloride	0.0445	0.0250	mg/kg wet	0.05000		89	70-130			
Naphthalene	0.0439	0.0050	mg/kg wet	0.05000		88	40-160			
n-Butylbenzene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
n-Propylbenzene	0.0520	0.0050	mg/kg wet	0.05000		104	70-130			
sec-Butylbenzene	0.0404	0.0050	mg/kg wet	0.05000		81	70-130			
Styrene	0.0480	0.0050	mg/kg wet	0.05000		96	40-160			
tert-Butylbenzene	0.0499	0.0050	mg/kg wet	0.05000		100	70-130			
Tertiary-amyl methyl ether	0.0493	0.0050	mg/kg wet	0.05000		99	70-130			
Tetrachloroethene	0.0350	0.0050	mg/kg wet	0.05000		70	70-130			

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Quality



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
		Vola	atile Organics I	Low Leve	I					
Batch DF40102 - 5035										
Tetrahydrofuran	0.0485	0.0200	mg/kg wet	0.05000		97	70-130			
Toluene	0.0491	0.0050	mg/kg wet	0.05000		98	70-130			
trans-1,2-Dichloroethene	0.0495	0.0050	mg/kg wet	0.05000		99	70-130			
trans-1,3-Dichloropropene	0.0515	0.0050	mg/kg wet	0.05000		103	70-130			
Trichloroethene	0.0481	0.0050	mg/kg wet	0.05000		96	70-130			
Trichlorofluoromethane	0.0505	0.0050	mg/kg wet	0.05000		101	40-160			
Vinyl Chloride	0.0445	0.0100	mg/kg wet	0.05000		89	70-130			
Xylene O	0.0510	0.0050	mg/kg wet	0.05000		102	70-130			
Xylene P,M	0.103	0.0100	mg/kg wet	0.1000		103	70-130			
Surrogate: 1.2-Dichloroethane-d4	0.0527		mg/kg wet	0.05000		105	70-130			
Surrogate: 4-Bromofluorobenzene	0.0495		mg/kg wet	0.05000		99	70-130			
Surrogate: Dibromofluoromethane	0.0521		mg/kg wet	0.05000		104	70-130			
Surrogate: Toluene-d8	0.0513		mg/kg wet	0.05000		103	70-130			
LCS Dup										
1,1,1,2-Tetrachloroethane	0.0501	0.0050	mg/kg wet	0.05000		100	70-130	2	20	
1,1,1-Trichloroethane	0.0520	0.0050	mg/kg wet	0.05000		104	70-130	1	20	
1,1,2,2-Tetrachloroethane	0.0461	0.0050	mg/kg wet	0.05000		92	40-160	6	20	
1,1,2-Trichloroethane	0.0494	0.0050	mg/kg wet	0.05000		99	70-130	0.3	20	
1,1-Dichloroethane	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	0.8	20	
1,1-Dichloroethene	0.0485	0.0050	mg/kg wet	0.05000		97	70-130	0.08	20	
1,1-Dichloropropene	0.0496	0.0050	mg/kg wet	0.05000		99	70-130	2	20	
1,2,3-Trichlorobenzene	0.0456	0.0050	mg/kg wet	0.05000		91	70-130	8	20	
1,2,3-Trichloropropane	0.0403	0.0050	mg/kg wet	0.05000		81	70-130	8	20	
1,2,4-Trichlorobenzene	0.0478	0.0050	mg/kg wet	0.05000		96	70-130	6	20	
1,2,4-Trimethylbenzene	0.0468	0.0050	mg/kg wet	0.05000		94	70-130	9	20	
1,2-Dibromo-3-Chloropropane	0.0408	0.0050	mg/kg wet	0.05000		82	70-130	7	20	
1,2-Dibromoethane	0.0475	0.0050	mg/kg wet	0.05000		95	70-130	0.6	20	
1,2-Dichlorobenzene	0.0433	0.0050	mg/kg wet	0.05000		87	70-130	7	20	
1,2-Dichloroethane	0.0514	0.0050	mg/kg wet	0.05000		103	70-130	2	20	
1,2-Dichloropropane	0.0507	0.0050	mg/kg wet	0.05000		101	70-130	0.4	20	
1,3,5-Trimethylbenzene	0.0472	0.0050	mg/kg wet	0.05000		94	70-130	8	20	
1,3-Dichlorobenzene	0.0444	0.0050	mg/kg wet	0.05000		89	70-130	8	20	
1,3-Dichloropropane	0.0499	0.0050	mg/kg wet	0.05000		100	70-130	0.9	20	
1,4-Dichlorobenzene	0.0449	0.0050	mg/kg wet	0.05000		90	70-130	7	20	
1,4-Dioxane	0.932	0.100	mg/kg wet	1.000		93	70-130	0.6	20	
2,2-Dichloropropane	0.0527	0.0050	mg/kg wet	0.05000		105	70-130	1	20	
2-Butanone	0.250	0.0500	mg/kg wet	0.2500		100	40-160	0.4	20	
2-Chlorotoluene	0.0461	0.0050	mg/kg wet	0.05000		92	70-130	8	20	
2-Hexanone	0.236	0.0500	mg/kg wet	0.2500		94	40-160	0.05	20	
4-Chlorotoluene	0.0458	0.0050	mg/kg wet	0.05000		92	70-130	7	20	
4-Isopropyltoluene	0.0447	0.0050	mg/kg wet	0.05000		89	70-130	9	20	
4-Methyl-2-Pentanone	0.236	0.0500	mg/kg wet	0.2500		94	40-160	0.7	20	
Acetone	0.223	0.0500	mg/kg wet	0.2500		89	40-160	1	20	
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Dependability

Quality

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Service

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Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

Batch DF40102 - 5035 Benzene Bromobenzene	0.0486	Volati	le Organics I	_ow Level					
Batch DF40102 - 5035 Benzene Bromobenzene	0.0486								
Benzene Bromobenzene	0.0486				 				
Bromobenzene	0.0450	0.0050	mg/kg wet	0.05000	97	70-130	0.9	20	
	0.0450	0.0050	mg/kg wet	0.05000	90	70-130	7	20	
Bromochloromethane	0.0475	0.0050	mg/kg wet	0.05000	95	70-130	2	20	
Bromodichloromethane	0.0594	0.0050	mg/kg wet	0.05000	119	70-130	0.2	20	
Bromoform	0.0404	0.0050	mg/kg wet	0.05000	81	40-160	2	20	
Bromomethane	0.0453	0.0100	mg/kg wet	0.05000	91	40-160	1	20	
Carbon Disulfide	0.0531	0.0050	mg/kg wet	0.05000	106	70-130	0.5	20	
Carbon Tetrachloride	0.0549	0.0050	mg/kg wet	0.05000	110	70-130	3	20	
Chlorobenzene	0.0482	0.0050	mg/kg wet	0.05000	96	70-130	1	20	
Chloroethane	0.0465	0.0100	mg/kg wet	0.05000	93	40-160	0.3	20	
Chloroform	0.0514	0.0050	mg/kg wet	0.05000	103	70-130	1	20	
Chloromethane	0.0432	0.0100	ma/ka wet	0.05000	86	40-160	2	20	
cis-1.2-Dichloroethene	0.0495	0.0050	ma/ka wet	0.05000	99	70-130	0.3	20	
cis-1.3-Dichloropropene	0.0531	0.0050	ma/ka wet	0.05000	106	40-160	0.1	20	
Dibromochloromethane	0.0482	0.0050	ma/ka wet	0.05000	96	40-160	0.6	20	
Dibromomethane	0.0512	0.0050	ma/ka wet	0.05000	102	70-130	0.9	20	
Dichlorodifluoromethane	0.0277	0.0100	ma/ka wet	0.05000	55	40-160	7	20	
	0.0516	0.0050	mg/kg wet	0.05000	103	70-130	0.6	20	
Di-isonronyl ether	0.0545	0.0050	mg/kg wet	0.05000	109	70-130	0.5	20	
Ethyl tertiany-butyl ether	0.0515	0.0050	mg/kg wet	0.05000	101	70-130	0.5	20	
	0.0489	0.0050	mg/kg wet	0.05000	98	70-130	1	20	
Hevenhorebutediene	0.0403	0.0050	mg/kg wet	0.05000	80	40-160	2	20	
Isopropulbenzene	0.0509	0.0050	mg/kg wet	0.05000	102	70-130	8	20	
Methyd tert-Butyd Ethor	0.0309	0.0050	mg/kg wet	0.05000	08	70-130	00	20	
Methylana Chlarida	0.0489	0.0050	mg/kg wet	0.05000	20	70-130	0.9	20	
Naphthalana	0.0443	0.0250	mg/kg wet	0.05000	09	/0-150	0.0	20	
	0.0422	0.0050	mg/kg wet	0.05000	04	40-100	4	20	
n-Butyibenzene	0.0470	0.0050	mg/kg wet	0.05000	94	70-130	9	20	
n-Propyidenzene	0.0482	0.0050	mg/kg wet	0.05000	96	70-130	8	20	
sec-Butylbenzene	0.0369	0.0050	mg/kg wet	0.05000	/4	/0-130	9	20	
Styrene	0.0471	0.0050	mg/kg wet	0.05000	94	40-160	2	20	
tert-Butylbenzene	0.0458	0.0050	mg/kg wet	0.05000	92	70-130	9	20	
	0.0497	0.0050	mg/kg wet	0.05000	99	70-130	0.8	20	-
	0.0336	0.0050	mg/kg wet	0.05000	67	70-130	4	20	В-
l etrahydrofuran — ·	0.0494	0.0200	mg/kg wet	0.05000	99	/0-130	2	20	
Toluene	0.0493	0.0050	mg/kg wet	0.05000	99	70-130	0.4	20	
trans-1,2-Dichloroethene	0.0488	0.0050	mg/kg wet	0.05000	98	70-130	2	20	
trans-1,3-Dichloropropene	0.0520	0.0050	mg/kg wet	0.05000	104	70-130	1	20	
	0.0473	0.0050	mg/kg wet	0.05000	95	/0-130	2	20	
Irichlorofluoromethane	0.0492	0.0050	mg/kg wet	0.05000	98	40-160	3	20	
Vinyl Chloride	0.0438	0.0100	mg/kg wet	0.05000	88	70-130	2	20	
Xylene O	0.0497	0.0050	mg/kg wet	0.05000	99	70-130	3	20	
Xylene P,M	0.101	0.0100	mg/kg wet	0.1000	101	70-130	2	20	
Surrogate: 1,2-Dichloroethane-d4	0.0532		mg/kg wet	0.05000	106	70-130			

Dependability

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Quality

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Service



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

				Caril	6		0/ 550			
Analyte	Pocult	MPI	Unite	Spike	Source	%PEC	%REC	חסס	KPD Limit	Qualifier
Analyte	Kesuit	MIKL	Units	Level	Result	70KEU	LIIIIUS	κγD	LIITIIL	Qualifier
		Volati	ile Organics l	low Leve	I					
Batch DF40102 - 5035										
Surrogate: 4-Bromofluorobenzene	0.0498		mg/kg wet	0.05000		100	70-130			
Surrogate: Dibromofluoromethane	0.0518		mg/kg wet	0.05000		104	70-130			
Surrogate: Toluene-d8	0.0510		mg/kg wet	0.05000		102	70-130			
	MADE	P-EPH Extr	ractable Petro	oleum Hy	drocarbo	ns				
Batch DF40411 - 3546										
Blank										
C19-C36 Aliphatics1	ND	15.0	mg/kg wet							
C9-C18 Aliphatics1	ND	15.0	mg/kg wet							
	4.00			2.000		<i>c</i> -	40.4.40			
Surrogate: 1-Chlorooctadecane	1.22		mg/kg wet	2.000		61	40-140			
Blank										
C11-C22 Unadjusted Aromatics1	ND	15.0	mg/kg wet							
Surrogate: 2-Bromonaphthalene	2.09		mg/kg wet	2.000		105	40-140			
Surrogate: 2-Fluorobiphenvl	2.08		mg/kg wet	2.000		104	40-140			
Surrogate: O-Terphenyl	1.86		mg/kg wet	2.000		93	40-140			
Blank										
2-Methylnaphthalene	ND	0.008	mg/kg wet							
Acenaphthene	ND	0.008	mg/kg wet							
Acenaphthylene	ND	0.008	mg/kg wet							
Anthracene	ND	0.008	mg/kg wet							
Benzo(a)anthracene	ND	0.008	mg/kg wet							
Benzo(a)pyrene	ND	0.008	mg/kg wet							
Benzo(b)fluoranthene	ND	0.008	mg/kg wet							
Benzo(g,h,i)perylene	ND	0.008	mg/kg wet							
Benzo(k)fluoranthene	ND	0.008	mg/kg wet							
Chrysene	ND	0.008	mg/kg wet							
Dibenzo(a,h)Anthracene	ND	0.008	mg/kg wet							
Fluoranthene	ND	0.008	mg/kg wet							
Fluorene	ND	0.008	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.008	mg/kg wet							
Naphthalene	ND	0.008	mg/kg wet							
Phenanthrene	ND	0.008	mg/kg wet							
Pyrene	ND	0.008	mg/kg wet							
LCS										
C19-C36 Aliphatics1	14.6	15.0	mg/kg wet	16.00		91	40-140			
C9-C18 Aliphatics1	8.3	15.0	mg/kg wet	12.00		69	40-140			
Surrogate: 1-Chlorooctadecane	1.24		mg/kg wet	2.000		62	40-140			
LCS										
C11-C22 Unadjusted Aromatics1	25.9	15.0	mg/kg wet	34.00		76	40-140			

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Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

				Spike	Source		%REC		RPD	
Analyte	Result	MRL	Units	Level	Result	%REC	Limits	RPD	Limit	Qualifier
	MAD	EP-EPH Ext	ractable Petro	oleum Hy	ydrocarbor	าร				
Batch DF40411 - 3546										
Curragatas 2 Promonanthalana	2.11		ma/ka wet	2.000		106	40-140			
Surrogate: 2-bromonaphinalene	2.09		mg/kg wet	2.000		105	40-140			
Surrogate: 2-FluoroDipitenyi	1.79		mg/kg wet	2.000		89	40-140			
			5, 5							
LCS 2-Methylpaphthalene Breakthrough	0.0		06				0-5			
	0.0		70 0/a				0-5			
	0.0		70				0-5			
LCS										
2-Methylnaphthalene	1.19	0.040	mg/kg wet	2.000		60	40-140			
Acenaphthene	1.40	0.040	mg/kg wet	2.000		70	40-140			
Acenaphthylene	1.46	0.040	mg/kg wet	2.000		73	40-140			
Anthracene	1.65	0.040	mg/kg wet	2.000		83	40-140			
Benzo(a)anthracene	1.40	0.040	mg/kg wet	2.000		70	40-140			
Benzo(a)pyrene	1.59	0.040	mg/kg wet	2.000		/9	40-140			
Benzo(b)fluoranthene	1.40	0.040	mg/kg wet	2.000		70	40-140			
Benzo(g,h,i)perylene	1.41	0.040	mg/kg wet	2.000		/1	40-140			
Benzo(k)fluoranthene	1.60	0.040	mg/kg wet	2.000		80	40-140			
Chrysene	1.64	0.040	mg/kg wet	2.000		82	40-140			
Dibenzo(a,n)Anthracene	1.45	0.040	mg/kg wet	2.000		/3	40-140			
Fluoranthene	1.55	0.040	mg/kg wet	2.000		//	40-140			
Fluorene	1.29	0.040	mg/kg wet	2.000		64	40-140			
Indeno(1,2,3-cd)Pyrene	1.43	0.040	mg/kg wet	2.000		/2	40-140			
Naphthalene	1.36	0.040	mg/kg wet	2.000		68	40-140			
Phenanthrene	1.42	0.040	mg/kg wet	2.000		/1	40-140			
Pyrene	1.69	0.040	mg/kg wet	2.000		84	40-140			
LCS Dup										
C19-C36 Aliphatics1	15.4	15.0	mg/kg wet	16.00		96	40-140	5	25	
C9-C18 Aliphatics1	8.6	15.0	mg/kg wet	12.00		72	40-140	4	25	
Surrogate: 1-Chlorooctadecane	1.28		mg/kg wet	2.000		64	40-140			
LCS Dup										
C11-C22 Unadjusted Aromatics1	27.8	15.0	mg/kg wet	34.00		82	40-140	7	25	
Surrogate: 2-Bromonaphthalene	2.13		mg/kg wet	2.000		106	40-140			
Surrogate: 2-Fluorobiphenyl	2.12		mg/kg wet	2.000		106	40-140			
Surrogate: O-Terphenyl	1.86		mg/kg wet	2.000		93	40-140			
LCS Dup										
2-Methylnaphthalene Breakthrough	0.0		%				0-5		200	
Naphthalene Breakthrough	0.0		%				0-5		200	
2-Methylnaphthalene	1.24	0,040	mg/ka wet	2,000		62	40-140	4	30	
Acenaphthene	1.46	0,040	mg/kg wet	2,000		73	40-140	4	30	
Acenaphthylene	1.53	0,040	mg/ka wet	2,000		76	40-140	4	30	
Anthracene	1.74	0.040	mg/ka wet	2.000		87	40-140	5	30	
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		Dependability	• Qu	ality 4	Servic	: 4400 же	<u>p.//w</u>		aboratory	



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

				Spike	Source		%REC		RPD	
Analyte	Result	MRL	Units	Level	Result	%REC	Limits	RPD	Limit	Qualifier
	MAD	EP-EPH Ext	ractable Petro	leum Hy	drocarbo	ons				
Batch DF40411 - 3546										
Benzo(a)anthracene	1.45	0.040	mg/kg wet	2.000		73	40-140	4	30	
Benzo(a)pyrene	1.75	0.040	mg/kg wet	2.000		88	40-140	10	30	
Benzo(b)fluoranthene	1.43	0.040	mg/kg wet	2.000		72	40-140	2	30	
Benzo(g,h,i)perylene	1.47	0.040	mg/kg wet	2.000		74	40-140	4	30	
Benzo(k)fluoranthene	1.71	0.040	mg/kg wet	2.000		86	40-140	7	30	
Chrysene	1.71	0.040	mg/kg wet	2.000		86	40-140	5	30	
Dibenzo(a,h)Anthracene	1.52	0.040	mg/kg wet	2.000		76	40-140	4	30	
Fluoranthene	1.69	0.040	mg/kg wet	2.000		84	40-140	9	30	
Fluorene	1.32	0.040	mg/kg wet	2.000		66	40-140	3	30	
Indeno(1,2,3-cd)Pyrene	1.49	0.040	mg/kg wet	2.000		74	40-140	4	30	
Naphthalene	1.41	0.040	mg/kg wet	2.000		70	40-140	3	30	
Phenanthrene	1.46	0.040	mg/kg wet	2.000		73	40-140	3	30	
Pyrene	1.69	0.040	mg/kg wet	2.000		85	40-140	0.5	30	
		C	lassical Chem	istry						
Batch DE42956 - General Preparation										
Blank										
Total Organic Carbon (1)	ND	500	mg/kg							
Total Organic Carbon (2)	ND	500	mg/kg							
LCS										
Total Organic Carbon (1)	9070	500	mg/kg	10010		91	80-120			
Total Organic Carbon (2)	9850	500	mg/kg	10010		98	80-120			
LCS Dup										
Total Organic Carbon (1)	10200	500	mg/kg	10010		102	80-120	12	25	
Total Organic Carbon (2)	10300	500	mg/kg	10010		103	80-120	5	25	
	8082	Polychlorina	ated Biphenyl	s (PCB) ,	/ Congen	ers				
Batch DF40311 - 3540C										
Blank										
BZ#101	ND	0.00027	mg/kg wet							
BZ#101 [2C]	ND	0.00027	mg/kg wet							
BZ#105	ND	0.00027	mg/kg wet							
BZ#105 [2C]	ND	0.00027	mg/kg wet							
BZ#118	ND	0.00027	mg/kg wet							
BZ#118 [2C]	ND	0.00027	mg/kg wet							
BZ#128	ND	0.00027	mg/kg wet							
BZ#128 [2C]	ND	0.00027	mg/kg wet							
BZ#138	ND	0.00027	mg/kg wet							
BZ#138 [2C]	ND	0.00027	mg/kg wet							
BZ#153	ND	0.00027	mg/kg wet							
BZ#153 [2C]	ND	0.00027	mg/kg wet							
BZ#170	ND	0.00027	mg/kg wet							
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Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
	8082	Polychlorina	ted Bipheny	ls (PCB)	/ Congene	ers				
Batch DF40311 - 3540C										
BZ#170 [2C]	ND	0.00027	mg/kg wet							
BZ#18	ND	0.00027	mg/kg wet							
BZ#18 [2C]	ND	0.00027	mg/kg wet							
BZ#180	ND	0.00027	mg/kg wet							
BZ#180 [2C]	ND	0.00027	mg/kg wet							
BZ#187	ND	0.00027	mg/kg wet							
BZ#187 [2C]	ND	0.00027	mg/kg wet							
BZ#195	ND	0.00027	mg/kg wet							
BZ#195 [2C]	ND	0.00027	mg/kg wet							
BZ#206	ND	0.00027	mg/kg wet							
BZ#206 [2C]	ND	0.00027	mg/kg wet							
BZ#209	ND	0.00027	ma/ka wet							
BZ#209 [2C]	ND	0.00027	ma/ka wet							
BZ#28	ND	0.00027	ma/ka wet							
BZ#28 [2C]	ND	0.00027	ma/ka wet							
BZ#44	ND	0.00027	ma/ka wet							
BZ#44 [2C]	ND	0.00027	ma/ka wet							
BZ#52	ND	0.00027	ma/ka wet							
B7#52 [2C]	ND	0.00027	ma/ka wet							
B7#66	ND	0.00027	ma/ka wet							
B7#66 [2C]	ND	0.00027	mg/kg wet							
B7#8	ND	0.00027	mg/kg wet							
BZ#8 [2C]	ND	0.00027	mg/kg wet							
Surrogate: Tetrachloro-m-xvlene	0.00211		mg/kg wet	0.003333		63	30-150			
Surrogate' Tetrachloro-m-xylene [2C]	0.00224		mg/kg wet	0.003333		67	30-150			
BZ#101	0.00199	0.00027	ma/ka wet	0.003333		60	40-140			
B7#101 [2C]	0.00205	0.00027	ma/ka wet	0.003333		62	40-140			
B7#105	0.00234	0.00027	ma/ka wet	0.003333		70	40-140			
B7#105 [2C]	0.00239	0.00027	ma/ka wet	0.003333		72	40-140			
B7#118	0.00196	0.00027	ma/ka wet	0.003333		59	40-140			
B7#118 [2C]	0.00216	0.00027	ma/ka wet	0.003333		65	40-140			
BZ#128	0.00235	0.00027	ma/ka wet	0.003333		71	40-140			
B7#128 [2C]	0.00239	0.00027	ma/ka wet	0.003333		72	40-140			
B7#138	0.00210	0.00027	ma/ka wet	0.003333		63	40-140			
BZ#138 [2C]	0.00210	0.00027	mg/kg wet	0.003333		67	40-140			
BZ#153	0.00223	0.00027	mg/kg wet	0.003333		63	40-140			
BZ#153 [2C]	0.00234	0.00027	mg/kg wet	0.003333		70	40-140			
B7#170	0.00210	0.00027	ma/ka wet	0.003333		63	40-140			
BZ#170 [2C]	0.00210	0.00027	ma/ka wet	0.002225		68	40-140			
R7#18	0.00220	0.00027	ma/ka wet	0.003333		50	40-140			
BZ#18 [2C]	0.00190	0.00027	ma/ka wet	0.002225		59	40-140			
R7#180	0.0012	0.00027	ma/ka wet	0.002225		64	40-140			
185 Francos Avonuo, Cr	onston PL 02010	2211 To	I. 401 461 71	01 E	ov: 101 16	1 1/96	http://w		aboratory	

Dependability

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Quality

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Service



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

Batch DF40311 - 3540C 3Z#180 [2C] 3Z#187 3Z#187 [2C] 3Z#195 3Z#195 [2C] 3Z#206 3Z#206 3Z#206 [2C] 3Z#209 3Z#209 [2C]	Result 0.00244 0.00203 0.00211 0.00216 0.00221 0.00221 0.00221	0.00027 0.00027 0.00027 0.00027 0.00027	mg/kg wet mg/kg wet mg/kg wet	0.003333 0.003333	Kesuit Congene	%KEC 2rs 73	40-140	KYU	Limit	
Batch DF40311 - 3540C BZ#180 [2C] BZ#187 BZ#187 [2C] 3Z#195 3Z#195 [2C] 3Z#206 SZ#206 [2C] 3Z#209 SZ#209 [2C]	0.00244 0.00203 0.00211 0.00216 0.00239 0.00221 0.00221	0.00027 0.00027 0.00027 0.00027 0.00027	mg/kg wet mg/kg wet mg/kg wet	0.003333 0.003333	Congene	73	40-140			
Batch DF40311 - 3540C BZ#180 [2C] BZ#187 [2C] BZ#187 [2C] BZ#195 [2C] SZ#195 [2C] SZ#206 [2C] SZ#209 [2C] SZ#209 [2C]	0.00244 0.00203 0.00211 0.00216 0.00239 0.00221	0.00027 0.00027 0.00027 0.00027	mg/kg wet mg/kg wet mg/kg wet	0.003333		73	40-140			
BZ#180 [2C] BZ#187 BZ#187 [2C] BZ#195 BZ#195 [2C] 3Z#206 BZ#206 [2C] 3Z#209 3Z#209 [2C]	0.00244 0.00203 0.00211 0.00216 0.00239 0.00221	0.00027 0.00027 0.00027 0.00027	mg/kg wet mg/kg wet mg/kg wet	0.003333		73	40-140			
BZ#187 BZ#187 [2C] BZ#195 BZ#195 [2C] 3Z#206 BZ#206 [2C] 3Z#209 3Z#209 [2C]	0.00203 0.00211 0.00216 0.00239 0.00221	0.00027 0.00027 0.00027	mg/kg wet mg/kg wet	0.003333			•			
BZ#187 [2C] BZ#195 BZ#195 [2C] BZ#206 BZ#206 [2C] BZ#209 BZ#209 [2C]	0.00211 0.00216 0.00239 0.00221	0.00027	mg/kg wet			61	40-140			
BZ#195 BZ#195 [2C] BZ#206 3Z#206 [2C] 3Z#209 [2C]	0.00216 0.00239 0.00221	0.00027		0.003333		63	40-140			
BZ#195 [2C] BZ#206 BZ#206 [2C] 3Z#209 BZ#209 [2C]	0.00239	0 00007	mg/kg wet	0.003333		65	40-140			
BZ#206 BZ#206 [2C] 3Z#209 3Z#209 [2C]	0.00221	0.00027	mg/kg wet	0.003333		72	40-140			
8Z#206 [2C] 8Z#209 3Z#209 [2C]	0.00225	0.00027	mg/kg wet	0.003333		66	40-140			
3Z#209 3Z#209 [2C]	0.00235	0.00027	mg/kg wet	0.003333		70	40-140			
BZ#209 [2C]	0.00205	0.00027	mg/kg wet	0.003333		61	40-140			
27/00	0.00231	0.00027	mg/kg wet	0.003333		69	40-140			
32#28	0.00204	0.00027	mg/kg wet	0.003333		61	40-140			
BZ#28 [2C]	0.00222	0.00027	mg/kg wet	0.003333		67	40-140			
BZ#44	0.00188	0.00027	mg/kg wet	0.003333		56	40-140			
BZ#44 [2C]	0.00197	0.00027	mg/kg wet	0.003333		59	40-140			
BZ#52	0.00185	0.00027	mg/kg wet	0.003333		56	40-140			
BZ#52 [2C]	0.00196	0.00027	mg/kg wet	0.003333		59	40-140			
BZ#66	0.00198	0.00027	mg/kg wet	0.003333		59	40-140			
BZ#66 [2C]	0.00220	0.00027	ma/ka wet	0.003333		66	40-140			
BZ#8	0.00197	0.00027	ma/ka wet	0.003333		59	40-140			
BZ#8 [2C]	0.00231	0.00027	ma/ka wet	0.003333		69	40-140			
			5, 5							
Surrogate: Tetrachloro-m-xylene	0.00204		mg/kg wet	0.003333		61	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.00213		mg/kg wet	0.003333		64	30-150			
LCS Dup										
3Z#101	0.00217	0.00027	mg/kg wet	0.003333		65	40-140	9	30	
BZ#101 [2C]	0.00221	0.00027	mg/kg wet	0.003333		66	40-140	8	30	
BZ#105	0.00247	0.00027	mg/kg wet	0.003333		74	40-140	5	30	
BZ#105 [2C]	0.00254	0.00027	mg/kg wet	0.003333		76	40-140	6	30	
BZ#118	0.00210	0.00027	mg/kg wet	0.003333		63	40-140	7	30	
BZ#118 [2C]	0.00235	0.00027	mg/kg wet	0.003333		70	40-140	8	30	
BZ#128	0.00239	0.00027	mg/kg wet	0.003333		72	40-140	2	30	
BZ#128 [2C]	0.00260	0.00027	mg/kg wet	0.003333		78	40-140	9	30	
BZ#138	0.00224	0.00027	mg/kg wet	0.003333		67	40-140	6	30	
BZ#138 [2C]	0.00243	0.00027	mg/kg wet	0.003333		73	40-140	8	30	
BZ#153	0.00226	0.00027	mg/kg wet	0.003333		68	40-140	7	30	
BZ#153 [2C]	0.00257	0.00027	mg/kg wet	0.003333		77	40-140	9	30	
BZ#170	0.00231	0.00027	mg/kg wet	0.003333		69	40-140	10	30	
BZ#170 [2C]	0.00248	0.00027	mg/kg wet	0.003333		74	40-140	9	30	
BZ#18	0.00208	0.00027	mg/kg wet	0.003333		62	40-140	6	30	
BZ#18 [2C]	0.00200	0.00027	ma/ka wet	0.003333		60	40-140	3	30	
BZ#180	0.00233	0.00027	ma/ka wet	0.003333		70	40-140	9	30	
BZ#180 [2C]	0.00257	0.00027	ma/ka wet	0.003333		77	40-140	5	30	
BZ#187	0.00216	0.00027	ma/ka wet	0.003333		65	40-140	6	30	
BZ#187 [2C]	0.00227	0.00027	ma/ka wet	0.003333		68	40-140	7	30	
8Z#195	0.00248	0.00027	ma/ka wet	0.003333		74	40-140	14	30	
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Dependability

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Quality

Service

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Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Quality Control Data

				Spike	Source		%REC		RPD	
Analyte	Result	MRL	Units	Level	Result	%REC	Limits	RPD	Limit	Qualifier
	8082	Polychlorina	ated Bipheny	/ls (PCB) ,	/ Congen	ers				
Batch DF40311 - 3540C										
BZ#195 [2C]	0.00261	0.00027	mg/kg wet	0.003333		78	40-140	9	30	
BZ#206	0.00239	0.00027	mg/kg wet	0.003333		72	40-140	8	30	
BZ#206 [2C]	0.00255	0.00027	mg/kg wet	0.003333		77	40-140	8	30	
BZ#209	0.00227	0.00027	mg/kg wet	0.003333		68	40-140	10	30	
BZ#209 [2C]	0.00249	0.00027	mg/kg wet	0.003333		75	40-140	8	30	
BZ#28	0.00208	0.00027	mg/kg wet	0.003333		62	40-140	2	30	
BZ#28 [2C]	0.00236	0.00027	mg/kg wet	0.003333		71	40-140	6	30	
BZ#44	0.00201	0.00027	mg/kg wet	0.003333		60	40-140	7	30	
BZ#44 [2C]	0.00214	0.00027	mg/kg wet	0.003333		64	40-140	8	30	
BZ#52	0.00200	0.00027	mg/kg wet	0.003333		60	40-140	8	30	
BZ#52 [2C]	0.00210	0.00027	mg/kg wet	0.003333		63	40-140	7	30	
BZ#66	0.00213	0.00027	mg/kg wet	0.003333		64	40-140	7	30	
BZ#66 [2C]	0.00240	0.00027	mg/kg wet	0.003333		72	40-140	9	30	
BZ#8	0.00217	0.00027	mg/kg wet	0.003333		65	40-140	9	30	
BZ#8 [2C]	0.00245	0.00027	mg/kg wet	0.003333		74	40-140	6	30	
Surrogate: Tetrachloro-m-xylene	0.00219		mg/kg wet	0.003333		66	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.00228		mg/kg wet	0.003333		68	30-150			



BAL Laboratory 🗯

Analytical Balance 🗯

CERTIFICATE OF ANALYSIS

Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

Notes and Definitions

Z-08	See Attached
U	Analyte included in the analysis, but not detected
Р	Percent difference between primary and confirmation results exceeds 40% (P).
LC	Lower value is used due to matrix interferences (LC).
EL	Elevated Method Reporting Limits due to sample matrix (EL).
D	Diluted.
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
B-	Blank Spike recovery is below lower control limit (B-).
ND	Analyte NOT DETECTED at or above the MRL (LOO), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	
F/V	Final volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of larger analytes eluting in that range.
3 Ava	Range result excludes the concentration of the C9-C10 aromatic range.
NR	Results reported as a mathematical average. No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit
MF	Membrane Filtration
MPN	Most Probable Number
TNTC	Too numerous to Count
CFU	Colony Forming Units



Client Name: Environmental Partners Group, LLC Client Project ID: North Lake Cochichewick Boat Launch

ESS Laboratory Work Order: 24E1224

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179 http://www.health.ri.gov/find/labs/analytical/ESS.pdf

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750 http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

> Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002 http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/partners/labCert.shtml

> > Massachusetts Potable and Non Potable Water: M-RI002 http://public.dep.state.ma.us/Labcert/Labcert.aspx

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424 http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313 http://www.wadsworth.org/labcert/elap/comm.html

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006 http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

> Pennsylvania: 68-01752 http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx

	195 Frances Avenue	Client In	formation:	Project li	nformation:		
	Cranston RI, 02910	Environmental	Partners Group	North Lake Cochie	chewick Boat Launch		
Thiolsch	Phone: (401)-467-6454	Quin	cy, MA	North Andover, MA			
	Fax: (401)-467-2398	Project Manager:	Ryan Paul	Project Number:	24E1224		
DIVISION OF THE RISE GROUP	cts.thielsch.com	Assigned By:	ESS Laboratory	Summary Page:	1 of 1		
	Let's Build a Solid Foundation	Collected By:	Client	Report Date:	06.07.24		

LABORATORY TESTING DATA SHEET, Report No.: 7424-F-105

							Ide	ntificatio	n Tests				Proctor / CBR / Permeability Tests								
Material Source	Sample ID	Depth (ft)	Laboratory No.	As Rcvd Moisture Content %	LL %	PL %	OD LL	Gravel %	Sand %	Fines %	Org. %	рН	g _d <u>MAX (pcf)</u> W _{opt} (%)	g _d <u>MAX (pcf)</u> W _{opt} (%) (Corr.)	Dry unit wt. (pcf)	Test Moisture Content %	Target Test Setup as % of Proctor	CBR @ 0.1"	CBR @ 0.2"	Permeability cm/sec	Laboratory Log and Soil Description
				D2216	D4	318			D6913		D2974	D4792	D1	557		-	1	1	1		
Field Sample	S-1	-	24E1224-01					30.3	60.6	9.1											Dark Brown poorly graded sand with silt and gravel
Field Sample	S-2	-	24E1224-02					27.3	63.5	9.2											Dark Brown poorly graded sand with silt and gravel

Date Received:

06.03.24

Reviewed By:

fifthe

Date Reviewed:

06.07.24

This report only relates to items inspect and/or tested. No warranty, expressed or implied, is made. This report shall not be reproduced, except in full, without prior written approval from the Agency, as defined in ASTM E329.



Checked By: Rebecca Roth



Checked By: Rebecca Roth



DREDGING AND DISPOSAL OPERATIONS PLAN

The dredged material will be disposed off-site in accordance with the Massachusetts Bureau of Waste Prevention (BWP) Policy #BWP-94-037, MassDEP water quality certification (WQC) of dredging projects under 314 CMR 9.00, and Interim Policy COMM-94-007: Dredged Sediment Reuse or Disposal.

A Soil Management Plan (SMP) shall be submitted by the Contractor to manage excavated material that will be generated as part of the North Lake Cochichewick Boat Launch project in North Andover, MA. The SMP shall be submitted to the Owner or Engineer and/or their representative for review and approval at least three weeks prior to beginning any intrusive work at the site. The SMP shall outline measures for sampling, field screening, laboratory analysis, and disposal/ off-site reuse of soils and wastes generated at the Project site. Additional soil management will be guided by the Project Specifications to be prepared by Environmental Partners as part of the final Contract Documents.

It is expected that approximately 63 cubic yards of material will be dredged from Lake Cochichewick for the construction of the new hand carry boat launch, block retaining wall, and associated work. The excavated material will either be stockpiled on and covered by polyethylene sheeting, and/or directly loaded into lined and covered roll-off dumpsters and allowed to dewater. Stockpiled materials that are to be disposed of shall remain on-site for only as long as it would reasonably take to characterize, load and transport off-site to an approved disposal facility. The appropriate sediment and free water management practices shall be implemented around the stockpile/dumpsters to prevent migrations.

Sediment samples were collected during the due diligence review. The sediment sample laboratory results, provided with this electronic submission, indicated the presence of various chemical compounds generally associated with background anthropogenic sources, including heavy metals, petroleum hydrocarbons, and polycyclic aromatic hydrocarbons (PAHs). Final waste characterization samples will be collected at the time that sediment is dredged; approval will be obtained from the BWP as necessary based upon these results; and the material disposed of in accordance with local, state, and federal regulations.

The required testing to characterize sediment for disposal or reuse at landfills is described below and includes the following tests:

- Total organic compounds (TOVs) Analysis
- Volatile organic compounds (VOCs) Analysis
- Sediment Analysis for parameters listed under 314 CMR 9.07(2)(b)6; and
- EPA Paint Filter Test (Method 9095) as applicable.

The estimated volume of sediment for this project is less than 100 cubic yards, therefore one composite sample (consisting of three separate grab samples) will be required to properly characterize the sediment for off-site disposal. Each grab sample will be screened for total organic compounds (TOVs) using a photoionization detector (PID) calibrated to an isobutylene reference with a response factor of 1. The sediment sample will be analyzed by a state certified laboratory for arsenic, total petroleum hydrocarbons (TPHs), volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs) and toxicity characteristic leaching procedure (TCLP) if applicable. The grab sample depicting the highest PID reading will be analyzed for VOCs. A paint filter test by EPA Method 9095 may be required to determine that the sediment is free of liquid prior to transportation.

After analytical results are available, the excavated material shall be handled in accordance with the type and degree of contamination (if any) present in the sediment, and recommendations of the Contractor's qualified environmental professional (LSP).

The potentially stockpiled material shall be separated as described below:

<u>Non-Contaminated Material:</u> Excavated material that that is not suspected or observed to be potentially contaminated or obviously contaminated and passing the classification criteria described above shall be managed as Non-Contaminated and may be used for reuse on-site or exported to another similar soils site in accordance with local, state, and federal regulations.

Potentially Contaminated and Contaminated Material: Sediment which contains either petroleum or chemical odor or visual indications of oil or hazardous materials shall be handled as potentially contaminated. Contaminated soils requiring off-site transportation and reuse/disposal or recycling shall be transported using a Material Shipping Record (MSR) or Bill of Lading (BOL), as appropriate. Sediment that meets all applicable criteria (i.e., COMM 97-001 and/or facility-specific permit requirements) for off-site reuse as daily cover or grading material can be accepted at an unlined landfill as long as the unlined landfill is permitted as such. If sediments exceed one or more of the established contaminant limits listed in COMM-94-007, then the applicant will need to obtain individual BWP review and approval for sediment reuse at a lined landfill.

The following are the acceptable levels at a lined landfill per COMM-94-007:

Table 1: Maximum Allowable Contaminant Levels for Sediment Reuse at Lined Landfills

Contaminant (a)	Reuse Levels
Total Arsenic	40
Total Cadmium	80
Total Chromium	1,000

Contaminant (a)	Reuse Levels
Total Lead	2,000
Total Mercury	10
Total Petroleum Hydrocarbons (TPH)	5,000
Total PBCs (b)	< 2
Total PAHs (c)	100
Total VOCs (d)	10
Listed or Characteristic Hazardous Waste (TCLP) (e)	none

Notes:

- 1. Contaminant concentrations are in mg/kg, dry weight.
- 2. Total concentrations of polychlorinated biphenyls listed in EPA Method 8080.
- 3. Total concentrations of polynuclear aromatic hydrocarbons listed in EPA Method 8100.
- 4. Total concentrations of volatile organic compounds listed in EPA Method 8240 or equivalent.
- TCLP testing should be performed for metals or organic compounds when the total concentrations in the sediments are above the theoretical levels at which the TCLP criteria may be met or exceeded. For the above metals such levels (mg/kg) are: As > 100, Cd > 20, Cr > 100, Pb > 100, Hg > 4.

Appendix C

State and Local Permits

North Andover Order of Conditions (OOC) North Andover Watershed Special Permit (WSP) MESA Determination Letter and Consultation Update Secretary's Certificate on the Single Environmental Impact Report (EIR) USACE Pre-Construction Notification (PCN) 401 Water Quality Certification (WQC) Ch 91 License (Placeholder- to be provided prior to construction mobilization) [THIS PAGE IS INTENTIONALLY LEFT BLANK]



Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands

Provided by MassDEP: 242-1900 MassDEP File #

WPA Form 5 – Order of Conditions Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

eDEP Transaction # North Andover City/Town

A. General Information

Please note: this form has been modified	1. From:	North Andover Conservation Commiss	ion				
with added space to accommodate	2. This issue (check of	ance is for ne):	a. 🔀 Order	of Condition	ons b. 🗌 Am	ended Orde	er of Conditions
of Deeds Requirements	з. То: Ар	olicant:			-		
	John				Borgesi, Town E	ngineer	
Important:	a. First N	ame			b. Last Name		
When filling	Town o	f North Andover, DI	PW				
out forms on	c. Organi	zation					
computer.	384 Os	good Street					
use only the	d. Mailing	Address					
tab key to	North A	ndover			MA		01845
cursor - do	e. City/10	nwo			f. State		g. Zip Code
not use the return key.	4. Property	Owner (if different f	rom applica	int):			
(w)	a. First N	ame			b. Last Name		
return X	c. Organi	zation					
	d. Mailing	g Address					
	e. City/To	own			f. State		g. Zip Code
	5. Project Lo	ocation:					
	0 Great	Pond Road (acros	s from 1939)	North Andover		
	Great F	Pond Road)		1	b. City/Town		
	Map 35				Lot 21		
	c. Assess	sors Map/Plat Number		1	d. Parcel/Lot Number	r	
	Latitude	e and Longitude, if I	nown:	1m4537s 71d11m2686s			
				d. Latitude		e. Longitud	е



WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: 242-1900 MassDEP File #

eDEP Transaction # North Andover City/Town

A. General Information (cont.)

 Property recorded at the Registry of Deeds for (attach additional information if more than one parcel):

	Northern	Essex			
	a. County		b. Certificate Number (if registered land)		
	689		147		
	c. Book		d. Page		
	Deter	July 31, 2024	December 11, 2024	December 13, 2024	
1.	Dates.	a. Date Notice of Intent Filed	b. Date Public Hearing Closed	c. Date of Issuance	

8. Final Approved Plans and Other Documents (attach additional plan or document references as needed):

a. Plan Title	
Environmental Partners (Apex)	Ryan Paul, PE
b. Prepared By	c. Signed and Stamped by
December 5, 2024	as shown
d. Final Revision Date	e. Scale
See attached list of other approved doc	uments
f. Additional Plan or Document Title	g. Date

B. Findings

1. Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this Commission finds that the areas in which work is proposed is significant to the following interests of the Wetlands Protection Act (the Act). Check all that apply:

a.	\boxtimes	Public Water Supply	b.		Land Containing Shellfish	C.	Prevention of Pollution
d.	\boxtimes	Private Water Supply	e.	\boxtimes	Fisheries	f.	Protection of Wildlife Habitat
g.	\boxtimes	Groundwater Supply	h.	\boxtimes	Storm Damage Prevention	i.	Flood Control

2. This Commission hereby finds the project, as proposed, is: (check one of the following boxes)

Approved subject to:

a. A the following conditions which are necessary in accordance with the performance standards set forth in the wetlands regulations. This Commission orders that all work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.

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WPA Form 5 – Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP: 242-1900 MassDEP File #

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B. Findings (cont.)

Denied because:

- b. The proposed work cannot be conditioned to meet the performance standards set forth in the wetland regulations. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect the interests of the Act, and a final Order of Conditions is issued. A description of the performance standards which the proposed work cannot meet is attached to this Order.
- c. I the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(6)(c).
- Buffer Zone Impacts: Shortest distance between limit of project disturbance and the wetland resource area specified in 310 CMR 10.02(1)(a)
 a. linear feet

Inland Resource Area Impacts: Check all that apply below. (For Approvals Only)

Resource Area		Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
4.	Bank	202	202 h. linear fast	202	202
5		a. Inical leet	D. Inteat leet	c. inteat teet	u. Illical leet
5.	Vegetated Wetland	a. square feet	b. square feet	c. square feet	d. square feet
6.	Land Under	4,838	4,838	5,075	5,075
	Waterbodies and	a. square feet	b. square feet	c. square feet	d. square feet
	Waterways	63	63		
		e. c/y dredged	f. c/y dredged		
7.	Bordering Land	1,540	1,540	1,540	1,540
	Subject to Flooding	a. square feet	b. square feet	c. square feet	d. square feet
	Cubic Foot Flood Storage			396.5	396.5
	Cubic Feel Flood Storage	e. cubic feet	f. cubic feet	created	h. cubic feet
8.	Isolated Land				
	Subject to Flooding	a. square feet	b. square feet		
	Cubic Feet Flood Storage	c. cubic feet	d. cubic feet	e. cubic feet	f. cubic feet
9.	Riverfront Area	a. total sq. feet	b. total sq. feet		
	Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
	Sq ft between 100- 200 ft	g. square feet	h. square feet	i. square feet	j. square feet



WPA Form 5 – Order of Conditions Massachusetts Wetlands Protection Act M.G.L. c. 131, §40 Provided by MassDEP: 242-1900 MassDEP File #

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B. Findings (cont.)

Coastal Resource Area Impacts: Check all that apply below. (For Approvals Only)

		Proposed Alteration	Permitted Alteration	Proposed Replacement	Permitted Replacement
10.	Designated Port Areas	Indicate size un	der Land Under	the Ocean, belo	w
11.	Land Under the Ocean	a. square feet	b. square feet		
		c. c/y dredged	d. c/y dredged		
12.	Barrier Beaches	Indicate size un below	der Coastal Bea	aches and/or Coa	stal Dunes
13.	Coastal Beaches	a annuar faat	h anuara fast	cu yd	cu yd
		a. square reet	b. square leet	c. nourishment	a. nourishment
14.	Coastal Dunes	a. square feet	b. square feet	c. nourishment	d. nourishment
15.	Coastal Banks	a. linear feet	b. linear feet		
16.	Rocky Intertidal				
	Shores	a. square feet	b. square feet		
17.	Salt Marshes	a. square feet	b. square feet	c. square feet	d. square feet
18.	Land Under Salt				
	Ponds	a. square feet	b. square feet		
		c. c/y dredged	d. c/y dredged		
19.	Land Containing		9 	<u>.</u>	
	Shellfish	a. square feet	b. square feet	c. square feet	d. square feet
20.	Fish Runs	Indicate size un the Ocean, and Waterways, abo	ider Coastal Bar /or inland Land ove	nks, Inland Bank, Under Waterbodi	Land Under es and
		a. c/y dredged	b. c/y dredged		
21.	Land Subject to Coastal Storm Flowage	a. square feet	b. square feet		
22.	Riverfront Area	a. total sq. feet	b. total sq. feet		
	Sq ft within 100 ft	c. square feet	d. square feet	e. square feet	f. square feet
	Sq ft between 100- 200 ft	g. square feet	h. square feet	i. square feet	j. square feet

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B. Findings (cont.)

a. square feet of BVW

* #23. If the 23. Restoration/Enhancement *: project is for the purpose of restoring or enhancing a wetland resource area 2 in addition to the square footage that has been entered in Section B.5.c (BVW) or B.17.c (Salt Marsh) above, 1. please enter the additional

	a. number of new stream crossings	b. number of replacement stream crossings
4.	Stream Crossing(s):	

b. square feet of salt marsh

C. General Conditions Under Massachusetts Wetlands Protection Act

The following conditions are only applicable to Approved projects.

- Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
- amount here. 2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
 - This Order does not relieve the permittee or any other person of the necessity of complying 3. with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations,
 - The work authorized hereunder shall be completed within three years from the date of this 4. Order unless either of the following apply:
 - a. The work is a maintenance dredging project as provided for in the Act; or
 - b. The time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
 - c. If the work is for a Test Project, this Order of Conditions shall be valid for no more than one year.
 - 5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order. An Order of Conditions for a Test Project may be extended for one additional year only upon written application by the applicant, subject to the provisions of 310 CMR 10.05(11)(f).
 - 6. If this Order constitutes an Amended Order of Conditions, this Amended Order of Conditions does not extend the issuance date of the original Final Order of Conditions and the Order will expire on _____ unless extended in writing by the Department.
 - 7. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.



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C. General Conditions Under Massachusetts Wetlands Protection Act

- This Order is not final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
- 9. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of the registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to the Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of work.
- 10. A sign shall be displayed at the site not less then two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection" [or, "MassDEP"]

"File Number 242-1900

- 11. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before MassDEP.
- 12. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
- 13. The work shall conform to the plans and special conditions referenced in this order.
- 14. Any change to the plans identified in Condition #13 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.
- 15. The Agent or members of the Conservation Commission and the Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.
- This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.


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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- 17. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall be maintained until a Certificate of Compliance has been issued by the Conservation Commission.
- 18. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary. Sedimentation barriers shall serve as the limit of work unless another limit of work line has been approved by this Order.
- 19. The work associated with this Order (the "Project")
 - (1) is subject to the Massachusetts Stormwater Standards
 - (2) is NOT subject to the Massachusetts Stormwater Standards

If the work is subject to the Stormwater Standards, then the project is subject to the following conditions:

a) All work, including site preparation, land disturbance, construction and redevelopment, shall be implemented in accordance with the construction period pollution prevention and erosion and sedimentation control plan and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Construction General Permit as required by Stormwater Condition 8. Construction period erosion, sedimentation and pollution control measures and best management practices (BMPs) shall remain in place until the site is fully stabilized.

b) No stormwater runoff may be discharged to the post-construction stormwater BMPs unless and until a Registered Professional Engineer provides a Certification that:

i. all construction period BMPs have been removed or will be removed by a date certain specified in the Certification. For any construction period BMPs intended to be converted to post construction operation for stormwater attenuation, recharge, and/or treatment, the conversion is allowed by the MassDEP Stormwater Handbook BMP specifications and that the BMP has been properly cleaned or prepared for post construction operation, including removal of all construction period sediment trapped in inlet and outlet control structures; *ii.* as-built final construction BMP plans are included, signed and stamped by a Registered Professional Engineer, certifying the site is fully stabilized;

iii. any illicit discharges to the stormwater management system have been removed, as per the requirements of Stormwater Standard 10;



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C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

iv. all post-construction stormwater BMPs are installed in accordance with the plans (including all planting plans) approved by the issuing authority, and have been inspected to ensure that they are not damaged and that they are in proper working condition;

v. any vegetation associated with post-construction BMPs is suitably established to withstand erosion.

c) The landowner is responsible for BMP maintenance until the issuing authority is notified that another party has legally assumed responsibility for BMP maintenance. Prior to requesting a Certificate of Compliance, or Partial Certificate of Compliance, the responsible party (defined in General Condition 18(e)) shall execute and submit to the issuing authority an Operation and Maintenance Compliance Statement ("O&M Statement) for the Stormwater BMPs identifying the party responsible for implementing the stormwater BMP Operation and Maintenance Plan ("O&M Plan") and certifying the following:

i.) the O&M Plan is complete and will be implemented upon receipt of the Certificate of Compliance, and

ii.) the future responsible parties shall be notified in writing of their ongoing legal responsibility to operate and maintain the stormwater management BMPs and implement the Stormwater Pollution Prevention Plan.

d) Post-construction pollution prevention and source control shall be implemented in accordance with the long-term pollution prevention plan section of the approved Stormwater Report and, if applicable, the Stormwater Pollution Prevention Plan required by the National Pollution Discharge Elimination System Multi-Sector General Permit.

e) Unless and until another party accepts responsibility, the landowner, or owner of any drainage easement, assumes responsibility for maintaining each BMP. To overcome this presumption, the landowner of the property must submit to the issuing authority a legally binding agreement of record, acceptable to the issuing authority, evidencing that another entity has accepted responsibility for maintaining the BMP, and that the proposed responsible party shall be treated as a permittee for purposes of implementing the requirements of Conditions 18(f) through 18(k) with respect to that BMP. Any failure of the proposed responsible party to implement the requirements of Conditions 18(f) through 18(k) with respect to that BMP shall be a violation of the Order of Conditions or Certificate of Compliance. In the case of stormwater BMPs that are serving more than one lot, the legally binding agreement shall also identify the lots that will be serviced by the stormwater BMPs. A plan and easement deed that grants the responsible party access to perform the required operation and maintenance must be submitted along with the legally binding agreement.

f) The responsible party shall operate and maintain all stormwater BMPs in accordance with the design plans, the O&M Plan, and the requirements of the Massachusetts Stormwater Handbook.



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North Andover City/Town

C. General Conditions Under Massachusetts Wetlands Protection Act (cont.)

- g) The responsible party shall:
 - Maintain an operation and maintenance log for the last three (3) consecutive calendar years of inspections, repairs, maintenance and/or replacement of the stormwater management system or any part thereof, and disposal (for disposal the log shall indicate the type of material and the disposal location);
 - 2. Make the maintenance log available to MassDEP and the Conservation Commission ("Commission") upon request; and
 - Allow members and agents of the MassDEP and the Commission to enter and inspect the site to evaluate and ensure that the responsible party is in compliance with the requirements for each BMP established in the O&M Plan approved by the issuing authority.

h) All sediment or other contaminants removed from stormwater BMPs shall be disposed of in accordance with all applicable federal, state, and local laws and regulations.

i) Illicit discharges to the stormwater management system as defined in 310 CMR 10.04 are prohibited.

j) The stormwater management system approved in the Order of Conditions shall not be changed without the prior written approval of the issuing authority.

k) Areas designated as qualifying pervious areas for the purpose of the Low Impact Site Design Credit (as defined in the MassDEP Stormwater Handbook, Volume 3, Chapter 1, Low Impact Development Site Design Credits) shall not be altered without the prior written approval of the issuing authority.

 Access for maintenance, repair, and/or replacement of BMPs shall not be withheld. Any fencing constructed around stormwater BMPs shall include access gates and shall be at least six inches above grade to allow for wildlife passage.

Special Conditions (if you need more space for additional conditions, please attach a text document):

20. For Test Projects subject to 310 CMR 10.05(11), the applicant shall also implement the monitoring plan and the restoration plan submitted with the Notice of Intent. If the conservation commission or Department determines that the Test Project threatens the public health, safety or the environment, the applicant shall implement the removal plan submitted with the Notice of Intent or modify the project as directed by the conservation commission or the Department.

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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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D. Findings Under Municipal Wetlands Bylaw or Ordinance

- Is a municipal wetlands bylaw or ordinance applicable? Xes INO
- 2. The North Andover hereby finds (check one that applies): Conservation Commission
 - a. I that the proposed work cannot be conditioned to meet the standards set forth in a municipal ordinance or bylaw, specifically:

1. Municipal Ordinance or Bylaw

2. Citation

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

 b. X that the following additional conditions are necessary to comply with a municipal ordinance or bylaw: North Andover Wetlands Protection Bylaw & Regulations
 Chap. 190

North Andover Wetlands Protection Bylaw & Regulations	Chap. 190
. Municipal Ordinance or Bylaw	et. seq.

3. The Commission orders that all work shall be performed in accordance with the following conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

The special conditions relating to municipal ordinance or bylaw are as follows (if you need more space for additional conditions, attach a text document):

North Andover Conservation Commission Findings & Special Conditions (see attached)



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Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

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E. Signatures

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

Please indicate the number of members who will sign this form. This Order must be signed by a majority of the Conservation Commission.

12 -13 - 24 1. Date of Issuance 2. Number of Signers

The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate Department of Environmental Protection Regional Office, if not filing electronically, and the property owner, if different from applicant.

Sal /	LUUIS NAPOL
signature	SEAN MODONOUGH
ilgnature	Printed Name BRADLEY NUSTAIN
lignature	Printed Name
signature NL+MM	Printed Name
signature	Printed Name
signature	Printed Name
ignature	Printed Name
ignature	Printed Name
by hand delivery on	by certified mail, return receipt requested, on
12-13-24	



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F. Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate MassDEP Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the Conservation Commission and to the applicant, if he/she is not the appellant.

Any appellants seeking to appeal the Department's Superseding Order associated with this appeal will be required to demonstrate prior participation in the review of this project. Previous participation in the permit proceeding means the submission of written information to the Conservation Commission prior to the close of the public hearing, requesting a Superseding Order, or providing written information to the Department prior to issuance of a Superseding Order.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, § 40), and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal ordinance or bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department has no appellate jurisdiction.

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G. Recording Information

Prior to commencement of work, this Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information on this page shall be submitted to the Conservation Commission listed below.

Conservation Commission	
Detach on dotted line, have stamped Commission.	d by the Registry of Deeds and submit to the Conservation
To:	
North Andover	
Conservation Commission	
Please be advised that the Order of	f Conditions for the Project at:
0 Great Pond Road	242-1900
Project Location	MassDEP File Number
Has been recorded at the Registry	of Deeds of:
Northern Essex	
County	Book Page
for:	to John Borgesi, Town Engineer DPW
Property Owner	
and has been noted in the chain of	title of the affected property in:
and has been noted in the chain of	title of the affected property in:
and has been noted in the chain of 689 Book	title of the affected property in:
and has been noted in the chain of 689 Book	title of the affected property in:
and has been noted in the chain of <u>689</u> Book In accordance with the Order of Con 12-13-24	title of the affected property in:
and has been noted in the chain of 689 Book In accordance with the Order of Col 12-13-24 Date	title of the affected property in:
and has been noted in the chain of <u>689</u> Book In accordance with the Order of Con <u>12-13-24</u> Date If recorded land, the instrument nur	title of the affected property in: 147 Page nditions issued on: mber identifying this transaction is:
and has been noted in the chain of <u>689</u> Book In accordance with the Order of Col <u>12-13-24</u> Date If recorded land, the instrument nur Instrument Number	title of the affected property in: 147 Page nditions issued on: mber identifying this transaction is:
Property Owner and has been noted in the chain of <u>689</u> Book In accordance with the Order of Con <u>12-13-24</u> Date If recorded land, the instrument nur Instrument Number	title of the affected property in: <u>147</u> Page nditions issued on: mber identifying this transaction is:

Document Number

Signature of Applicant

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Findings of Fact

<u>Current Project Site Conditions</u>: The North Lake Cochichewick Boat Launch (boat launch) is located on the northern end of Lake Cochichewick, directly across from house #1939 Great Pond Road in North Andover, MA. The Town-owned site occupies the former extents of the North Sewer Pump Station that has since been demolished. The current configuration of the boat launch site includes a paved driveway apron, a dirt/gravel driveway, lawn areas, and moveable boat racks. A bituminous concrete boat launch that extends into the lake and the asphalt is crumbling and deteriorating into/ on the lake bed. The existing retaining wall, constructed from cobble and concrete, is failing and is currently being supported by overgrown tree roots.

The following wetland resource areas are within the project limits, and have been reviewed by the Conservation Administrator in the field with no modifications as shown on the approved plan set:

- Inland Bank to Lake Cochichewick (Top of Bank/MHW) TOB-1 thru TOB-36
- Bordering Vegetated Wetland WF-1 thru WF-6
- 100-Foot Buffer Zone
- Land Under a Waterbody/Waterway This resource was measured as the area enclosed by the top of bank flagging, which generally corresponds to elevation 111' within the project limits
- Bordering Land Subject to Flooding 100-Year Floodplain (no BFE determined)
- Lake Cochichewick includes Priority Habitat for Rare Species and Estimated Habitat of Rare Wildlife. This habitat generally encompasses the footprint of the lake as well as adjacent conservation land to the west of the lake. Portions of the project will occur within the actual habitat of the *Ligumia Nasuta*, Eastern Pondmussel.
- As the sole source of the Town's drinking water, Lake Cochichewick is listed as an Outstanding Resource Water

These resource areas are significant to the interests of the Act and Town Bylaw as noted above and therein. The applicant has not attempted to overcome the presumption of significance of these resource areas to the identified interests.

Previous Permit History:

• OOC, DEP #242-1679 - demolition of the existing pump station structures and associated appurtenances – CofC issued August 2024

Therefore, the North Andover Conservation Commission (hereafter the "NACC") hereby finds that the following conditions are necessary, in accordance with the Performance Standards set forth in the State Regulations, the local Bylaw and Regulations, to protect those

interests noted above. The NACC orders that all work shall be performed in accordance with said conditions and with the Notice of Intent/approved plans referenced below. <u>To the extent that the following conditions modify or differ from the plans, specifications or other proposals submitted with the Notice of Intent, the conditions shall control.</u>

GENERAL CONDITIONS

20. The proposed work includes: The proposed project will reconstruct the existing handcarry boat launch, replace the failed concrete and stone retaining wall along the shoreline, and re-organize the parking, driveway, and boat rack areas. Key project features include the new boat launch to consist of permeable concrete pavers with a porous gravel fill and stone/sand drainage/geogrid layer underneath with its side slopes to be stabilized with a large boulder revetment, and a new Mechanically Stabilized Earth (MSE) concrete block retaining wall along portions of the shoreline. The improvements will also feature permeable paver parking areas and driveways as well as infiltration basins to manage stormwater runoff. Tree removal with 1:1 replacement of all trees 6" diameter or greater – replacement trees shall be 2+ gallons or 4-5' or larger. Other site appurtenances include recreational/social space, a new double swing gate and locking bollards at the boat ramp to restrict access and ensure security.

The applicant has requested a waiver from the local 25' NDZ/50' NBZ for the proposed work – the NACC voted to grant said waiver as the NACC finds that the nature of the work (boat launch and shoreline retaining wall rehabilitation and associated work) necessitates work to be performed within the resource area and associated immediate buffer zones which will result in an improved and more stable conditions of these resources.

Wetland Resource Impacts & Limited Project Status:

Work will take place within Inland Bank, Land Under Waterbodies/Waterway, Bordering Land Subject to Flooding (100-Year Floodplain) and 100-Foot Buffer Zone:

Inland Bank:

- 202 l.f. of Inland Bank, restore 202-linear feet. The work in this resource area is required to install retaining walls, boat launch, and stabilize eroded earth embankment with riparian rock:
 - 16 l.f. of the inland bank consists of existing boat launch, and proposed launch will occupy the same l.f.;
 - 100 l.f. of the inland bank consists of existing retaining wall, with the new retaining wall positioned at upland edge of bank limits
 - 165 l.f. of other impacts to the inland bank will result from grading, tree clearing, riprap at toe of wall and slope stabilization east of the new retaining wall

- Remaining 20 l.f. of bank disturbance is for temporary impacts for construction access
- The project qualifies as a Limited Project Status since inland bank disturbance exceeds the allowable 50 l.f. or 10% (whichever is lower)

Land Under Waterbodies/Waterways:

Alteration of 4,838-s.f. of this resource area, with 5,075 s.f. replacement, and 63 c.y. dredged

Bordering Land Subject to Flooding:

1,540 s.f. of BLSF will be altered, with equal s.f. replacement and 396.5 c.f. created

The Planning Board processed a Watershed Special Permit application and issued an approval decision with conditions on October 15, 2024.

The project is subject to Mass DEP Stormwater Standards under redevelopment provisions, as well as North Andover's Stormwater Management & Erosion Control Bylaw. The project's stormwater design was reviewed by the Town's 3rd party peer review engineering firm, Horsley & Witten who provided 3 rounds of comments.

The project is subject to permitting with the following: USACE – PNC; EOEEA – MEPA; NHESP – MESA; DEP – Chap. 91 & 401 WQ; Mass Historical Comm. – Project Notification.

21. The work shall conform to the following (except as noted in the remainder of this document where revisions may be required):

Notice of Intent filed by: North Andover DPW c/o John Borgesi, P.E. - Town Engineer

Representative: Environmental Partners, An Apex Company Jamie Veillette, EIT 1900 Crown Colony Drive, Suite 402 Quincy, MA 02169

Site Plans & Documents:

- Notice of Intent and associated supporting materials, singed by John Borgesi, dated 07-26-24. NOI includes NHESP MESA Determination Letter dated 03-15-24 with conditions;
- Page #3 of the NOI revised with updated wetland impact calculations by the 08-26-24 Supplemental Response Package;
- Plan Set "North Lake Cochichewick Boat Launch" –Six Sheets prepared by Environmental Partners, signed and stamped by Ryan Paul, PE, revision dated December 5, 2024;

- Horsley Witten Group, Peer Review Comments Letters dated 08-26-24, 09-20-24 & 10-01-24;
- Environmental Partners Response Letters to Peer Review dated 09-11-24 & 09-26-24;
- Stormwater Report, prepared by Environmental Partners, singed and stamped by Ryan Paul, PE dated July 2024 Sections Revised by 09-11-24 Environmental Partners Response Letter to Peer Review;
- Supplemental Response Packages to NACC Information Requests, prepared by Environmental Partners dated 08-13-24, 08-26-24, 10-04-24 & 11-07-24;
- NHESP Comment & Conditions Letter dated March 15, 2024.
- 22. The term "Applicant" as used in this Order of Conditions shall refer to the owner, any successor in interest or successor in control of the property referenced in the Notice of Intent, supporting documents and this Order of Conditions. The NACC shall be notified in writing within 30 days of all transfers of title of any portion of property that takes place prior to the issuance of a Certificate of Compliance.
- 23. The conditions of this decision shall apply to, and be binding upon, the applicant, owner, its employees and all successors and assigns in interest or control. These obligations shall be expressed in covenants in all deeds to succeeding owners of portions of the property.
- 24. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
- 25. This Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of property rights. However, the NACC, agent of the NACC or the Department of Environmental Protection (DEP) reserves the right to enter and inspect the property at all reasonable times until a Certificate of Compliance is issued, to evaluate compliance with this Order of Conditions, the Act (310 CMR 10.00), the North Andover Wetland Bylaw and Regulations, and may require any information, measurements, photographs, observations, and/or materials, or may require the submittal of any data or information deemed necessary by the NACC for that evaluation. Further, work shall be halted on the site if the NACC, agent or DEP determines that any of the work is not in compliance with this Order of Conditions. Work shall not resume until the NACC is satisfied that the work will comply and has so notified the applicant in writing.
- 26. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state or local statutes, ordinances, by-laws or regulations.

- 27. The work authorized hereunder shall be completed within <u>three years</u> from the date of this order.
- 28. This Order may be extended by the issuing authority for one but not more than two periods of up to one year each upon application to the issuing authority at least <u>thirty</u> <u>days (30) prior to the expiration date of the Order</u> (*Refer to Section 8.3*) of the North Andover Wetland Regulations).
- 29. The NACC reserves the right to amend this Order of Conditions after a legally advertised public hearing if plans or circumstances are changed or if new conditions or information so warrant.
- 30. Where the Department of Environmental Protection (DEP) is requested to make a determination and to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before the Department.
- 31. The NACC finds that the intensive use of the upland areas and buffer zone proposed on this site will cause further alteration of the wetland resource areas. In order to prevent any alteration of wetland resource areas, except where a waiver has been granted in those zones for work authorized under this Order, a <u>twenty five foot (25')</u> <u>No-Disturbance Zone and a fifty foot (50') No-Construction Zone</u> shall be established from the edge of the adjacent wetland resource area. The Conservation Administrator and/or other agents of the NACC do not have the authority to waive these setbacks as established under the local bylaw. No disturbance of existing grade, soils or vegetation is permitted in the No-Disturbance zone. (See Section 3.4 & Appendix F of the local Regulations). Any future work proposed within 100 feet of these wetland resource areas shall require a separate application with the NACC.
- 32. This document shall be included in all construction contracts, subcontracts, and specifications dealing with the work proposed and shall supersede any conflicting contract requirements. The applicant shall assure that all contractors, subcontractors, and other personnel performing the permitting work are fully aware of the permits terms and conditions. Thereafter, the contractor will be held jointly liable for any violation of this Order resulting from failure to comply with its conditions.
- 33. Issuance of these Conditions does not in any way imply or certify that the site or downstream areas will not be subject to flooding, storm damage or any other form of water damage.

PRIOR TO CONSTRUCTION

- 34. No work shall be undertaken until all administrative appeal periods from this Order have elapsed or, if such an appeal has been filed, until all proceedings before the Department or Court have been completed.
- 35. This Order shall be recorded, <u>in its entirety</u>, by the applicant at the Registry of Deeds immediately after the expiration of all appeal periods. No work shall be undertaken until the Final Order has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is to be done. The recording information shall be submitted to the North Andover Conservation Commission on the form at the end of this Order prior to commencement of the work. Any Order not recorded by the applicant before work commences may be recorded by the NACC at the applicant's expense.
- 36. **Prior to sending out for bid**, the draft RFP shall be submitted to the Conservation Commission for review and verification of compliance with the conditions herein.
- 37. The RFP package shall include this Order of Conditions and shall require a separate **CASH wetland protection bond in the amount of twenty thousand dollars (\$20,000)** specifically related to work involving wetland impacts and restoration. A check payable to the Town of North Andover shall be provided in the amount of twenty thousand dollars \$20,000 which shall be in all respects satisfactory to Town Counsel, Town Treasurer, and the NACC, and shall be posted with the North Andover Town Treasurer through the NACC before commencement of work. Said deposit of money shall be conditioned on the completion of all conditions hereof, shall be signed by a party or parties satisfactory to the NACC, and Town Counsel, and shall be released after completion of the project, provided that provisions, satisfactory to the NACC, have been made for performance of any conditions which are of continuing nature. The applicant may propose a monetary release schedule keyed to completion of specific portions of the project for the NACC's review and approval. This condition is issued under the authority of the local Bylaw.
- 38. **Prior to work commencing on site and prior to the on-site pre-construction meeting**, the following documents and materials shall be submitted and then the contractor, applicant, project engineer, erosion control monitor shall arrange meeting with the Conservation Administrator to review and establish the following:
 - Plans that detail soils management and dewatering (normal & special) shall be prepared and stamped by a PE licensed in Mass., possessing at least 5 years' experience in successfully designing such systems under similar conditions.
 <u>**See Special Condition #40 & 41 below.</u>** Prior to the on-site pre-construction meeting, the contractor and the design engineer shall appear before the

Conservation Commission at a regularly scheduled meeting to present the soils management & dewatering plan for additional review and comment. This information shall be submitted under a request to Modify the Order of Conditions. The Commission reserves the discretion to assign additional conditions as deemed necessary to properly protect the wetland resource areas.

- b. 100% construction drawings accompanied by a memorandum, prepared by a licensed PE, that details plan revisions versus the approved plan set referenced in this Order and shall be submitted to the Conservation Department. The memorandum shall provide a review of any revisions within the Commission's jurisdiction and resulting conflicts with the Special Conditions of this Order. The Conservation Department in consultation with the Chairman shall make a determination as to whether said revisions can be reviewed administratively or by way of modification or amendment with the Commission.
- c. A copy of the Order of Conditions, with each page bearing the general contractor/site supervisor's initials to ensure acknowledgment/understanding of all conditions herein.
- d. Electronic copies of all other listed permits/approvals shall be submitted to the Conservation Department, including SWPPP if applicable;
- e. The applicant/contractor shall submit to the NACC for approval, a detailed and dated sequence of construction, including the installation of sedimentation/erosion control devices, demolition, and all other work planned through final stabilization.
- f. The applicant shall designate a Wetland Scientist (or other environmental professional as approved by the NACC or its agent) as an "Erosion Control Monitor" (Monitor). The name and phone number of the Monitor must be provided to the NACC in the event that this person has to be contacted, due to an emergency at the site, during any 24-hour period, including weekends. Proof of the retained monitor must be submitted to the Conservation Department on letterhead by the retained consulting firm. The Monitor shall be on site during and/or following a major storm event of $\frac{1}{2}$ inch of rain or greater (24 hour event) to ensure that soils remain stable, and erosion controls are adequate and secure. At least once during each week in which construction activities occur on-site and for as long thereafter as ground remains unstable, the Monitor shall submit a written report with photos to the NACC certifying that, to the best of his/her knowledge and belief based on a careful site inspection, all work is being performed in compliance with this Order of Conditions and that approved setbacks are being adhered to. The Monitor must visually inspect all sedimentation/erosion control measures and assume responsibility for their maintenance on a weekly basis and that they are functioning as intended. In addition, all wetland resource areas must be visually inspected for siltation, turbidity, and/or other water quality impacts. The Monitor shall oversee any emergency placement of controls and regular inspection or replacement of sedimentation control devices. This person shall be given the authority to stop construction for erosion control purposes. The

Monitor will immediately notify the Conservation agent of any matter that requires attention by the Commission or the agent. The Monitor will be required to inspect all such devices and oversee cleaning and the proper disposal of waste products. Cleaning shall include removal of any entrapped silt.

- g. Review of the entire Order of Conditions to ensure understanding by all parties.
- h. A contact list for all responsible parties for site development and monitoring phases. Contact list shall include names, role, cell and office phone numbers, mailing addresses and email addresses.
- 39. Prior to construction and in time for the on-site pre-construction meeting the following shall be implemented/prepared for Conservation Department and Planning Department inspection:
 - a. Two signs shall be displayed at the work site not less than two square feet or more than three square feet in size bearing the words "Mass DEP, File Number 242-1900." – one visible from the street and one from the water;
 - b. All erosion control/construction entrance/dewatering management measures shall be properly installed, by survey in the field, as shown on the approved plan set. A minimum of 12" bark mulch sock backed by trenched siltation fence, shall be placed between all construction areas and wetlands. The erosion control barrier will be properly installed and placed in the location shown on the plans approved and referenced herein and shall be inspected and approved by the NACC or its agent prior to the start of construction and shall remain intact until all disturbed areas have been permanently stabilized to prevent erosion. All erosion prevention and sedimentation protection measures found necessary during construction shall be implemented at the direction of the NACC or its agent. The NACC reserves the right to impose additional conditions on portions of this project to mitigate any impacts which could result from site erosion, or any noticeable degradation of surface water quality discharging from the site. For example, installation of erosion control measures may be required in areas not shown on the plan(s) referenced in this Order of Conditions. Should such installation be required by the NACC, they shall be installed within 48 hours of the Commission's request. Il additional erosion prevention and sedimentation protection measures found necessary during construction shall be implemented at the direction of the NACC or its agent. The NACC reserves the right to impose additional conditions on portions of this project to mitigate any impacts which could result from site erosion, or any noticeable degradation of surface water quality discharging from the site. For example, installation of erosion control measures may be required in areas not shown on the plan(s) referenced in this Order of Conditions. Should such installation be required by the NACC, they shall be installed within 48 hours of the Commission's request.
 - c. Wetland flagging shall be checked prior to start of construction and shall be reestablished where missing. All wetland flagging shall remain visible and

enumerated per the approved plan(s) throughout the life of the project and until a Certificate of Compliance is issued so that erosion control measures can be properly placed and wetland impacts can be monitored. Such barriers shall be checked and replaced as necessary and shall be maintained until all construction is complete.

- d. All existing and any other stormwater inlets on the site or on the streets adjacent to the project shall be protected by erosion/sedimentation controls to prevent sediment from entering the drainage system. Erosion/sedimentation controls shall be maintained and regularly cleaned of sediments until all areas associated with the work permitted by this Order have been permanently stabilized and the Commission has formally approved their removal.
- e. The applicant/contractor shall have on hand at the start of any soil disturbance, removal or stockpiling, <u>an additional 100 feet of silt sock/compost filter tube</u>, <u>silt fence and sufficient stakes for staking covered from the elements</u>, and shall be used only for the control of emergency erosion problems and shall not be used for the normal control of erosion. The NACC or its Agent shall have the discretion to require additional emergency erosion control BMP's to be brought to the site if deemed necessary.
- f. The applicant/contractor shall have absorbent materials for use in containing accidental spills available on site at all times and shall be on site in time for the pre-construction on ist meeting for verification. If any release of fuel, motor oil, lubricating oils, etc. occurs, the applicant or designee shall immediately notify the Commission's Office at (telephone number). A response action or cleanup shall be conducted pursuant to GL c. 21E (Massachusetts Oil and Hazardous Material Release Prevention and Response Act) and the Massachusetts Contingency Plan (MCP).
- g. All trees slated for removal shall be flagged in the field and reviewed by Conservation and Planning staff for necessity of their removal;
- h. A final 100% native planting plan shall be submitted to the Conservation Department for review and approval;
- i. Prior to any work commencing on site, it is the responsibility of the applicant to procure all other applicable federal, state and local permits and approvals required for this project, or phases of the project where appropriate, and no work within the Commission's jurisdiction shall commence until all other state or local permits, approvals, and variances have been obtained. This is to ensure that impact to jurisdictional areas are avoided in the case that any such permit is denied or withheld for any period of time, thereby maintaining the integrity of the resource area or buffer zone until such time all approvals are granted.
- j. All copies and related verifications as required by NHESP for mussel protection shall be submitted to the Conservation Department upon immediate availability.

40. Dewatering:

- a. A meeting with the Conservation Administrator is required prior to installation and startup of the dewatering system
- b. Approved de-watering activities per Special Condition #39.a. shall be supervised and witnessed by the designated Monitor.
- c. All dewatering activities shall be conducted as detailed in the approved dewatering plan and shall be monitored daily by the erosion control monitor to ensure that water discharged meets all requirements of the NPDES General Construction Permit SWPPP (if applicable), and Town of North Andover Conservation Commission Order of Conditions.
- d. Turbidity of the discharged water shall not exceed 40 NTU.(?)
- e. No discharge shall be allowed directly into the resource area.
- f. Discharge where available shall be through an existing BMP or shall be overland crossing a stabilized or vegetated area. Volume of water shall not erode or otherwise damage the discharge surface.
- g. If emergency dewatering requirements arise, the applicant shall submit a contingency plan to the Commission for approval.
- h. Contractor shall make modifications to the system or operation of the system if the required criteria are not met or to adjust for varying field conditions.

41. Stockpiling:

- a. Stockpile location for all erodible materials (stone/soil) shall be confirmed at the preconstruction meeting. All stockpiled materials shall be contained within erosion controls, and at the Conservation Administrator's direction surrounded by separate erosion controls if deemed necessary. Excavated material not suitable for re-use shall be trucked off-site for legal disposal. Contractor shall have on hand at the start of any soil disturbance, removal, or stockpiling, an additional 100 feet of silt sock/compost filter tube, silt fence, and sufficient stakes for staking covered and protected from the elements, and shall be used only for the control of erosion. The NACC or it's Agent shall have the discretion to require additional emergency erosion control BMPs to be brought to the site if deemed necessary.
- b. Associated pavement and roadways, including project site and hauling route to staging or stockpile location, shall be swept at least weekly or as directed by the Erosion control Monitor, the Site Supervisor, Project Manager, or Conservation staff for as long as the site remains exposed and un-stabilized. If material is tracked beyond the construction entrance onto the adjacent roadway, the roadway will be swept daily.

42. Refueling:

a. A fueling plan and spill prevention plan shall be provided for all equipment on the project site that will be fueled. Trucks and other mobile equipment shall be fueled at a location away from the project site.

- 43. No changes to the approved plan shall be implemented in the field until written approval has been granted by the NACC. Any changes in the submitted plans caused by the applicant, another Board's decision or resulting from this Order of Conditions must be submitted to the NACC for approval prior to implementation. If the NACC finds said changes to be significant, the NACC will call for another public hearing (at the expense of the applicant). Within 21 days of the close of said public hearing the NACC will issue an amended or new Order of Conditions. Any errors found in the plans or information submitted by the applicant shall be considered as changes.
- 44. It is the responsibility of the applicant, owner, and/or successor(s) to ensure that all conditions of this Order of Conditions are complied with. The project engineer and contractors are to be provided with a copy of this Order of Conditions and referenced documents before commencement of construction.
- 45. The erosion controls shall serve as the limit of work. Workers should be informed that no use of machinery, storage of machinery or materials, stockpiling of soil, or construction activity is to occur beyond this line at any time.
- 46. The applicant and/or the legal owner of that portion of land upon which these Orders of Conditions have been placed shall provide to the NACC prior to transferring, or assigning any portion of said land to another party, subject to said Orders of Conditions, the "Compliance Certification Form Affidavit" attached via "Appendix A" signed under the pains and penalties of perjury, stating that said applicant and/or owner has read these Orders of Conditions and is in compliance with each and every condition. This document shall apply to each of the conditions referenced herein and shall be provided to the Conservation Department at least five (5) business days prior to the closing of said land transaction.
- 47. Once these above-mentioned pre-construction requirements are complete, the applicant shall contact the Conservation Office prior to site preparation or construction and shall arrange an on-site conference with an <u>NACC and Planning Department representative</u>, the project engineer, the contractor, the erosion control monitor and the applicant to ensure that all of the Conditions of this Order are understood. This Order shall be included in all construction contracts, subcontracts, and specifications dealing with the work proposed and shall supersede any conflicting contract requirements. The applicant shall assure that all contractors, subcontractors and other personnel performing the permitted work are fully aware of the permit's terms and conditions. Thereafter, the contractor will be held jointly liable for any violation of this Order of Conditions resulting from failure to comply with its conditions. The applicant or contractor shall notify the NACC in writing of the identity of the on-site construction supervisor hired to coordinate construction and to ensure compliance with this Order. A reasonable period of time shall be provided as notice of the pre-construction meeting (e.g. 72 hours).

STORMWATER MANAGEMENT CONDITIONS

- 48. There shall be no increase in the post development discharges from the storm drainage system or any other changes in post development conditions that alter the post development watershed boundaries as currently depicted in the Notice of Intent and approved by this Order of Conditions, unless specifically approved in writing by the Commission.
- 49. Water quality in down gradient BVW's shall not differ significantly following completion of the project from the pre-development conditions. There shall be no sedimentation into wetlands or water bodies from discharge pipes or surface runoff leaving the site.
- 50. Prior to the issuance of the Certificate of Compliance, the applicant shall be responsible for cleaning all stormwater structures, in accordance with the approved Post Construction Operation and Maintenance Plan (O&M) attached herein and the associated stormwater management conditions mandated herein. Evidence of said cleaning (i.e. invoices/bills of lading) shall be submitted to the Conservation Department for its file.
- 51. All stormwater best management practices shall be maintained as specified in the approved Operation and Maintenance Plan (O&M) submitted with the Notice of Intent and incorporated in the Order of Conditions. Evidence of maintenance of the stormwater management system shall be provided to the NACC on an annual basis by a Registered Professional Civil Engineer or other qualified professional post construction. The first report shall be submitted to the NACC one year after the first stormwater structure goes on-line. The approved Operation & Maintenance Plans are fully binding upon the applicant and/or owners, successors, agents, associations, heirs and assigns and must be adhered to in perpetuity.

DURING CONSTRUCTION

- 52. Prior to plant/seed installation, order forms/invoices for the plant materials shall be provided to the Conservation Department to ensure native species are chosen.
- 53. Upon beginning work, the applicant/erosion control monitor shall submit written progress reports every month detailing what work has been done in or near resource areas, and what work is anticipated to be done over the next period. This will update the construction sequence and can be a part of the weekly erosion control reports.

- 54. <u>All dewatering activities shall be supervised and witnessed by the designated erosion</u> <u>control monitor</u>. De-watering activities shall be monitored daily by the erosion control monitor to ensure that sediment laden water is appropriately settled prior to discharge toward the wetland resource areas. If other emergency de-watering requirements arise, the applicant shall submit a contingency plan to the Commission for approval, which provides for the pumped water to be contained in a settling basin, to reduce turbidity prior to discharge into a resource area.
- 55. Any fill used in connection with this project shall be clean fill, containing no trash, refuse, rubbish or debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, glass, processed glass aggregate, concrete, recycled concrete aggregate, tires, ashes, refrigerators, motor vehicles or parts on any of the foregoing. Any fill imported to the site must be accompanied by a certificate of origin or an analysis certifying cleanliness whichever is most applicable as determined by the Conservation Commission or its staff.
- 56. No on-site fuel storage shall occur during construction. Equipment may be refueled outside the 100-Foot Buffer Zone by delivery.
- 57. All exposed soil finish grade surfaces shall be immediately landscaped and stabilized, or loamed, seeded and mulched, with a layer of mulch hay. All disturbed areas must be graded, loamed and seeded prior to November 1st of each year. Outside of the growing season, exposed soil finish grade surfaces shall be stabilized with a layer of mulch hay until climate conditions allow for seeding. During construction, any area of exposed soils that will be left idle for more than 30 days shall be stabilized with a layer of mulch hay or other means approved by the NACC.
- 58. Associated pavement and roadways shall be swept at least weekly or as directed by the Erosion Control monitor, the Site Supervisor, Project Manager, or Conservation staff for as long as the site remains exposed and un-stabilized. If material is tracked beyond the construction entrance onto the adjacent roadway, it will be swept up daily.
- 59. No re-grading in the buffer zone shall have a slope steeper than 2:1 (horizontal: vertical) other than what is allowed under this Order, if any.
- 60. The construction access for the project shall be swept daily to remove sediment deposited by construction vehicles accessing the site and avoid tracking on to public right of way.
- 61. A materials stockpiling areas shall be contained. Additional containment measures may be required by the Conservation Department at its discretion. At no time shall be stockpiling of soil or any other materials occur on the wetland side of the erosion controls.

- 62. Construction equipment, vehicles and materials shall be stored as far away from the wetland resources as possible and surrounded with appropriate controls in a manner that prevents erosion into the wetland.
- 63. All waste generated by, or associated with, the construction activity shall be contained within the limit of work, and away from any wetland resource area. There shall be no burying of spent construction materials or disposal of waste on the site by any other means. The applicant shall maintain dumpsters (or other suitable means) at the site for the storage and removal of such spent construction materials off-site. However, no trash dumpsters will be allowed within 100 feet of the edge of the wetland.
- 64. Accepted engineering and construction standards and procedures shall be followed in the completion of the project.
- 65. During and after work on this project, there shall be no discharge or spillage of fuel, or other pollutants into any wetland resource area. If there is a spill or discharge of any pollutant during any phase of construction the NACC shall be notified by the applicant within one (1) business day. No construction vehicles are to be stored within 100 feet of wetland resource areas, and no vehicle refueling, equipment lubrication, or maintenance is to be done within 100 feet of a resource area.

AFTER CONSTRUCTION

- 66. A written report detailing the integrity of the boat launch as a result of a winter season experiencing frozen lake conditions, documenting any impacts or damage to the launch construction materials, shall be submitted to the Conservation Department for review and any follow up that may be required to address deficiencies or needed repairs.
- 67. No underground storage of fuel oils shall be allowed on any lot within one-hundred (100) feet of any wetland resource area. This condition shall survive this Order of Conditions and shall run with the title of the property. This condition is issued under the authority of the Town's Wetland protection Bylaw.
- 68. Fertilizers utilized for landscaping and lawn care shall be slow release, low-nitrogen types (< 5%), and shall not be used within 25 feet of a resource area. Pesticides and herbicides shall not be used within 100 feet of a wetland resource area. No sodiumbased products shall be used for control of ice or snow within 100 feet of the wetland. This condition shall survive this Order of Conditions and shall run with the title of the property. This condition is issued under the authority of the Town's Wetland Protection Bylaw and shall remain in perpetuity.

- 69. There shall be no dumping of leaves, grass clippings, brush, or other debris into a wetland resource areas or the 25-foot No-Disturb Zone. This condition shall remain in perpetuity.
- 70. Upon completion of construction and grading, all disturbed areas located outside resource areas shall be stabilized permanently against erosion. This shall be done by loaming and seeding according to NRCS standards. Stabilization will be considered complete once full vegetative cover has been achieved.
- 71. The use of coal tar-based pavement sealants is prohibited on the property, as they have been determined to contribute high levels of polycyclic aromatic hydrocarbons (PAHs) to stormwater runoff. This condition shall survive the Order of Conditions and shall run with the title of the property.
- 72. Upon approved site stabilization by Conservation staff, the erosion controls shall be removed and properly disposed of and all exposed unvegetated areas shall be seeded.
- 73. Upon completion of the project the applicant shall submit the following to the Conservation Commission as part of a request for a Certificate of Compliance:
 - a. WPA Form 8A "Request for a Certificate of Compliance."
 - b. A letter from the applicant requesting a Certificate of Compliance.
 - c. The name and address of the current landowner.
 - d. Signed statements from the individual property owners shall be submitted with the request for a Certificate of Compliance indicating that they read and understood the recorded Order of Conditions prior to purchasing their property.
 - e. The name and address of the individual/trust or corporation to whom the compliance is to be granted.
 - f. The street address and assessor's map/parcel number for the project.
 - g. The DEP file number.
 - h. A written statement from a Registered Professional Civil Engineer (and/or Registered Professional Land Surveyor) of the Commonwealth certifying that the work has been conducted as shown on the plan(s) and documents referenced above, and as conditioned by the Commission.
 - i. An "As-Built" plan prepared and signed and stamped by a Registered Professional Civil Engineer (and/or Registered Professional Land Surveyor) of the Commonwealth, for the public record. This plan will include:
 - "As-Built" post-development elevations of all drainage & stormwater management structures constructed within 100 feet of any wetland resource area.
 - "As-Built" post-development elevations and grades of all filled/altered/replicated wetland resource areas including the

encompassing buffer zone which is regulated as a resource area under the local Wetland Protection Bylaw.

- Distances from structures to wetland resource areas. Structures include (but are not limited to) septic systems, additions, fences, sheds, stone walls, pools, retaining walls, subsurface utilities and decks.
- A line showing the limit of work and the extent of existing erosion control devices. "Work" includes <u>any</u> disturbance of soils or vegetation.
- Location of all subsurface utilities entering the property.
- 87. The following special conditions shall survive the issuance of a Certificate of Compliance (COC) for this project:
 - 25' No-Disturbance Zone and a 50' No-Construction Zone. Future work within 100' of existing wetland resource areas will require a separate filing with the NACC of the Regulations for performance standards within these zones) The Conservation Administrator and/or other agents of the NACC do not have the authority to waive these setbacks as established under the local Bylaw (Condition #31);
 - Adherence to the Stormwater Operation & Maintenance Plan (Condition #51).
 - Discharge or spillage of pollutants (Condition #65);
 - Prohibition of underground fuels (Condition #67);
 - Limitations on the use of fertilizers, herbicides, and pesticides (Conditions #68);
 - No dumping of leaves, grass clippings, brush, or other debris into a wetland resource areas or the 25-foot No-Disturb Zone (Condition #69);
 - Prohibition of the use of coal tar based products for paving (Condition #71).

APPENDIX A - AFFIDAVIT

I,	on oath do hereby depose and state:											
(authorized	a agent applicant and/or current owner)											
	(PLEASE CHECK AT LEAST ONE BLOCK)											
1	I am theof(position with applicant)(applicant name or company name)											
	the applicant upon whom Order of Conditions											
	have been placed upon by (DEP or NACC number)											
the North Andover Conservation Commission.												
	&/or											
2	I am the of											
	(position with owner) (owner name)											
	the owner upon whose land Order of Conditions											
	the North Andover Conservation Commission.											
	87											
3. I	hereby affirm and acknowledge that I have received said Order of Conditions											
ہ (D)	and have read the same and understand each											
in sa	id Order of Conditions.											
	0											
4 T	bereby affirm and acknowledge that on this day of 10											
I insp	ected said property together with any and all improvements which have											
been	made to the same and hereby certify that each and every condition set											
forth	in Order of Conditions are presently in compliance.											
	(DEP File #)											
	&											
5. I here	by affirm and acknowledge that this document will be relied upon by the											
said r	property which is subject to said Order of Conditions											
1	(DEP File #)											
0:1												
Signed under	r the pains and penalties of perjury this day of 19											

(Signature - authorized agent of applicant or owner)



Town of North Andover Planning Department Community & Economic Development Division 120 Main Street North Andover, Massachusetts 01845

Date: October 22, 2024

Dear: Jamie Veillette, Environmental Partners Group, LLC Applicant

The Planning Board issued a Decision for the following permit(s):

<u>Watershed Special Permit</u> Permit Type <u>0 Great Pond Road, (across from 1939 Great Pond Road), North Andover, MA 01845, Map 35, Lot 21</u> Location of Premises

Your 20-day appeal period will have passed at midnight on the following date: November 11, 2024

- 1. Once the appeal period has passed, please pick up your Town Clerk-certified copy of the Planning Board's decision from the Town Clerk's office located at 120 Main Street, North Andover, MA 01845 (phone: 978-688-9501).
- Please make a paper copy of the final approved site development plan and any other applicable plans and bring to 120 Main Street to have the Planning Director sign the final plans. These plans are to be attached to the Town Clerkcertified copy of the Planning Board's Notice of Decision.
- 3. Please bring the Town Clerk-certified copy of the decision with the Planning Director signed plans attached to the Northern Essex Registry of Deeds, 1 Union Street #402, Lawrence, MA 01840 (phone 978-557-1900), as the decision and plans must be filed at the Northern Essex Registry of Deeds as soon as possible.
- 4. Once this is complete please bring: two (2) copies of the recorded, certified decision and the Northern Essex Registry of Deeds receipt to the Planning Department which is located at Town Hall, 120 Main Street, North Andover, MA 01845. Failure to file the decision with the Registry of Deeds will result in your inability to exercise your special permit approval and your inability to obtain a building permit with the Building Department. A Special Permit granted under the provisions contained herein shall be deemed to have lapsed after a two (2) year period from the date on which the Special Permit was granted unless substantial use or construction has commenced or an extension has been granted by the Planning Board.

If you have any questions, please feel free to call (978-688-9535) or fax (978-688-9542), during regular business hours.



Town of North Andover Office of the Planning Department Community Development and Services Division 120 Main Street North Andover, Massachusetts 01845

NOTICE OF DECISION WATERSHED SPECIAL PERMIT

Any appeal shall be filed within (20) days after the date of filing this notice in the office of the Town Clerk

> Date: October 15, 2024 Date of Public Hearing: August 27, 2024, October 15, 2024 Date of Decision: October 15, 2024

Petition of:

Jamie Veillette Environmental Partners Group, LLC 1900 Crown Colony Drive, Suite 402 Quincy, MA 02169

Owner:

Town of North Andover 120 Main Street North Andover, MA 01845

Premises Affected: Map 35, Lot 21 (0 Great Pond Rd., across from 1939 Great Pond Rd.)

Referring to the above petition for Review of a Watershed Special Permit, according to the requirements of the North Andover Zoning Bylaw, Article 4 Part 5 and Article 10 Section 195-10.7 and MGL C.40A, Sec. 9

So as to authorize Site improvements including demolition of the existing bituminous concrete boat launch, retaining wall, and gravel parking area. The Project includes construction of a new hand carry boat launch, block retaining wall, permeable paver parking area and driveways, two bioretention areas, and landscaping. The proposed work is located within the Non-Disturbance of the Watershed Protection District. The property is located in the Residential 1 (R-1) Zone.

After a public hearing given on the above date, and upon a motion by P. Boynton and a 2^{nd} by S. Kevlahan, to APPROVE, as amended, a Watershed Special Permit with the following conditions imposed on the Project by a vote of 5 - 0, unanimous in favor or the application.

Jean Enright On behalf of the North Andover Planning Board Eitan Goldberg, Chairman John Simons Sean Kevlahan Peter Boynton Chris Koskores Environmental Partners Group On behalf of the Town of North Andover) 0 Great Pond Road (across from 1939 Great Pond Road) Map 35, Lot 21 Watershed Special Permit The Public Hearing on the above referenced application was opened on August 27, 2024 and closed by the North Andover Planning Board on October 15, 2024.

On October 15, 2024, upon a motion made by P. Boynton and a second by S. Kevlahan to APPROVE, as amended, a Watershed Special Permit to authorize Site improvements including demolition of the existing bituminous concrete boat launch, retaining wall, and gravel parking area. The Project includes construction of a new hand carry boat launch, block retaining wall, permeable paver parking area and driveways, two bioretention areas, and landscaping. The proposed work is located within the Non-Disturbance of the Watershed Protection District. The property is located in the Residential 1 (R-1) Zone. This Special Permit was requested by Jamie Veillette, Environmental Partners Group, LLC, 1900 Crown Colony Drive, Suite 402, Quincy, MA 02169, on behalf of Owner, Town of North Andover on July 31, 2024. The Applicant submitted a complete application, which was noticed and reviewed in accordance with Article 4, Part 5 and Article 10, Section 195-10.7 of the North Andover Zoning Bylaw and MGL Chapter 40A, Section 9. The motion to approve was subject to the FINDINGS OF FACTS and SPECIAL CONDITIONS set forth in this decision.

The Planning Board vote was 5-0, unanimous in favor. A special permit issued by the special permit granting authority requires a vote of at least four members of a five-member board.

The Applicant is hereby notified that should the Applicant disagree with this decision, the Applicant has the right, under MGL Chapter 40A, Section 17, to appeal to this decision within twenty days after the date this decision has been filed with the Town Clerk.

The Planning Board makes the finding that the intent of the Bylaw, as well as its specific criteria are met. This decision specifically stated by the Planning Board makes the following **FINDINGS OF FACT**:

- The Project is located within an extremely environmental sensitive area and in close proximity to Lake Cochichewick, the Town's sole drinking water supply; however, the final design includes the implementation of Best Management Practices that reflect extensive discussions between the Town, the Town's stormwater peer review consultant, and Applicant to ensure the continued protection of Lake Cochichewick and the safety and welfare of the residents of North Andover.
- 2) The Project has been reviewed by the Town's Stormwater Review consultant, Horsley Witten, and with the application of erosion control measures and modifications to the drainage and stormwater management designs, the consultant concluded that there will not be significant degradation to the quality or quantity of water in or entering Lake Cochichewick. The Site drainage system and stormwater management design are designed in accordance with the Town Bylaw requirements and Best Engineering and Management Practices. (See eorrespondence from Horsley Witten dated August 26, 2024, September 20, 2024 and October 1, 2024) and Environmental Partners Group, LLC response comments dated September 11, 2024 and September 26, 2024.
- 3) The entire Site is located within the 150-foot Non-Disturbance Zone of Lake Cochichewick, with proposed work within Bordering Vegetated Wetlands (BVQ), inland Bank, Land Under Waterbodies and Waterways (LUWW), Bordering Land Subject to Flooding (BLSF), and the 25-foot, 50-foot, and 100-foot Buffer Zones to the BVW. The Project is also under the jurisdiction of the Conservation Commission.
- 4) The boat launch ramp is located within the 100-year floodplain, identified as Zone A on the most recent Flood Iusurance Rate Map (FIRM). The Applicant has noted the Top of Bank (TOB) at approximate elevation 113 and Observed High Water (OHW) at approximate elevation 114. By modifying the grades

Environmental Partners Group On behalf of the Town of North Andover) 0 Great Pond Road (across from 1939 Great Pond Road) Map 35, Lot 21

Watershed Special Permit

along the bank and reducing the slope of the new ramp, the proposed Project increases the flood storage volume by 100 cubic feet below elevation 114.

- 5) The proposed redevelopment included reducing the total impervious area from 5,253 square feet to 783 square feet, which includes eliminating the 5,074 square feet of existing gravel parking areas considered impermeable and installing 9,991 square feet of permeable pavers with crushed stonc.
- 6) Fertilizers are limited to those which are either organic or slow-release nitrogen and phosphorous-free, non-organic and pesticides/herbicides use are prohibited.
- 7) Per Plan Sheet G-1 General Notes and Legend #18: The locking bollards shown on Sheet C-6 are required to limit trailer access to the boat ramp for exclusive use by the Town of North Andover Fire Rescue. Lake Regulations promulgated by the Select Board prohibit any trailer launching boat into the lake by the general public. The North Andover Fire Department shall be responsible for keeping the locking bollards locked.
- 8) The specific Site is an appropriate location for the proposed use and structure as the proposed use is allowed and consistent with the current use. The Site design compliments the surrounding use and provides for sufficient boat storage and circulation improvements. The Site supports a range of recreational activities, including non-motorized boating during the spring, summer and fall seasons. Additionally, the boat launch plays a critical role in emergency response, providing access for the North Andover Fire Department's boat in the event of water-based emergencies.
- 9) The Site as redeveloped will not adversely affect the neighborhood. The Project provides stormwater management and landscaping.
- 10) There will be no nuisance or serious hazard to vehicles or pedestrians.
- 11) Adequate and appropriate facilities will be provided for the proper operation of the proposed use.
- 12) There is no reasonable alternative location outside the Non-Disturbance, Non-Discharge Zones and the General Zone for any discharge, structure or activity.

The Planning Board also makes a specific finding that the use is in harmony with the general purpose and intent of the North Andover Zoning Bylaw. Upon reaching the above findings, the Planning Board approves this Special Permit based upon the following **SPECIAL CONDITIONS**:

13) Permit Definitions:

- a) The "Locus" or "Site" refers to the approximately 1 acre of land on a portion of Assessors Map 35, Parcels 21, also known as 0 Great Pond Road, North Andover, Massachusetts.
- b) The "Plans" refer to the plans prepared by Environmental Partners Group, LLC, titled: North Lake Cochichewick Boat Launch Town of North Andover, MA, dated July 2024 and revised to August 9, 2024.
- c) The "Project" refers to Site improvements including demolition of the existing bituminous concrete boat launch, retaining wall, and gravel parking area. The Project includes construction of a new hand carry boat launch, block retaining wall, permeable paver parking area and driveways, two bioretention areas, and landscaping. The proposed work is located within the Non-Disturbance of the Watershed Protection District. The property is located in the Residential 1 (R-

Environmental Partners Group On behalf of the Town of North Andover) 0 Great Pond Road (across from 1939 Great Pond Road) Map 35, Lot 21

Watershed Special Permit

1) Zone.

- d) The "Applicant" refers to Jamie Veillette, Environmental Partners Group, LLC, 1900 Crown Colony Drive, Suite 402, Quincy, MA 01269, the Applicant for the Watershed District Special Permit.
- e) The "Project Owner" refers to the person or entity holding the fee interest to the title to the Locus from time to time, which can include but is not limited to the Applicant, developer, and Owner
- 14) There appears to be 16 trees proposed to be removed and 15 native trees to be installed. Trees proposed to be removed shall be staked in the field. The Conservation Administrator and Planning Director shall meet with the contractor to discuss the necessity of removal and review the list of size and types of trees to be installed (see Horsley Witten peer review letter dated October 1, 2024 #8 Standard 8.d).
- 15) The Planting Plan shall include all native species.
- 16) The contractor shall conduct additional soil testing within the footprints of the bioretention areas to confirm the soil texture as well as the depth to estimated seasonal high ground water (ESHGW). The soil logs as well as confirmation from a professional engineer that the design presented does not need to be adjusted shall be submitted to the Planning Director. Additionally, the contractor shall provide the stage storage HydroCAD worksheet for the two bioretention areas to confirm the storage volume listed in the calculations (1,432 cubic feet for Bioretention Areas #1 and 1,239 cubie feet for Bioretention Areas #2 (see Horsley Witten peer review letter dated Sept. 20, 2024 #2 Standard 2.d and 3.a).
- 17) The water table for the three borings was noted to be 6.5 feet below ground surface (bgs). Based on boring B1 the ESHGW is at approximately elevation 110.75. The bottom surface of the bioretention areas is elevation 115.0 and 115.5 with approximately 4.5 feet of planting soil and crushed stone below. To elevation 110.5 and 111.0. The contractor shall conduct additional soil testing to document that the ESHGW is lower than elevation 110.5 or raise the bottom of the systems. Receipt of the soil logs shall be submitted to the Planning Director (see Horsley Witten peer review letter dated Sept. 20, 2024 #2 Standard 2.e).
- 18) As specified in Finding of Fact #7, the North Andover Fire Department is responsible for keeping the locking bollards locked.
- 19) The Planning Director shall approve any changes made to these Plans. Any changes deemed substantial by the Planning Director would require a Public Hearing and Modification by the Planning Board.

PRIOR TO LAND DISTURBANCE and/or ISSUANCE OF A BUILDING PERMIT

- 20) Two (2) copies of the signed, recorded decision and Plans must be delivered to the Planning Department.
- 21) The Owner shall provide a signed version of the Illicit Discharge Statement two weeks prior to the beginning of any land disturbance (see Horsley Witten peer review letter dated October 1, 2024 #10 Standard 10.a).
- 22) The Applicant will provide copies of all Decisions, Notification, State permits, and Orders of Conditions from the North Andover Conservation Commission.

Environmental Partners Group

On behalf of the Town of North Andover)

0 Great Pond Road (across from 1939 Great Pond Road)

Map 35, Lot 21

- Watershed Special Permit
- 23) The Applicant shall provide a copy of a Section 401 Water Quality Certification (WQC), Chapter 91, Army Corps of Engineers, and MEPA approvals to the Planning Department (see Horsley Witten pecr review letter dated Sept. 20, 2024 #6 Standard 6.a).
- 24) The Town Engineer or his designec shall act as an environmental monitor. Upon the start of site work the monitor shall make weekly inspections of the Project (any suspension in monitoring due to inactivity on the Site shall be pre-approved by the Town Planner), provide monthly reports to the Planning Department, and detail any areas of non-compliance and corrective actions. The monitor will also provide reports following heavy rain events. The monitor must also be available upon notice to inspect the Site accompanying a Planning Department designated official.
- 25) A detailed construction schedule shall be submitted to the Planning Staff for the purpose of tracking the construction and informing the public of anticipated activities on the Site.
- 26) The Applicant shall install a 30-foot construction entrance as shown on Sheet C-2 (see Horsley Witten peer review letter dated October 1, 2024 #8 Standard 8.c).
- 27) All erosion control measures as shown on the plan must be in place and reviewed by the Planning Director.
- 28) A pre-construction meeting <u>must</u> be held with the developer, their construction employees, Planning Department and other applicable departments, to discuss scheduling of inspections to be conducted on the Project and the construction schedule.

DURING CONSTRUCTION

- 29) Any stockpiling of materials (dirt, wood, paver material, etc.) must be shown on a Plan and reviewed and approved by the Planning Staff. Any approved piles must remain covered at all times and fenced off to minimize any dust problems that may occur with adjacent properties. It shall be the responsibility of the developer to assure that no erosion from the construction Site shall occur which will cause deposition of soil or sediment upon adjacent properties or public ways, except as normally ancillary to off-site construction.
- 30) It shall be the responsibility of the Project Owner to assure that no erosion from the construction site shall occur which will cause deposition of soil or sediment upon adjacent properties or public ways, except as normally ancillary to off-site sewer or other off-site construction. Off-site erosion will be a basis for the Planning Board making a finding that the Project is not in compliance with the plan; provided, however, that the Planning Board shall give the developer written notice of any such finding and three (3) days to cure said condition.
- 31) In an effort to reduce noise levels, the developer shall keep in optimum working order, through regular maintenance, any and all equipment that shall emanate sounds from the structures or Site.

PRIOR TO CERTIFICATE OF OCCUPANCY

- 32) The Applicant must submit a letter from engineer of the Project stating that the landscaping and Site layout substantially comply with the Plans referenced at the end of this decision as endorsed by the Planning Board. The Applicant must also submit a letter from a professional engineer certifying that there are no illicit connections to the storm drainage system.
- 33) The Applicant shall submit an as-built plan stamped by a Registered Professional Engineer in Massachusetts that shows all construction, including stormwater mitigation trenches and other pertinent Site features. This as-built plan shall be submitted to the Town Planner for approval. The Applicant must

Environmental Partners Group

On behalf of the Town of North Andover)

0 Great Pond Road (across from 1939 Great Pond Road)

Map 35, Lot 21

Watershed Special Permit

submit a certification from the design engineer that the Site was constructed as shown on the approved Plan.

GENERAL CONDITIONS

- 34) Any plants, tree, shrubs, or fencing that have been incorporated into the Landscape Plan approved in this decision that die or fall into disrepair must be replaced by the Project Owner in perpetuity.
- 35) The contractor shall contact Dig Safe at least 72 hours prior to commencing any excavation.
- 36) All Gas, Telephone, Cable and Electric utilities to serve this Project shall be installed underground as specified by the respective utility companies, except for so called "green utility boxes" as may be required by the utility companies.
- 37) The hours for construction shall be limited to between 7:00 a.m. and 5:00 p.m. Monday through Friday and between 8:00 a.m. and 5:00 p.m. on Saturday.
- 38) No open burning shall be done except as is permitted during burning season under the Fire Department regulations.
- 39) The Owner shall apply to the Board of Health for the appropriate dumpster permit, if needed.
- 40) The provisions of this conditional approval shall apply to and be binding upon the Applicant, its employees and all successors and assigns in interest or control.
- 41) Any action by a Town Board, Commission, or Department, which requires changes in the Plan or design of the building, as presented to the Planning Board, may be subject to modification by the Planning Board.
- 42) This Special Permit approval shall be deemed to have lapsed after October 15, 2026 (two years from the date permit granted), exclusive of the time required to pursue or await determination of any appeals, unless substantial use or construction has commenced within said two-year period or for good cause. For purposes of this development, the developer shall be deemed to have undertaken substantial use or construction if the developer has begun any Site grading or tree clearing.
- 43) This decision must be filed with the North Essex Registry of Deeds. The following information is included as part of this decision:

Plan titled:	North Lake Cochichewick Boat Launch Town of North Andover, MA
Prepared for:	Town of North Andover
	120 Main Street
	North Andover, MA 01845
Prepared by:	Environmental Partners Group, LLC
	1900 Crown Colony Drive, Suite 402
	Quincy, MA 01269
Scale:	1"- 20'
Date:	July 2024, Revised to August 9, 2024

Stormwater Report:North Lake Cochichewick Boat LaunchPrepared for:Town of North Andover

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NORTH LAKE COCHICHEWICK BOAT LAUNCH

GENERAL NOTES AND LEGEND	EXISTING CONDITIONS	EROSION CONTROL AND DEWATERING PLAN	DEMOLITION PLAN	GRADING AND DRAINAGE FLAN	SITE PLAN	
INDEX G-1	2	C-2	3	3	C.5	

SITE RESTORATION PLAN

CIVIL DETAILS

CD-1 - CD-6 ŝ

TOWN OF NORTH ANDOVER, MA FOR PERMITTING JULY 2024

PETER BOYNTON - PLANING BOARD AND HARBORMASTER TED KELLEY - PROJECT PROPONENT JEAN ENRIGHT - DIRECTOR OF PLANNING JOHN BORGESI, PE - TOWN ENGINEER AMY MAXNER - CONSERVATION ADMINISTRATOR

INADVERTENT REFERENCE

TOWN OF NORTH ANDOVER, MA

















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OPERATION AND MAINTENANCE PLAN NORTH LAKE COCHICHEWICK BOAT LAUNCH TOWN OF NORTH ANDOVER

Bioretention Areas

Premature failure of bioretention areas is a significant issue caused by lack of regular maintenance. Ensuring long-term maintenance involves sustained public education and deed restrictions or covenants for privately owned cells. Bioretention areas require careful attention while plants are being established and seasonal landscaping maintenance thereafter. Table 1 shows the bioretention maintenance schedule below.

Table 1 Bioretention Maintenance Schedule				
Activity	Time of Year	Frequency		
Inspect and remove trash	Year round	Monthly		
Mulch	Spring	Annually		
Replace dead vegetation ¹	Spring	Annually		
Prune	Spring or Fall	Annually		
Replace entire media and all vegetation	Late Spring/early Summer	As needed ²		

1. See Planting List in Drawing Plans

2. Paying careful attention to operation and maintenance can extend the life of the soil media.

inspect soil and repair eroded areas monthly. Re-mulch void areas as needed. Remove litter and debris monthly. Treat diseased vegetation as needed. Remove and replace dead vegetation twice per year (spring and fall).

Remove invasive species as needed to prevent these species from spreading into the bioretention area. Replace mulch every two years, in the early spring. Upon failure, excavate bioretention area, scarify bottom and sides, replace filter fabric and soil, replant, and mulch. A summary of maintenance activities can be found in Table 1.

Because the soil medium filters contaminants from runoff, the cation exchange capacity of the soil media will eventually be exhausted. When the cation exchange capacity of the soil media decreases, change the soil media to prevent contaminants from migrating to the groundwater, or from being discharged via an underdrain outlet. Using small shrubs and plants instead of larger trees will make it easier to replace the media with clean material when needed.

Cold Climate Considerations

Never store snow in bioretention areas. The Operation and Maintenance plan must specify where on-site snow will be stored. All snow dumps must comply with MassDEP's guidance. When bioretention areas are located along roads, care must be taken during plowing operations to prevent snow from being plowed into the bioretention areas. If snow is plowed into the cells, runoff may bypass the cell and drain into downgradlent wetlands without first receiving the required water quality treatment, and without recharging the groundwater.

Permeable Pavers

Operation

Installation:

- Excavation: Excavate and compact the soil sub-grade.
- Base Preparation: Place and compact a gravel base, extending beyond the Turfstones by at least 6 inches for residential use and 8 inches for vehicle loads.
- Bedding Sand: Spread and screed bedding sand to proper elevations. Ensure uniform moisture content before placing the pavers.
- Placement: Lay the Turfstones with a minimum joint spacing of 1/16 inch.
- Vibration: Use a high-frequency, low-amplitude plate vibrator with a rubber mat to vibrate the Turfstones into the sand.

Maintenance

Regular Cleaning:

- Debris Removal: Sweep or blow off debris like leaves and dirt to prevent clogging2.
- Gentle Washing: Use a garden hose with a gentle spray nozzle for cleaning. Avoid pressure washing to prevent damage.

Weed Control:

Inspection: Regularly check for weeds and remove them manually or use natural herbicides.

Inspection After Storms:

• Drainage Check: Ensure the pavers are draining properly after heavy rains. Address any pooling water by cleaning or replenishing fill material.

Fill Material Maintenance:

• Replenishment: Over time, the fill material (soil or gravel) may displace. Replenish as needed to maintain permeability.

Snow and Ice Management:

 De-Icing: Use non-abrasive de-icing agents and avoid metal shovels to prevent surface damage. Annual Inspection:

• Thorough Check: Conduct a detailed inspection at least once a year to identify and repair any damage.

Rip-Rap

Operation

General Installation:

- Slte Preparation: Clear the area of vegetation and debrls. Excavate to the required depth and shape.
- Filter Layer: Place a filter fabric or a layer of gravel to prevent soil from moving through the rip-rap.
- Placement: Use a well-graded mixture of rock sizes. Place the largest stones at the bottom and work upwards, ensuring a stable and interlocked structure.

Maintenance

Regular Inspections:

- Annual Checks: Inspect the rip-rap at least once a year and after major storms to identify any displaced stones, slumping, or erosion at the edges.
- Post-Storm Inspections: Check for damage after heavy rains or storms. Promptly repair any damage to prevent further erosion.

Weed and Brush Control:

- Vegetation Management: Remove any weeds or brush that may grow between the rocks to maintain the Integrity of the rip-rap.
- Cleaning: Remove accumulated sediment and debris to ensure the rip-rap remains effective in controlling erosion.

Repair and Replacement:

- Damage Repair: If stones are displaced or the filter fabric is exposed, repair these areas immediately to prevent progressive failure.
- Replenishment: Add new stones as needed to maintain the structure's effectiveness.

Maintenance Budget (Planning Only)

Table 2		
Maintenance Budget		
Activity	Frequency	
Replace Plantings	\$100/ea	
Mulch	\$30/cy	
Grass	10/sy	
Replace entire media and all vegetation	\$100/cy	
Permeable Pavers	\$20/sf	
Rip-Rap	\$100/cy	
12" Drainage Pipe	\$200/lf	
Drainage Structures	\$5,000/ea	

*regular maintenance will be performed with Town forces.



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DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581 p: (508) 389-6300 | f: (508) 389-7890 MASS.GOV/MASSWILDLIFE



March 15, 2024

Jamie Veillette Environmental Partners Group, LLC 1900 Crown Colony Drive, Suite 402 Quincy, Massachusetts 02169

RE: Applicant: Jamie Veillette Project Location: Great Pond Road Project Description: North Lake Cochichewick Boat Launch NHESP File No.: 24-17147

Dear Applicant:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") received the MESA Project Review Checklist and supporting documentation for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

The MESA is administered by the Division, and prohibits the Take of state-listed species. The Take of state-listed species is defined as "in reference to animals...harm...kill...disrupt the nesting, breeding, feeding or migratory activity...and in reference to plants...collect, pick, kill, transplant, cut or process...Disruption of nesting, breeding, feeding, or migratory activity may result from, but is not limited to, the modification, degradation, or destruction of Habitat" of state-listed species (321 CMR 10.02).

The Division has determined that this Project, as currently proposed, will occur **within** the actual habitat of the following species:

Scientific Name	Common Name	Taxonomic Group	State Status
Ligumia nasuta	Eastern Pondmussel	Mussel	Special Concern

This species and their habitats are protected in accordance with the MESA.

Based on the information provided and the information contained in our database, the Division finds that a portion of this project, as currently proposed, <u>must be conditioned</u> to avoid a prohibited Take of state-listed <u>species (321 CMR 10.18(2)(a))</u>. To avoid a prohibited Take of state-listed species, the conditions attached to this letter must be met.

MASSWILDLIFE

<u>Provided the attached conditions are fully implemented and there are no changes to the project plans, this project</u> <u>will not result in a Take of state-listed species.</u> We note that all work is subject to the anti-segmentation provisions (321 CMR 10.16) of the MESA. This determination is a final decision of the Division of Fisheries and Wildlife pursuant to 321 CMR 10.18. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the Division pursuant to the MESA. This project may be subject to further review if no physical work is commenced within five years from the date of issuance of this determination, or if there is a change to the project.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions regarding this letter please contact Melany Cheeseman, Endangered Species Review Assistant, at Melany.Cheeseman@mass.gov, (508) 389-6357.

Sincerely,

Jesse Leddick Assistant Director

cc:

Attachment: List of Conditions

List of Conditions

Applicant:	Jamie Veillette
Project Location:	Great Pond Road
Project Description:	North Lake Cochichewick Boat Launch
NHESP File No.:	24-17147
Heritage Hub Form ID	: RC-84021
Approved Plan:	North Lake Cochichewick Boat Launch
	Plan date: January 2024 Revised Date: N/A

To avoid a prohibited Take of state-listed species, the following condition(s) must be met:

- 1. Limits of Work: No work or alteration to the soil, surface, or vegetation shall occur outside of the limits of work shown on the site plan unless otherwise approved in writing in advance by the Division.
- Restoration or Stabilization: The Division does not approve of the planting of state-listed species, even if the 2. seeds are sourced outside of Massachusetts. Please carefully review seed mixes at the time of purchase as the specific composition and mixes change within a year (https://www.mass.gov/info-details/list-of-endangered-threatened-and-special-concern-species#plants).
- 3. Mussel Protection: If the water surface is within 6 feet horizontally from any element of work within Land Under Water & Waterbodies or Bank, a one-time mussel sweep is required. Work includes all construction, reconstruction and any siltation control measures for this conditions. The mussel biologist will search all suitable habitat in areas of work, and a buffer area of the limit of work, for state-listed mussels and translocate them outside of the area subject to alteration.

a. State Listed Mussel Sweep: A mussel sweep shall be conducted immediately prior to the initiation of work. Mussels shall be located, identified, and moved to suitable habitat away from impacts associated with the project.

b. Pre-Approval: The Division must pre-approve the candidate biologist(s) prior to any Work subject to this condition. The ability to locate and identify state-listed mussels requires significant experience with the target mussel species. The resume/curriculum vitae of the candidate biologist, demonstrating extensive experience locating state-listed mussels, shall be sent to the Division for written pre-approval.

c. Collection Permit: The biologist must obtain a Commercial Scientific Collection Permit for this project site prior to conducting mussel sweeps. Commercial Scientific Collection Permit Application & filing fee information can be found at: https://www.mass.gov/doc/commercial-scientific-collection-permit-application/download. d. Survey Timing: Survey and relocation of mussels shall only occur between June 1 and October 1.

e. Reporting: The survey report, reporting positive or negative finding (aka 'fail to find') shall be submitted to the Division as outlined in the survey guidelines reporting all state-listed and watch-listed species. Please note that survey data must be submitted via the Heritage Hub

(https://www.mass.gov/info-details/overview-of-the-heritage-hub) within 10 days of the completion of the survey.

4. Compliance Report: Within thirty (30) days of the completion of work or as otherwise approved by the Division, the Applicant shall submit a brief written report to the Division documenting compliance with the condition(s) required herein, including representative photographs or supplemental documentation as necessary.

MASSWILDLIFE

Jamie Veillette

From:	Jamie Veillette
Sent:	Wednesday, September 25, 2024 2:46 PM
То:	Marold, Misty-Anne (FWE)
Cc:	Cheeseman, Melany (FWE)
Subject:	RE: [EXT] RE: MESA Project Review - North Lake Cochichewick Boat Launch

Apologies, I meant DFW in both cases.



From: Marold, Misty-Anne (FWE) <misty-anne.marold@mass.gov>
Sent: Wednesday, September 25, 2024 2:13 PM
To: Jamie Veillette <jlv@envpartners.com>
Cc: Cheeseman, Melany (FWE) <Melany.Cheeseman@mass.gov>
Subject: RE: [EXT] RE: MESA Project Review - North Lake Cochichewick Boat Launch

CAUTION

RE: 24-17147, North Lake Cochichewick Boat Launch

Hi Jamie,

Thank you for that explanation. Those changes do not change our March 2024 determination.

We can't speak for DMF, so you'll have to reach out them.

Misty-Anne

Misty-Anne R. Marold Senior Endangered Species Review Biologist

Massachusetts Division of Fisheries & Wildlife Natural Heritage & Endangered Species Program 1 Rabbit Hill Road, Westborough, MA 01581 p: (508) 389-6356 | f: (508) 389-7890 Email: <u>misty-anne.marold@mass.gov</u> mass.gov/nhesp| <u>facebook.com/masswildlife</u> *Due to volume and staffing, regulatory filings are anticipated to take the full 30-day period allotted by the regulations under the MESA and WPA. Pending review deadlines and recent decisions can be found on our website here: https://www.mass.gov/service-details/recent-mesa-decisions-permits-and-applications (updated weekly). Thank you.

From: Jamie Veillette <jlv@envpartners.com> Sent: Wednesday, September 25, 2024 1:54 PM To: Marold, Misty-Anne (FWE) < misty-anne.marold@mass.gov> Subject: RE: [EXT] RE: MESA Project Review - North Lake Cochichewick Boat Launch

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Hi Misty-Anne,

We are currently in the permitting phase of this project and plan to submit a combined Ch 91/401 WQC application soon. As part of the 401 WQC application, we are required to consult with DFW about TOY restrictions and provide documentation of additional consultation with DMF since the issuance of the determination letter (per 314 CMR 9.07(3)(d)).

Since the MESA review application in February 2024, the following revisions have been made to the design:

- Replaced the FEMA Flood Zone boundary with the preliminary FIRM panel #25009C0228G.
- Modified the retaining wall location (approximately ~2-ft north of original location) to meet the bordering land subject to flooding performance standards.

There are no changes to the limits of work and the conditions set forth in the determination letter will be followed to prevent a "prohibited take." Dredging shall be planned and conducted to minimize short-term, long-term, and cumulative impacts on the aquatic ecosystem.

Please let me know if you have any questions or require any additional information regarding the project.

Thank you,



Jamie L. Veillette Senior Project Engineer - An Apex Company - Environmental Partners envpartners.com f 🗇 🎔 in

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Maura T. Healey GOVERNOR

Kimberley Driscoll LIEUTENANT GOVERNOR

> Rebecca L. Tepper SECRETARY

The Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs 100 Cambridge Street, Suite 900 Boston, MA 02114

> Tel: (617) 626-1000 Fax: (617) 626-1081 http://www.mass.gov/eea

December 16, 2024

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS ON THE SINGLE ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: North Lake Cochichewick Boat Launch
PROJECT MUNICIPALITY	: North Andover
PROJECT WATERSHED	: Merrimack
EEA NUMBER	: 16850
PROJECT PROPONENT	: Town of North Andover
DATE NOTICED IN MONITOR	: November 8, 2024

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62L) and Section 11.08 of the MEPA regulations (301 CMR 11.00), I have reviewed the Single Environmental Impact Report (Single EIR) and hereby determine that it **adequately and properly** complies with MEPA and its implementing regulations.

Project Description

As described in the Single EIR, the Town of North Andover proposes site improvements at the existing boat ramp located on Great Pond Road. These improvements include the demolition of the existing paved boat launch, cobble and concrete retaining wall, and gravel parking area. The project includes the construction of a new hand-carry boat launch, a Mechanically Stabilized Earth (MSE) block wall, and permeable paver parking areas and a paved driveway apron. Additionally, two bioretention areas will be installed to manage stormwater, along with tree plantings. Security measures will include a double swing gate with locking bollards at the boat launch entrance to restrict access when the boat launch area is closed.

Changes Since the Expanded Environmental Notification Form (EENF)

Since the filing of the EENF, the Proponent has refined the project design to address comments from agencies and the public. Notable updates include replacing the FEMA Flood Zone mapping originally provided in the EENF with the preliminary Flood Insurance Rate Map (FIRM), panel #25009C0228G, dated February 20, 2023. Additionally, the proposed retaining wall was shifted approximately two feet north of its initial location to comply with Bordering Land Subject to Flooding (BLSF) performance standards. This adjustment offsets the conversion of 237 square feet of upland area converted to Land Under Waterbodies and Waterways (LUWW) by the addition of 237 square feet of flood storage area in front of the proposed retaining wall to ensure that there will be no overall loss of flood storage volumes on a foot-by-foot basis.

Project Site

The 0.74-acre project site is located on the north side of Lake Cochichewick¹ (the lake) on a parcel along Great Pond Road owned by the Town of North Andover (the Town). The site is situated across from 1939 Great Pond Road, in an area formerly occupied by the Town's North Sewer Pump Station, which was previously demolished and removed. The existing site includes a boat launch with a dirt/gravel driveway, boat racks, a deteriorating bituminous concrete launch extending into the lake, and an old cobble and concrete retaining wall along the lake's edge.

Wetland resource areas present in the vicinity of the project area include Boarding Vegetated Wetlands (BVW) Inland Bank (Bank), LUWW, and BLSF.

The North Lake Cochichewick Boat Launch project will occur within the mapped *Estimated or Priority Habitat of Rare Species* as delineated by the NHESP in the 15th Edition of the Massachusetts Natural Heritage Atlas. The Massachusetts Historical Commission (MHC) has determined that the project is unlikely to affect significant historic or archaeological resources listed in the State Register of Historic Places or the MHC's Inventory of Historic and Archaeological Assets of the Commonwealth. According to supplemental information submitted electronically on August 13, 2024 the proposed work is situated in a FEMA Flood Zone (FEMA Flood Zone A) where a specific Base Flood Elevation (BFE) has not been determined. The project is located within an Outstanding Resource Water (ORW), specifically Lake Cochichewick, which serves as the Town's drinking water supply. Lake Cochichewick is an impaired water body for mercury in fish tissue.

The project site is within one mile of an Environmental Justice (EJ) population characterized as Minority in the town of North Andover. The site is also located within five miles of multiple EJ populations characterized as Minority, Minority and Income, Minority and English Isolation, and Minority, Income and English Isolation, in the towns of Haverhill, Lawrence, Methuen, and North Andover. There are no languages spoken by 5% or more of residents within the EJ populations located within a 1-mile radius of the project site. As described below, the EENF identified the "Designated Geographic Area" (DGA) for the project as one mile around EJ populations, included a

¹ Lake Cochichewick is identified in the current "Massachusetts Great Ponds List" document available at www.mass.gov. 310 CMR 9.02 defines a great pond as "any pond which contained more than ten acres in its natural state, as calculated based on the surface area of lands lying below the natural high-water mark."

review of potential impacts and benefits to the EJ populations within this DGA, and described public involvement efforts undertaken to date.

Environmental Impacts and Mitigation

Potential environmental impacts associated with the project include the alteration of 202 linear feet (lf) of Bank, 4,838 square feet (sf) of LUWW, and 1,540 sf of BLSF. In addition, the project will include 63 cubic yards (cy) of improvement dredging to reconstruct the new boat launch and MSE block retaining wall, per the Single EIR.²

Measures to avoid, minimize, and mitigate environmental impacts include a proposed stormwater management system with two bioretention areas (rain gardens), designed to increase groundwater recharge, reduce scour to Lake Cochichewick, and improve water quality. Prior to the initiation of work, a search will be conducted by a biologist approved by the Massachusetts Division of Fisheries & Wildlife (DFW) for state-listed mussels, and mussels found during the search will be moved out of areas that will be altered by the project. The project will require Time of Year (TOY) restrictions for mussel surveys and relocation. The project will increase LUWW as a result of removing the existing boat launch and constructing the new boat launch and alterations to the bank needed to install the new MSE block wall. According to the Single EIR, the project includes a net decrease in impervious area of at least 5,000 sf through replacement of packed gravel with permeable pavers.

Construction-period mitigation measures will include the use of erosion and sediment controls, a turbidity curtain, and a cofferdam. Traffic during construction and daily operation associated with the project will primarily be routed along Great Pond Road and not within residential areas located in close proximity. According to the Single EIR, the traffic will generally avoid direct impacts to the EJ block groups within one mile of the project site.

Jurisdiction and Permitting

This project is subject to MEPA review and the preparation of an ENF pursuant to 301 CMR 11.03 (3)(b)(1)(c) of the MEPA regulations because it requires Agency Action and will result in the alteration of 1,000 or more sf of salt marsh or outstanding resource waters. The project is required to prepare an EIR under 301 CMR 11.06(7)(b) of the MEPA regulations because it is located within one mile of one or more EJ populations. The project will require a Combined Chapter 91 License and 401 Water Quality Certification from the Massachusetts Department of Environmental Protection (MassDEP), a Massachusetts Endangered Species Act (MESA) Project Review by NHESP, and submittal of a Project Notification to the Massachusetts Historical Commission (MHC).

The project received an Order of Conditions (OOC) from the North Andover Conservation Commission, dated December 13, 2024. The North Andover Planning Board issued a Watershed Special Permit dated October 22, 2024, pursuant to the North Andover Zoning Bylaw and M.G.L. C. 40A, Sec. 9, for the proposed project. The project will also require the submittal of a Pre-Construction

² The Single EIR provided updates to potential environmental impacts associated with the project.

Notification (PCN) to the U.S. Army Corps of Engineers (ACOE) seeking authorization under the General Permits for Massachusetts in accordance with Section 404 of the Clean Water Act.

Because the project is not seeking Financial Assistance from an Agency, MEPA jurisdiction for any future reviews would extend to those aspects of the project that are within the subject matter of required or potentially required permits, and that are likely, directly or indirectly, to cause Damage to the Environment.

Review of the Single EIR

The Single EIR was responsive to the Scope issued on the EENF. It included a project description including project changes since the filing of the EENF, revised plans of existing and updated proposed conditions, stormwater report, draft Section 61 Findings, and an update on permitting requirements for the project. It provided an update on outreach to EJ populations conducted since the filing of the EENF. It included a response to comments received on the EENF.

The Proponent submitted additional information on December 9, 2024, which included updates on NHESP consultation confirming that revisions to the project design did not alter NHESP's initial determination, details on public hearings and comments received, updates to project plans such as revised labeling for sediment control measures and tree placement, and a summary of the updated EJ criteria analysis for childhood blood lead levels and low birth weight at the census tract level. The email also included additional information on the dismissal of vegetated alternatives for slope stabilization and retaining walls, citing factors such as wave action, structural instability, and longterm maintenance challenges. The Proponent also outlined construction-period compliance measures, including sediment control, dewatering operations, and material disposal practices. The additional information also addressed BLSF impacts and mitigation. This additional information is further discussed below. All supplemental materials provided by the Proponent are included in references to the "Single EIR," unless otherwise indicated.

Alternatives Analysis

The Single EIR included a supplemental alternatives analysis evaluating alternative designs and materials that could provide similar functional benefits as the alternatives proposed in the EENF. This was provided in response to scoping in the Wetlands section of the EENF Certificate. The analysis considered the feasibility of incorporating systems that enhance wildlife habitat connectivity, improve water quality, and assess impacts to wetland resources, stormwater, safety, accessibility, and resiliency. As described below, the Single EIR included a retaining wall alternatives analysis and a slope stabilization alternatives analysis. Additionally, the Single EIR included a boat launch alternatives analysis, a driveway and parking area alternatives analysis and a stormwater infrastructure alternatives analysis; however, these were not requested in the Scope and the selected preferred alternative remains as listed in the EENF.

The Retaining Wall Alternatives Analysis included a MSE Concrete Block Wall Alternative (Preferred Alternative), a Vegetated Retaining Wall Alternative, and a No-Alternation Alternative as described further below:

- The MSE Concrete Block Wall (Preferred Alternative) involves replacing the failing concrete wall with a modular precast block wall. According to the Single EIR this alternative offers long-term stability, resiliency, and aesthetics, with shorter construction impacts. According to the Single EIR, the wall type is consistent with the existing structure and is better suited to withstand the lake's high wave action, reducing maintenance needs and the risk of future failures.
- The Vegetated Retaining Wall Alternative consists of the use of a mechanically stabilized earth wall vegetated with plant plugs, tree stakes, or seed mix to provide bank habitat. According to the Single EIR, the lake's severe wave action would undermine its long-term stability. Additionally, as noted in the analysis, the Town lacks the resources for the consistent maintenance required to ensure its success. For these reasons this alternative was dismissed by the Proponent.
- The No-Alteration Alternative would result in leaving the existing failing wall in place, which, according to the Single EIR, would lead to further degradation, with concrete debris and backfill material continuing to migrate into the lake, resulting in significant environmental impacts. For these reasons this alternative was dismissed by the Proponent.

The MSE Concrete Block Wall was selected by the Proponent as the preferred option due to its ability to provide structural integrity, long-term durability, and minimized environmental impacts compared to the other options.

The Slope Stabilization Alternatives Analysis included a Rip Rap Alternative (Preferred Alternative), a Vegetated Cover Alternative, and a No-Alternation Alternative, as described further below:

- The Rip Rap Alternative (Preferred Alternative) consists of placing large stones or boulders along the slope to absorb wave energy and protect the slope from further erosion. According to the Single EIR, this method effectively addresses the severe wave action on Lake Cochichewick, which has caused significant erosion along its banks. The analysis determined that this alternative would reduce maintenance needs and prevent future erosion, making it the preferred option.
- The Vegetated Cover Alternative involves planting native grasses, shrubs, and trees to stabilize the soil through their root systems. According to the Single EIR, while this option provides good habitat for the lake bank, the severe wave action on Lake Cochichewick would undermine its long-term stability. Additionally, the Town lacks the resources for the consistent maintenance required to ensure its success. For these reasons, this alternative was dismissed by the Proponent.
- The No-Alteration Alternative would leave the erosion unaddressed, which, according to the Single EIR, is already significantly reducing the landmass. Concrete debris is visible in the lake, and unchecked erosion would increase the cost and difficulty of implementing effective solutions in the future. For these reasons, this alternative was dismissed by the Proponent.

The Rip Rap Alternative was selected by the Proponent as the preferred option due to its ability to provide long-term slope stabilization, reduce maintenance needs, and prevent further erosion at the project site.

Environmental Justice (EJ) / Public Health

As noted above, the project site is within one mile of an Environmental Justice (EJ) population characterized as Minority in the town of North Andover. The site is also located within five miles of multiple EJ populations characterized as Minority, Minority and Income, Minority and English Isolation, and Minority, Income and English Isolation, in the towns of Haverhill, Lawrence, Methuen, and North Andover. There are no languages spoken by 5% or more of residents within the EJ populations located within a 1-mile radius of the project site.

In accordance with the Scope, the Proponent distributed the Single EIR or a summary thereof and an EJ Screening Form to all Community-Based Organizations (CBOs) and tribes listed on an updated "EJ Reference List" obtained from the MEPA Office. The EJ Screening Form included contact information for requesting a meeting with the Proponent. According to the Single EIR, no parties, including those who received the EJ Screening Form, requested a meeting. Additionally, the Proponent published a project status update in the *Eagle Tribune* in August 2024, which also provided notice of a North Andover Planning Board public hearing held on September 10, 2024. According to the Single EIR, the North Andover Planning Board issued a Watershed Special Permit for project work within the Lake Cochichewick Watershed Protection District, on October 22, 2024. In addition, the Proponent held meetings with the North Andover Conservation Commission to review the preliminary site design and incorporated feedback from the Commission and the public into the site design. According to the Single EIR, the Proponent will continue to include the EJ Reference List on all future correspondence.

In accordance with the Scope, the Proponent provided an update of the baseline assessment of existing conditions in the identified EJ population by providing "vulnerable health EJ criteria" for childhood blood lead and low birth weight at the census tract level³ in the DPH EJ Tool.⁴ As noted in the update, the statewide elevated blood lead level rate from 2019-2023 was 14.1 cases per 1,000 individuals. At the community level, North Andover reported a rate of 5.2 cases per 1,000, which is below 110% of the statewide rate. Within census tract 2531, which includes one EJ block group, no cases were reported from 2015-2019.

Wetlands

As noted above, the project received an Order of Conditions (OOC) from the North Andover Conservation Commission, dated December 13, 2024. As a result of the Conservation Commission review process, several changes were made to the project plans as summarized below:

³ Update on "vulnerable health EJ criteria" for childhood blood lead and low birth weight at the census tract level provided by Jamie Veillette, Sr. Project Engineer, to Matthew Sokop, MEPA Analyst, dated December 12, 2024. ⁴ See https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html. Four

vulnerable health EJ criteria are tracked at the municipal level in the DPH EJ Viewer (heart attack hospitalization, childhood asthma, childhood blood lead, and low birth weight); of these, two (childhood blood lead and low birth weight) are also available at the census tract level.

- Updated project plans include a note to install a silt sack in the existing catch basin to help control sediment during construction.
- Test pit locations from October 2024 are now depicted on the project plans.
- The proposed construction entrance detail was revised on the project plans to provide a minimum length of 30 feet.
- Bioretention areas are now labeled as infiltration basins with a minimum of 2 feet of separation from the estimated seasonal high groundwater elevation.
- Planting list and notes have been updated on the project plans, indicating the removal and replacement of 17 trees. Tree locations have been adjusted to avoid infiltration basins, and all proposed shrubs have been removed from the infiltration basins.
- Boat launch ramp details revised to include special soil reinforcing grid material beneath paver units with a gravel aggregate layer to make the ramp stronger and more durable.

As noted above, the Single EIR included an alternative designs and materials analysis to identify design materials that could provide similar functional benefits while minimizing environmental impacts for the proposed MSE block wall and stone rip rap. The Single EIR evaluated alternatives to minimize environmental impacts while meeting project goals for structural stability, safety, and resiliency. The preferred alternatives, including the MSE Concrete Block Wall and Rip Rap, were selected for their effectiveness in addressing site-specific conditions such as severe wave action and erosion. Alternative options, such as vegetated solutions and no-alteration approaches, were dismissed due to insufficient durability.

As outlined in the "Changes to EENF" section, the Proponent has revised the location of the proposed retaining wall, shifting it approximately two feet north (landward) of its original placement. This adjustment was made to comply with the performance standards for BLSF. The proposed work occurs in the FEMA Flood Zone A. ⁵ The total area of work within the resource area is 1,540 sf. The proposed construction of the retaining wall and associated grading will have permanent impacts to BLSF. Specifically, 237 square feet of upland area will be converted to land under water body. However, this impact will be offset by the addition of 237 square feet of flood storage area in front of the proposed retaining wall. As a result, there will be no overall net change to the BLSF area. The 22,310 sf of BLSF initially included in the EENF was revised to 22,472 sf by the Proponent and initially included impacts to LUW area. The revised BLSF number (1,540 sf) excludes impacts to LUW area. Flood storage volumes are detailed on a foot-by-foot basis, as shown in Table 1 below.⁶

Table 1: Flood Storage Volume Summary

⁵ FEMA-designated Flood Zone shown on the preliminary FEMA Flood Insurance Rate Map (FIRM) panel #25009C0228G, dated February 20, 2023.

⁶ Email from Jamie Veillette, Sr. Project Engineer, to Matthew Sokop, MEPA Analyst dated December 13, 2024.

Elevation	Existing Incremental Area (SF)	Existing Incremental Volume (CF)	Proposed Incremental Area (SF)	Proposed Incremental Volume (CF)	Net Incremental Volume (CF) (Proposed Vol Existing Vol.)	Total Incremental Volume (CF)
111.0-112.0	194.0	194.0	334.0	334.0	140.0	140.0
112.0-113.0	278.0	278.0	378.0	378.0	100.0	240.0
113.0-114.0	325.0	325.0	454.0	454.0	129.0	369.0
114.0-115.0	288.0	288.0	288.0	288.0	0.0	369.0
115.0-116.0	234.0	58.5	59.0	59.0	0.5	369.5
TOTAL	1319.0	1143.5	1513.0	1513.0	369.5	

Correspondence from the MassDEP, Waterways Program, refers to comments issued on the EENF which note that Lake Cochichewick, is in geographic areas subject to jurisdiction pursuant to 310 CMR 9.04(1)(a) (Waterways Regulations), and that the project requires a Chapter 91 License, and notes that there are no further comments on the EIR. The Single EIR indicates that a BRP WW 26: Combined Chapter 91 and 401 Water Quality Certification License was submitted on October 07, 2024.

Rare Species

In accordance with the Scope, the Single EIR detailed the proposed measures that will be implemented to avoid, minimize, and mitigate potential impacts to state-listed species. According to the Single EIR, measures will be taken by the Proponent to prohibit the Take of state-listed species, specifically, the Eastern Pondmussel (*Ligumia nasuta*) based on the conditions outlined in the NHESP review letter (File No. 24-17147). These conditions require that no work or alterations occur outside the designated limits of work shown on the site plan unless approved in advance by NHESP. Additionally, restoration activities must avoid using state-listed plant species, including seeds sourced from outside Massachusetts, and seed mixes must be carefully reviewed for compliance. For work occurring within six feet horizontally of the water surface in LUWW or Bank, a one-time mussel sweep must be conducted by a qualified, NHESP-approved biologist who will relocate state-listed mussels to suitable habitat. The biologist must obtain a Commercial Scientific Collection Permit before the sweep, which must occur between June 1 and October 1. All findings must be reported to NHESP within 10 days of the survey via NHESP "Heritage Hub". Additionally, a compliance report documenting adherence to these conditions must be submitted to NHESP within 30 days of completing the work and include representative photographs or supplemental documentation as necessary.

The Single EIR described the habitat of the state-listed species anticipated to be impacted or altered as a result of the project which generally encompasses the footprint of Lake Cochichewick an area mapped as Priority Habitat and Estimated Habitat for the Eastern Pondmussel as delineated by NHESP in the 15th Edition of the Massachusetts Natural Heritage Atlas. Additionally, the Single EIR included an update on consultation with NHESP regarding the modified retaining wall location (approximately ~2-ft north of original location) which indicated that the revision does not change NHESP's March 2024 determination.

Comments received from NHESP note that the project was reviewed under the Massachusetts Endangered Species Act (MESA) (M.G.L. c.131A and 321 CMR 10.00) on March 15, 2024, with conditions established to avoid impacts to state-listed mussels. Comments from NHESP confirm that the Single EIR is consistent with the project as reviewed in March 2024 and maintains its original MESA determination. Additionally, comments note that if the project requires review under the Wetlands Protection Act, NHESP will review the Notice of Intent (NOI) pursuant to 310 CMR 10.59.

Construction Period

In accordance with the Scope, the Single EIR identifies all areas designated for temporary construction access and staging. Access to the project site will be provided through a construction entrance located at the existing site entrance. A temporary construction entrance, as depicted in the erosion control and dewatering plan included in the Single EIR, will be constructed using a 6-inch layer of crushed rock placed on a clean base material free of organics and topsoil. The entrance will be sloped away from the roadway edge to ensure that stormwater runoff remains on-site.

The Single EIR addresses the timing of construction activities to ensure compliance with TOY restrictions. Specifically, the Single EIR references the TOY restriction for mussel surveys and relocations. These restrictions require that surveys and relocations of mussels occur only between June 1 and October 1. A mussel sweep must be conducted immediately prior to the initiation of work, during which mussels will be identified, relocated, and placed in suitable habitat outside the area of project impacts.

According to the Single EIR, the planned dewatering and measures to mitigate impacts on state-listed species work will comply with the conditions outlined in the NHESP review letter included in the EENF to avoid a prohibited "take." These conditions include:

- Observing a TOY restriction for dewatering.
- Conducting a mussel sweep prior to the initiation of work (June 1 to October 1).
- Submitting a compliance report within 30 days of project completion.

To further mitigate impacts on state-listed species, the contractor will implement additional measures, as discussed in the Single EIR. These include:

- Utilizing cofferdams designed to a maximum elevation of 116 feet NAVD88.
- Following a dewatering plan, stamped by a Massachusetts Professional Engineer, that details the pumping system, sediment control methods, and emergency response procedures.
- Monitoring discharges throughout construction and collaborating with the project engineer to identify and implement additional environmental protection measures, if necessary.

The Single EIR notes dredged material will be disposed off-site in accordance with the Massachusetts Bureau of Waste Prevention (BWP) Policy #BWP-94-037, MassDEP water quality certification (WQC) of dredging projects under 314 CMR 9.00, and Interim Policy COMM-94-007: Dredged Sediment Reuse or Disposal. Additionally, as described in the Single EIR, construction contractors will be required to prohibit the excessive idling during the construction period; no idle time

greater than 5 min. The contractor will be required to submit a plan for anti-idling and emissions limiting measures.

Mitigation/Draft Section 61 Findings

The Single EIR provides final mitigation commitments and draft Section 61 Findings for use by Agencies, which are summarized below. The Section 61 Findings should be provided to Agencies to assist in the permitting process and issuance of final Section 61 Findings.

Environmental Justice (EJ) / Public Health

- Prohibit excessive idling of construction equipment (greater than 5 minutes).
- Construction traffic routed along Great Pond Road and not within residential areas to avoid direct impacts to the EJ block groups within the DGA.

Stormwater

- Use Best Management Practices (BMPs) to limit turbidity and protect water quality.
- Install bioretention areas for stormwater treatment and storage.
- Provide Low Impact Development (LID) bioretention areas.
- Use permeable pavers for the new ramp, driveways, and parking lot.
- Reduce overall impervious area.

Wetlands

- Including native plantings in bioretention areas.
- Restore buffer zones to pre-existing conditions as applicable.
- Install and maintain erosion and sediment controls for wetland resource protection.
- Use turbidity curtain and cofferdam within North Lake Cochichewick.
- Implement and monitor a dewatering plan, maintaining groundwater levels 2 feet below all excavations, and treat discharged water using filter fabric, silt bags, and frac tanks or equivalent systems before release.
- Conduct dredging in compliance with permit conditions.
- Dispose of dredged material off-site according to local and state regulations.
- Stabilize banks using MSE block walls and rip-rap to protect against wave action and prevent further erosion.

Rare Species

- Schedule construction to comply with time-of-year (TOY) restrictions for mussel surveys and relocation.
- Conduct a mussel sweep by a qualified biologist to relocate mussels to suitable habitats.
- Submit a compliance report post-construction documenting initial and final site conditions.

Climate Change

- Reduce overall impervious area.
- Plant native trees, including within the bioretention areas, to mitigate for extreme heat.

• Stormwater system sized to reduce peak flow for the 2-year (3.16 inch), 10-year (5.0 inch), and 100-year (7.93) 24 hour storms (NOAA Atlas 14) and the 2070 10-year (6.8 inch) design storm recommended in the output report from the Climate Resilience Design Standards Tool.

Construction Period

- Install sedimentation control measures, including filter socks, silt sacks, turbidity curtains, and cofferdams, to prevent runoff into sensitive areas and isolate construction zones for dry work conditions.
- Inspect and maintain erosion and sediment controls daily during construction.
- Store aggregate materials on plastic liners with surrounding hay bales or filter socks and cover unsuitable materials for appropriate disposal.
- Use turbidity curtain and cofferdam within North Lake Cochichewick.
- Implement and monitor a dewatering plan, maintaining groundwater levels 2 feet below all excavations, and treat discharged water using filter fabric, silt bags, and frac tanks or equivalent systems before release.
- Conduct dredging operations with sediment control measures and dispose of dredged materials in compliance with Massachusetts regulations.
- Develop and implement a spill contingency plan to manage accidental releases of hazardous materials, including providing secondary containment for bypass pumping systems.
- Monitor discharges throughout the construction period to ensure compliance with applicable standards.

Conclusion

Based on a review of the Single EIR, comment letters, and in consultation with Agencies, I find that the Single EIR adequately and properly complies with MEPA and its implementing regulations. No further MEPA review is required, and the project may proceed to permitting. Participating Agencies should forward copies of the final Section 61 Findings to the MEPA Office for publication in accordance with 301 CMR 11.12.

December 16, 2024 Date

Rebecca L. Tepper

Comments received:

- 11/21/2024 Massachusetts Division of Fisheries and Wildlife (DFW) Natural Heritage and Endangered Species Program (NHESP)
- 12/10/2024 Massachusetts Department of Environmental Protection (MassDEP)

RLT/MJS/mjs



Matthew.J.Sokop@mass.gov

View Comment

Comment Details	
EEA #/MEPA ID 16850	
Comments Submit Date	
Certificate Action Date 12-9-2024	
Reviewer Matthew Sokop, , matthew.j.sokop@mass.gov	
First Name Misty-Anne	
Last Name Marold	
Phone	
Email misty-anne.marold@mass.gov	
Address Line 1 1 Rabbit Hill Road	
Address Line 2	
State MASSACHUSETTS	
Zip Code 01581	
Organization MA Division of Fisheries and Wildlife - NHESP	
Affiliation Description State Agency	
Status Accepted	
Comment Title or Subject	
Topic: Comments on North Lake Cochichewick Boat Launch	
Comments	
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On March 15, 2024, the MA Division of Fisheries and Wildlife issued a determination for this project pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00). The MESA determination required conditions to avoid impact to state-listed mussels. We reviewed the SEIR and find it consistent with the project the Division reviewed in March 2024 and submit our MESA determination to stand in for comments. If the project is subject to review under the MA Wetlands Protection Act, the Division is required to review the Notice of Intent pursuant to 310 CMR 10.59.

Attachments RC-84021_North Andover.pdf(null)

ι	Jpdate Status	
	Status	
	Accepted	~

https://eeaonline.eea.state.ma.us/EEA/PublicComment/UI/reviewcomment/2a792771-9551-4adc-8cb9-cbc0ff712aec

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https://eeaonline.eea.state.ma.us/EEA/PublicComment/UI/reviewcomment/2a792771-9551-4adc-8cb9-cbc0ff712aecable active ac

DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581 p: (508) 389-6300 | f: (508) 389-7890 MASS.GOV/MASSWILDLIFE



March 15, 2024

Jamie Veillette Environmental Partners Group, LLC 1900 Crown Colony Drive, Suite 402 Quincy, Massachusetts 02169

RE: Applicant: Jamie Veillette Project Location: Great Pond Road Project Description: North Lake Cochichewick Boat Launch NHESP File No.: 24-17147

Dear Applicant:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") received the MESA Project Review Checklist and supporting documentation for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

The MESA is administered by the Division, and prohibits the Take of state-listed species. The Take of state-listed species is defined as "in reference to animals...harm...kill...disrupt the nesting, breeding, feeding or migratory activity...and in reference to plants...collect, pick, kill, transplant, cut or process...Disruption of nesting, breeding, feeding, or migratory activity may result from, but is not limited to, the modification, degradation, or destruction of Habitat" of state-listed species (321 CMR 10.02).

The Division has determined that this Project, as currently proposed, will occur **within** the actual habitat of the following species:

Scientific Name	Common Name	Taxonomic Group	State Status
Ligumia nasuta	Eastern Pondmussel	Mussel	Special Concern

This species and their habitats are protected in accordance with the MESA.

Based on the information provided and the information contained in our database, the Division finds that a portion of this project, as currently proposed, <u>must be conditioned</u> to avoid a prohibited Take of state-listed <u>species (321 CMR 10.18(2)(a))</u>. To avoid a prohibited Take of state-listed species, the conditions attached to this letter must be met.

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<u>Provided the attached conditions are fully implemented and there are no changes to the project plans, this project</u> <u>will not result in a Take of state-listed species.</u> We note that all work is subject to the anti-segmentation provisions (321 CMR 10.16) of the MESA. This determination is a final decision of the Division of Fisheries and Wildlife pursuant to 321 CMR 10.18. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the Division pursuant to the MESA. This project may be subject to further review if no physical work is commenced within five years from the date of issuance of this determination, or if there is a change to the project.

Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions regarding this letter please contact Melany Cheeseman, Endangered Species Review Assistant, at Melany.Cheeseman@mass.gov, (508) 389-6357.

Sincerely,

Jesse Leddick Assistant Director

cc:

Attachment: List of Conditions

List of Conditions

Applicant:	Jamie Veillette				
Project Location:	Great Pond Road				
Project Description:	North Lake Cochichewick Boat Launch				
NHESP File No.:	24-17147				
Heritage Hub Form ID	: RC-84021				
Approved Plan:	North Lake Cochichewick Boat Launch				
	Plan date: January 2024 Revised Date: N/A				

To avoid a prohibited Take of state-listed species, the following condition(s) must be met:

- 1. Limits of Work: No work or alteration to the soil, surface, or vegetation shall occur outside of the limits of work shown on the site plan unless otherwise approved in writing in advance by the Division.
- Restoration or Stabilization: The Division does not approve of the planting of state-listed species, even if the 2. seeds are sourced outside of Massachusetts. Please carefully review seed mixes at the time of purchase as the specific composition and mixes change within a year (https://www.mass.gov/info-details/list-of-endangered-threatened-and-special-concern-species#plants).
- 3. Mussel Protection: If the water surface is within 6 feet horizontally from any element of work within Land Under Water & Waterbodies or Bank, a one-time mussel sweep is required. Work includes all construction, reconstruction and any siltation control measures for this conditions. The mussel biologist will search all suitable habitat in areas of work, and a buffer area of the limit of work, for state-listed mussels and translocate them outside of the area subject to alteration.

a. State Listed Mussel Sweep: A mussel sweep shall be conducted immediately prior to the initiation of work. Mussels shall be located, identified, and moved to suitable habitat away from impacts associated with the project.

b. Pre-Approval: The Division must pre-approve the candidate biologist(s) prior to any Work subject to this condition. The ability to locate and identify state-listed mussels requires significant experience with the target mussel species. The resume/curriculum vitae of the candidate biologist, demonstrating extensive experience locating state-listed mussels, shall be sent to the Division for written pre-approval.

c. Collection Permit: The biologist must obtain a Commercial Scientific Collection Permit for this project site prior to conducting mussel sweeps. Commercial Scientific Collection Permit Application & filing fee information can be found at: https://www.mass.gov/doc/commercial-scientific-collection-permit-application/download. d. Survey Timing: Survey and relocation of mussels shall only occur between June 1 and October 1.

e. Reporting: The survey report, reporting positive or negative finding (aka 'fail to find') shall be submitted to the Division as outlined in the survey guidelines reporting all state-listed and watch-listed species. Please note that survey data must be submitted via the Heritage Hub

(https://www.mass.gov/info-details/overview-of-the-heritage-hub) within 10 days of the completion of the survey.

4. Compliance Report: Within thirty (30) days of the completion of work or as otherwise approved by the Division, the Applicant shall submit a brief written report to the Division documenting compliance with the condition(s) required herein, including representative photographs or supplemental documentation as necessary.

MASSWILDLIFE

Sokop, Matthew J (EEA)

From:	Waterways, DEP (DEP)
Sent:	Tuesday, December 10, 2024 10:02 AM
То:	Sokop, Matthew J (EEA)
Subject:	Fw: EEA 16850 Chapter 91 Comments
Attachments:	EEA16850_Ch91 Comments.pdf

Please see attached for the comments on the EENF. There are no further comments from the c.91 program for the EIR. Thank you,

Chapter 91 Waterways Program Massachusetts Department of Environmental Protection 100 Cambridge Street, 9th Floor | Boston, MA 02114 • 617-292-5929 | Email - <u>DEP.Waterways@mass.gov</u>

Waterways Regulation Program Email: <u>DEP.Waterways@mass.gov</u> Review Current Applications: <u>Search EEA Projects (state.ma.us)</u> Chapter 91 Application and Filing Forms and Instructions: <u>https://www.mass.gov/lists/chapter-91-forms</u> Visit MassDEP Waterways Regulation Program on the Web: <u>https://www.mass.gov/waterways-program-chapter-91</u>

From: Waterways, DEP (DEP) <dep.waterways@mass.gov>
Sent: Wednesday, August 7, 2024 3:22 PM
To: Sokop, Matthew J (EEA) <Matthew.J.Sokop@mass.gov>
Subject: EEA 16850 Chapter 91 Comments

Please see the attached comments. If you have any questions please let us know. Thank you,

Chapter 91 Waterways Program Massachusetts Department of Environmental Protection 100 Cambridge Street, 9th Floor | Boston, MA 02114 • 617-292-5929 | Email - <u>DEP.Waterways@mass.gov</u>

Waterways Regulation Program Email: <u>DEP.Waterways@mass.gov</u> Review Current Applications: <u>Search EEA Projects (state.ma.us)</u> Chapter 91 Application and Filing Forms and Instructions: <u>https://www.mass.gov/lists/chapter-91-forms</u> Visit MassDEP Waterways Regulation Program on the Web: <u>https://www.mass.gov/waterways-program-chapter-91</u>



Department of Environmental Protection

100 Cambridge Street 9th Floor Boston, MA 02114 • 617-292-5500

Maura T. Healey Governor

Kimberley Driscoll Lieutenant Governor Rebecca L. Tepper Secretary

> Bonnie Heiple Commissioner

Memorandum

To:	Matthew Sokop, Environmental Analyst, MEPA				
From:	Waterways Regulation Program, MassDEP				
cc:	Daniel J. Padien, Program Chief, Waterways Regulation Program, MassDEP				
Re:	Lake Cochichewick Boat Launch EEA #16850 – EENF Comments from the Chapter 91 Waterways Regulation Program				
	1 20 2024				

Date: July 30 2024

The Department of Environmental Protection Waterways Regulation Program (the "Department") has reviewed the above referenced Expanded Environmental Notification Form (EENF) #16850 submitted on behalf of the Town of North Andover (the "Proponent") for a boat launch (the "Project") at Great Pond Road in the Town of North Andover.

Chapter 91 Jurisdiction

Portions of the proposed project will occur within the waters of Lake Cochichewick, a geographic areas subject to jurisdiction pursuant to 310 CMR 9.04(1)(a).

Regulatory Review

As noted in the EENF, the Project requires a Chapter 91 license, as the scope of work includes dredging and the installation of structures within Chapter 91 jurisdictional areas. The Department did not identify concerns regarding the proposed project and looks forward to submittal of a WW01 Water-Dependent License Application after completion of the MEPA process and that includes the minimum necessary filing requirements.

If there are any questions regarding the Department's comments, please contact us at <u>dep.waterways@mass.gov</u>.



March 19, 2025

Regulatory Division File Number: NAE-2024-02012

John J. Borgesi North Andover Department of Public Works 384 Osgood Street North Andover, Massachusetts 01845 (Via Email): jborgesi@northandoverma.gov

Dear John Borgesi:

This regards your application submitted to the U.S. Army Corps of Engineers (USACE) to permanently impact 812 square feet and temporarily impact 5,662 square feet of area below the Ordinary High Water (OHW) mark to repair and modify an existing boat launch. 42.2 cubic yards of material will be dredged from 562 square feet of the area along the lake bank. The dredged area will be backfilled by 45.5 cubic yards of fill to facilitate the boat launch. 20.8 cubic yards of existing slope stabilization material will be dredged from 250 square feet of area which will be backfilled by 21.3 cubic yards of native rock. Approximately 5,662 square feet of area will be in the dry for a duration of 1.5 months. Turbidity curtains will be installed for the duration of all in-water work. This project is located in Lake Cochichewick, Great Pond Road, North Andover, Massachusetts 01845 at approximate site coordinates 42.714537, -71.112686. The work is shown on the enclosed plans titled "NORTH LAKE COCHICHEWICK BOAT LAUNCH," on a total of 14 sheets, and dated "JULY 2024."

Based on the information that you have provided, we verify that the activity is authorized under General Permit # 5 and # 9 of the June 2, 2023, federal permit known as the Massachusetts General Permits (GPs). The GPs are available at https://www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Massachusetts-General-Permit.

Please review the enclosed GPs carefully, in particular the general conditions beginning on page 35, and ensure that you and all personnel performing work authorized by the GPs are fully aware of and comply with its terms and conditions. A copy of the GPs and this verification letter shall be available at the work site as required by General Condition 17. You must perform this work in compliance with the following special condition(s):

1) All construction shall be completed in accordance with the limits of construction and construction sequences detailed on the enclosed plan drawings, titled "NORTH LAKE COCHICHEWICK BOAT LAUNCH," on a total of 14 sheets, and dated "JULY 2024." If you change the plans or construction methods for work within or adjacent to the Cochichewick Lake, please contact us immediately to discuss modification of this authorization. The Corps of Engineers must approve any changes before you undertake them.

- 2) You must complete and return the enclosed Work Start Notification Form to this office at least two weeks before the anticipated start date. The form shall be emailed to Maninder Singh at <u>Maninder.Singh@usace.army.mil</u> and <u>cenae-r@usace.army.mil</u>; or mailed to Maninder Singh, Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.
- 3) You must complete and return the enclosed Compliance Certification Form to this office within one month of the completion of work. The form shall be emailed to Maninder Singh at <u>Maninder.Singh@usace.army.mil</u> and <u>cenae-</u> <u>r@usace.army.mil</u>; or mailed to Maninder Singh, Regulatory Division, U.S. Army Corps of Engineers, New England District, 696 Virginia Road, Concord, Massachusetts 01742-2751.
- 4) Turbidity curtains shall be installed for the duration of all in-water work and shall be maintained in working condition.

This authorization expires on June 1, 2028. You must commence or have under contract to commence the work authorized herein by June 1, 2028, and complete the work by June 1, 2029. If not, you must contact this office to determine the need for further authorization and we recommend you contact us *before* the work authorized herein expires. Please contact us immediately if you change the plans or construction methods for work within our jurisdiction as we must approve any changes before you undertake them. Performing work within our jurisdiction that is not specifically authorized by this determination or failing to comply with the special condition(s) provided above or all the terms and conditions of the GPs may subject you to the enforcement provisions of our regulations.

This authorization does not obviate the need to obtain other federal, state, or local authorizations required by law. Applicants are responsible for applying for and obtaining any other approvals.

We continually strive to improve our customer service. To better serve you, we would appreciate your completing our Customer Service Survey located at https://regulatory.ops.usace.army.mil/customer-service-survey.

Please contact Maninder Singh of my staff at (978) 318-8967 or (978)-257-6884 or

Maninder.Singh@usace.army.mil if you have any questions.

Sincerely,

Paul Maniccia

Paul Maniccia Chief, Massachusetts Section Regulatory Division

Enclosures

Cc:

Jamie Veillette, Apex Companies, LLC; <u>Jamie.Veillette@apexcos.com</u> Ed Reiner, U.S. EPA, Region 1, Boston, MA, <u>reiner.ed@epa.gov</u> Jill Provencal, DEP NERO, Wetland and Waterways, Wilmington, MA; <u>jill.provencal@state.ma.us</u> Kristin Divris, DEP NERO, Wetland and Waterways, Wilmington, MA; <u>Kristin.Divris@mass.gov</u> Philip Di Pietro, DEP NERO, Wetland and Waterways, Wilmington, MA; <u>philip.dipietro@mass.gov</u> Michael Stroman, DEP, Wetlands Program; <u>michael.stroman@mass.gov</u>

Michael Stroman, DEP, Wetlands Program; <u>michael.stroman@mass.gov</u> David Robinson, MA Board of Underwater Archaeological Resources (BUAR); david.s.robinson@mass.gov [THIS PAGE IS INTENTIONALLY LEFT BLANK]

NORTH LAKE COCHICHEWICK **BOAT LAUNCH**

TOWN OF NORTH ANDOVER, MA

C-1 EXISTING CONDITIONS C-2 EROSION CONTROL AND DEWATERING PLAN C-3 DEMOLITION PLAN C-4 GRADING AND DRAINAGE PLAN C-5 SITE PLAN SITE RESTORATION PLAN C-6 CD-1 - CD-6 CIVIL DETAILS

GENERAL NOTES AND LEGEND

INDEX G-1

JULY 2024 FOR PERMITTING

TOWN OF NORTH ANDOVER. MA









PETER BOYNTON - PLANING BOARD AND HARBORMASTER TED KELLEY - PROJECT PROPONENT JEAN ENRIGHT - DIRECTOR OF PLANNING JOHN BORGESI, PE - TOWN ENGINEER **AMY MAXNER - CONSERVATION ADMINISTRATOR**



GENERAL NOTES:

- BASE MAP INFORMATION IS FROM A FIELD SURVEY PERFORMED BY ZENITH LAND SURVEYORS, LLC. ON NOVEMBER 17 2022, HORIZONTAL DATUM IN U.S. SURVEY FEET IS REFERENCED TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD83), VERTICAL DATUM IN U.S. SURVEY FEET REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
- 2. PROPERTY LINE. STREET LINE AND OWNER INFORMATION WAS COMPILED FROM RECORDS ON FILE AT THE NORTHERN ESSEX COUNTY REGISTRY OF DEEDS OFFICE AND THE NORTH ANDOVER ASSESSING DEPARTMENT. ABUTTING PARCELS COMPILED FROM MASSGIS AND SHOULD BE CONSIDERED APPROXIMATE FOR THE PURPOSE OF THIS PLAN. SUBJECT SITE IS IN A RESIDENTIAL ZONE AS DEPICTED ON THE TOWN OF NORTH ANDOVER ZONING MAP.
- 3. ALL EXISTING UTILITIES SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL NOTIFY DIG SAFE AT LEAST 72 HOURS IN ADVANCE, EXCLUDING WEEKENDS AND HOLIDAYS, PRIOR TO ANY EXCAVATION.
- 4. DO NOT SCALE DRAWINGS UNLESS OTHERWISE NOTED. WRITTEN DIMENSIONS AND STATIONING SHALL PREVAIL. REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY.
- 5. THE CONTRACTOR SHALL RESTORE ALL PUBLIC AND PRIVATE PROPERTY TO ITS PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER UNLESS NOTED TO BE ALTERED.
- 6. ALL EXISTING STORM DRAIN, SEWER, AND WATER MAIN LINES ENCOUNTERED DURING CONSTRUCTION ARE TO REMAIN IN SERVICE UNLESS OTHERWISE NOTED. THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER SHALL REPAIR ANY EXISTING SEWERS, STORM DRAIN LINES, WATER LINES OR CULVERTS DAMAGED DURING CONSTRUCTION.
- 7. IN THOSE INSTANCES WHERE POWER OR TELEPHONE POLE SUPPORT IS REQUIRED, THE CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE UTILITY COMPANY TO OBTAIN REQUIRED SERVICE. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR TEMPORARY BRACING OF UTILITIES OR FOR ANY RELATED DELAYS.
- 8. ALL STRUCTURES AND PIPELINES LOCATED ADJACENT TO THE TRENCH EXCAVATION SHALL BE PROTECTED AND SUPPORTED BY THE CONTRACTOR UNTIL THE TRENCH IS BACKFILLED. DAMAGE TO ANY SUCH STRUCTURE CAUSED BY, OR RESULTING FROM. THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER, ALL UTILITIES REQUIRING REPAIR, RELOCATION, OR ADJUSTMENT AS A RESULT OF THE PROJECT SHALL BE COORDINATED BY THE CONTRACTOR, THROUGH THE RESPECTIVE UTILITY AND THE OWNER.
- 9. THE CONTRACTOR SHALL TAKE SPECIAL CARE NOT TO DAMAGE TREES, BUSHES, PLANTS, PARKING METERS, FLOWERS, STONEWALLS, FENCES, ETC. WITHIN THE CONSTRUCTION AREA UNLESS THEY ARE NOTED TO BE REMOVED. CONTRACTOR SHALL REPLACE ALL DAMAGED ITEMS AT NO ADDITIONAL COST TO OWNER.
- 10. THE CONTRACTOR SHALL REMOVE AND REPLACE NEW, OR REPAIR, ALL CURBS, SIDEWALKS, PAVEMENT AND OTHER ITEMS DAMAGED BY HIS CONSTRUCTION ACTIVITIES TO AT LEAST THEIR ORIGINAL CONDITION, AND TO THE SATISFACTION OF THE OWNER AND ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
- 11. THE CONTRACTOR SHALL BE REQUIRED TO FURNISH AND MAINTAIN A TELEPHONE NUMBER WHERE THE CONTRACTOR CAN BE REACHED 24 HOURS A DAY, 7 DAYS A WEEK.
- 12. THE LOCATION AND LIMITS OF ALL ON-SITE WORK AND STORAGE AREAS SHALL BE REVIEWED/COORDINATED WITH, AND ACCEPTABLE TO THE TOWN AND THE ENGINEER. THE CONTRACTOR SHALL LIMIT HIS ACTIVITIES TO THESE AREAS.
- 13. THE CONTRACTOR SHALL IDENTIFY AND OBTAIN ALL NECESSARY PERMITS FOR WORK IN ROADWAYS AND TRENCHES. THE CONTRACTOR IS RESPONSIBLE FOR CONFORMING TO ALL PERMITS AS AN INTEGRAL PART OF HIS WORK
- 14. THE CONTRACTOR SHALL SAW CUT ALL PAVEMENT TO ITS FULL DEPTH IN THE PROCESS OF INSTALLING NEW UTILITIES IN ALL PAVED AREAS INCLUDING STREETS, DRIVEWAYS, AND SIDEWALKS.
- 15. TEST PITS MAY BE ORDERED BY THE ENGINEER TO DETERMINE THE LOCATION OF EXISTING UTILITIES. THE CONTRACTOR MAY REQUEST TEST PITS TO VERIFY EXISTING UTILITIES AT NO ADDITIONAL COSTS TO THE
- 16. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
- 17. CONCRETE WASHOUT AREAS SHALL BE OUTSIDE THE BUFFER ZONES OF ALL WETLAND RESOURCE AREAS THE WASHOUT AREA MUST BE INSTALLED WITH AN IMPERMEABLE LINER OR A PREFABRICATED CONCRETE WASHOUT CONTAINER
- 18. THE LOCKING BOLLARDS SHOWN ON C-6 ARE REQUIRED TO LIMIT TRAILER ACCESS TO THE BOAT RAMP FOR EXCLUSIVE USE BY THE TOWN OF NORTH ANDOVER FIRE RESCUE. LAKE REGULATIONS PROMULGATED BY THE SELECT BOARD PROHIBIT ANY TRAILER LAUNCHING BOATS INTO THE LAKE BY THE GENERAL PUBLIC. THE NORTH ANDOVER FIRE DEPARTMENT SHALL BE RESPONSIBLE FOR KEEPING THE LOCKING BOLLARDS LOCKED.

SUGGESTED SEQUENCE OF WORK:

- NO CONSTRUCTION SHALL BEGIN UNTIL ANY AND ALL PERMITS ARE OBTAINED FROM THE TOWN OF NORTH ANDOVER
- STAKE LIMITS OF CLEARING. 2.
- 3. INSTALL EROSION CONTROL MEASURES, TURBIDITY CURTAIN, AND COFFERDAM. SCHEDULE INSPECTIONS WITH THE TOWN IN ACCORDANCE WITH THE OOC.
- PERFORM CLEARING AND GRUBBING AS NECESSARY. PERFORM PAVEMENT DEMOLITION AT DRIVEWAY 4. APRON
- INSTALL CONSTRUCTION ENTRANCE. 5.
- PERFORM DEMOLITION OF EXISTING STRUCTURES ON OR APPURTENANT TO THE SITE (INCLUDING THE EXISTING RETAINING WALL, BOAT LAUNCH RAMP, ETC.). DISPOSE OF DEBRIS IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
- PERFORM EARTHWORK CUT AND FILLS FOR ROUGH GRADE ALONG WATERFRONT. 7.
- CONSTRUCT RETAINING WALL, REVETMENT, AND BOAT LAUNCH RAMP. 8.
- REMOVE DEWATERING CONTROLS AND RE-ESTABLISH EROSION CONTROL MEASURES AROUND LIMITS OF 9. CURRENT WORK AREA.
- 10. PERFORM EARTHWORK CUT AND FILLS FOR ROUGH GRADE THROUGHOUT REMAINING WORK AREA.
- 11. INSTALL UTILITIES AND STORMWATER SYSTEM (INCLUDING DRAINAGE STRUCTURES AND PIPING), PERFORM FINE GRADING, CONSTRUCT RAIN GARDENS, AND PREPARE SUBGRADE FOR DRIVEWAY, PATHWAY, AND
- 12. PERMANENT/ FINAL STABILIZATION.
- 13. REMOVE CONSTRUCTION ENTRANCE AND PERIMETER EROSION CONTROLS.

AB	BRE	VIATIONS		
BI	г	BITUMINOUS		
BC	w	BOTTOM OF WALL		
CB		CATCH BASIN		
CI		CAST IRON	<u> </u>	7
СС	ONC	CONCRETE		G
D		DRAIN		OHW —
DL	A	DIAMETER		×
DN	ин	DRAIN MANHOLE		0
EC	P	EDGE OF PAVEMENT	w	~~~ w
EL		ELEVATION		
EX		EXISTING		_
FN	1	FORCEMAIN		
ID		INSIDE DIAMETER		
IN'	v	INVERT		0
LD		LANDSCAPE AREA	S-	s
LF		LINEAR FEET		3
M	AX	MAXIMUM		w
M	N	MINIMUM		- 60 -
M	SE	MECHANICALLY STABILIZED EARTH		55 —
M	w	MONITORING WELL		v
00	2	ON CENTER		8 WF
PR	OP	PROPOSED		2
RC	P	REINFORCED CONCRETE PIPE	50 -	5
R8	D	REMOVE AND DEMOLISH		7
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R8	kR	REMOVE AND RESET		
RE	т.	RETAINING		4
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SN	ин	SEWER MANHOLE		-
тс	ЭB	TOP OF BANK		1-
тс	w	TOP OF WALL		8 10
TY	Ρ.	TYPICAL		OHW —
w		WATER	FZ -	— F
w	F	WETLAND FLAG		

WG WATER GATE

UP UTILITY POLE

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LEGEND

PROPOSED

EXISTING

	PROPERTY LINE	• • • • • • •	SILT FENCE AND FILTER SOCK
<u> </u>	METAL GUARDRAIL		TURBIDITY CURTAIN
J.	UTILITY POLE	~~~~~	COFFERDAM
OHW	ELECTRICAL OVERHEAD WIRE		GUARDRAIL
M	WATER GATE VALVE		LIMIT OF WORK
ЭС.	HYDRANT	<u> </u>	CONTOUR
— w —	WATER MAIN	ROSEC02	RIPRAP
	CATCH BASIN	DD	DRAIN PIPE
Ø	DRAIN MANHOLE	D	DRAIN MANHOLE (DMH)
_ D D	DRAIN LINE		R&D SURFACE
S	SEWER MANHOLE		R&D RETAINING WALL
_ss	SEWER LINE		R&R GUARDRAIL, SWING GATE
0	DECIDUOUS TREE	imes ^{54.09}	SPOT GRADE
	CONIFEROUS TREE	x	FENCE
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— 55 — —	MINOR CONTOUR		OVERFLOW DRAIN STRUCTURE
WL WL	WETLAND		RETAINING WALL
6 WF#	WETLAND FLAG AND NUMBER		LOAM & SEED
- 25 25	25' NO DISTURB ZONE	₽,+,+,+,4	STONE FILLED PAVERS
- 50	50' NO BUILD ZONE		GRASS FILLED PAVERS
- 75 75	DISTRICT CONSERVATION ZONE		BIORETENTION AREA
100 100	100' WETLAND BUFFER 150' WATERSHED PROTECTION	$\langle \rangle$	REVETMENT
	DISTRICT NON-DISTURBANCE ZONE	505050505050505050	CONSTRUCTION ENTRANCE
BH EP #	BORING		HANDHOLE W/ COVER
A	BENCHMARK	—EE	UNDERGROUND ELECTRIC
· · <u> </u>	TOP OF BANK		PAVEMENT
6 TOB#	TOP OF BANK FLAG AND NUMBER		
OHW	ORDINARY HIGH WATER MARK		
- FZ —— FZ ——	100-YEAR FEMA FLOOD ZONE		

CHICHEWICK BOAT LAUNCH NORTH ANDOVER, MA

NOTES AND LEGEND

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PERMITTING

Sheet No.





Approved by



wing file: I:North Andover.312/23012245 - N. Lake Cochichewick Boat Launch/05 CAD/Permit Drawings/03 01-03 Civil Sheets dwg Plot Date: Aug 21,2024-10:49am





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34" DRAWING R.IP Checked b RJP MARK DATE DESCRIPTION Approved b

GENERAL PLANTING PLAN NOTES:

- THE PLANTING AREA SHALL BE EXCAVATED TO THE ELEVATIONS SHOWN ON THE GRADING PLAN ON SHEET C-4.
- 2. FOR ALL SLOPES GREATER THAN 3H:1V, ADD THE EROSION CONTROL BLANKET.
- THE CONTRACTOR WILL WORK WITH REPRESENTATIVES OF THE CONSERVATION COMMISSION TO IDENTIFY THE LOCATION/DISTRIBUTION OF PLANTINGS WITHIN THE PLANTING AREAS. THE CONTRACTOR WILL INITIALLY STAKE OUT PROPOSED LOCATIONS FOR REVIEW AND APPROVAL BY THE CONSERVATION COMMISSION OR ITS AGENT
- THE CONTRACTOR SHALL ATTEMPT TO PROTECT ALL TREES 6-INCHES IN DIAMETER OR LARGER. TREE SPECIES SHALL BE SELECTED FROM 4. THE NORTH ANDOVER APPROVED PLANT MATERIALS LIST AND SUBMITTED TO THE CONSERVATION COMMISSION FOR APPROVAL PRIOR TO PURCHASING AND INSTALLING PLANTINGS. ALL TREES REMOVED THAT ARE 6-INCHES IN DIAMETER OR LARGER SHALL BE REPLACED AS FOLLOWS:
 - 4.1 SIZE: 2+ GALLON(S) OR 4'-5' OR LARGER
 - 4.2 SPACING 10'-15' ON CENTER
 - 4.3 TOTAL NUMBER: TO BE DETERMINED DURING CONSTRUCTION
 - 4.4 TYPE: TREES SHALL BE GROWN NATIVE FROM THE FOLLOWING LIST:
 - A. RED MAPLE ACER RUBRUM
 - B. AMERICAN HORNBEAM CARPINUS CAROLINIANA C. AMERICAN MOUNTAIN ASH SORBUS AMERICANA

 - D. PAPER BIRCH BETULA PAPYRIFERA
- 5. PLANTINGS SHALL CONSIST OF SHRUBS, AND SEED MIX. FOR SEEDING SEE DETAIL ON THIS SHEET. SHRUB SPECIES SHALL BE SELECTED FROM THE NORTH ANDOVER APPROVED PLANT MATERIALS LIST AND SUBMITTED TO THE CONSERVATION COMMISSION FOR APPROVAL PRIOR TO PURCHASING AND INSTALLING PLANTINGS. SHRUBS SHALL BE INSTALLED AS FOLLOWS:
 - 5.1 SIZE: 3'-4'
 - 5.2 SPACING 8'-10' ON CENTER

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- 5.3 TOTAL NUMBER: 25
- 5.4 SHRUBS SHALL BE GROWN NATIVE FROM THE FOLLOWING LIST:
 - A. SUMMER SWEET CLETHRA ALNIFOLIA
 - B. COMMON WINTERBERRY LLEX VERTICILLATA
 - C. RASPBERRY RUBUS IDAEUS
 - D. FLDERBERRY SAMBUCUS CANADENSIS
 - E. MEADOWSWEET SPIRAEA ALBA VAR. LATIFOLIA
- 6. ALL PLANTINGS SHALL BE REMOVED FROM BURLAP SACKS, WIRE CAGES AND PLASTIC CONTAINERS PRIOR TO PLANTING.
- 7. EACH PLANT SHALL HAVE ITS ROOTS LOOSENED PRIOR TO PLANTING TO ENCOURAGE ROOT GROWTH AWAY FROM THE ROOT BALL.

ARIES- SEE PLANS

PLANTING HOLES SHALL BE DUG A MINIMUM OF 2X DIAMETER OF THE ROOT BALL TO REDUCE SOIL COMPACTION AND ALLOW FOR HEALTHY ROOT ESTABLISHMENT

- SET CROWN OF ROOTBALL 1" ABOVE FINISHED SOIL GRADE

2" DEPTH COMPOSTED BARK MULCH,

REMOVE ROPES, WIRES, & NON-BIODEGRADABLE MATERIALS FROM ROOTBALL, LOOSEN ROOT BOUND ROOTBALLS OF CONTAINER

KEEP FREE OF TRUNK/STEMS

PLANTING SOIL

GROWN SHRUBS

COMPACTED SUBGRADE

NATIVE PLANTS MONITORING PLAN NOTES:

- MONITORING AND REPORTING ASSOCIATED WITH THE COMPLETED NATIVE PLANTING AREA SHOULD FOLLOW AND BE IN COMPLIANCE 1. WITH THE ORDER OF CONDITIONS ISSUED BY THE CONSERVATION COMMISSION AND ANY OTHER RELEVANT PERMIT THAT APPLIES.
- 2. ANNUAL REPORTING AND ANY DELIVERABLES WILL BE SUBMITTED TO THE APPLICABLE PERMITTING AUTHORITIES.
- POST PLANTING. THE AREA WILL BE MONITORED AS REQUIRED BY THE ORDER OF CONDITIONS FOR A PERIOD OF TWO YEARS. TO 3. CONDUCT VISUAL ASSESSMENT TO DETERMINE IF FURTHER ACTION IS NECESSARY TO REMOVE AND REPLACE DEAD PLANTS, REMOVE ACCUMULATED DEBRIS, AND TO REMOVE ANY UNWANTED AND COMPETING INVASIVE PLANTS.
- SHOULD THE AREA EXPERIENCE AN UNUSUAL FLOOD EVENT, AN ADDED SITE VISIT WILL BE CONDUCTED TO ASSESS ANY DAMAGE AND 4. TO TAKE RADIATION ACTION
- THE INTENT IS TO HAVE THE PLANTED AREAS ACHIEVE 75% GROWTH IN COVER AND MATURITY AT THE END OF THE TWO-YEAR MONITORING PERIOD.
- EVERY OPPORTUNITY WILL BE TAKEN TO REMOVE INVASIVE PLANTS SO THEY ARE WEAKENED ALLOWING THE INDIGENOUS PLANTINGS 6. TO TAKE OVER AND THRIVE
- IF THE PLANTS GET DISTRESSED DURING THE MONITORING PERIOD, AN EXAMINATION OF THE SOIL SHALL DETERMINE IF THE SOIL PH BALANCE NEEDS ADJUSTMENT OR PLANT FERTILIZATION IS NEEDED.



ROW SPACING ('B')
5 IN. O.C.
7 IN. O.C.
8-1/2 IN. O.C.
10-1/2 IN. O.C.
13 IN. O.C.
16 IN. O.C.
21 IN. O.C.
26 IN. O.C.

PERENNIAL PLANTING LAYOUT SCALE: N.T.S

ENTAL	RYAN J.
TNERS	PAUL CIVIL No. 51127 REGISTERED
npany —	Salonal Egg

SHRUB AND PERENNIAL PLANTING, TYP

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			Date	JULY 2024			
			Job No.	22003302		TOWN OF	
54			Designed by	JLV	THIS LINE IS ONE INCH LONG WHEN PLOTTED AT FULL SCALE ON A 22" X		
			Drawn by	AES			
			Checked by	RJP	34" DRAWING		
MARK	DATE	DESCRIPTION	Approved by	RJP			











IDENTIFI-	SIZE OF SIGN (INCHES)		TEXT	TEXT DIMENSIONS (INCHES)		NUMBER OF	SER COLOR		POST SIZE AND	UNIT AREA IN	AREA IN
NUMBER	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	SIGNS REQUIRED	BACK- GROUND LEG	END BORDER	NUMBER REQUIRED	SQUARE FEET	FEET
R6-1L	36	12		MU ⁻ STAN	rcd Dard	1	MU ⁻ STAN	TCD DARD	P5 (1)	3.00	3.00
R6-1R	36	12	ONE WAY			1			P5 (1)	3.00	6.00
R6-1(PBS)	36	12				2			P5 (2)	3.00	6.00
R7-8 (MOD)	12	18	RESERVED PARKING C.			1			P5 (1)	1.50	1.50
R7-7 (MOD)	12	18	TRAILER PARKING ONLY			2			P5 (2)	1.50	3.00
R5-3 (MOD)	24	24	NO TRAILER ACCESS			1		l l l l l l l l l l l l l l l l l l l	P5 (1)	4.00	4.00





TYPICAL SIGNPOST SCALE: N.T.S.

NOTES:
 SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES 2009 EDITION WITH LATEST REVISIONS AND MASSACHUSETTS AMENDMENTS FOR LATEST SPECIFICATIONS ON TEXT DIMENSIONS AND COLOR.
 HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. THE 2009 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", THE 1990 MDPW "STANDARD DRAWINGS FOR SIGNS AND SUPPORTS", AND ALL AMENDMENTS WILL GOVERN.
 PRIOR TO ORDERING SIGNAGE, THE CONTRACTOR SHALL FIELD VERIFY SIGNAGE TO BE REPLACED WITH THE TOWN AND SUBMIT SHOP DRAWINGS OF ALL PROPOSED SIGNAGE FOR REVIEW AND APPROVAL BY THE TOWN.





RYAN J. PAUL CIVIL No. 51127

0112212024	MARK	DATE	DESCRIPTINDW	Approved by	RJP		
				Checked by	RJP	34" DRAWING	CIVIL DETAILS
				Drawn by	AES	FULL SCALE ON A 22" X	
	06			Designed by	JLV	THIS LINE IS ONE INCH	
				Job No.	22003302		TOWN OF NORTH ANDOVER, MA
				Date	JULY 2024		
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PERMITTING



US Army Corps

of Engineers ® New England District WORK-START NOTIFICATION FORM

(Minimum Notice: Two weeks before work begins)

EMAIL TO: Maninder.Singh@usace.army.mil and cenae-r@usace.army.mil; or

MAIL TO: Maninder Singh Regulatory Division U.S. Army Corps of Engineers, New England District 696 Virginia Road Concord, Massachusetts 01742-2751

Corps of Engineers Permit No. **NAE-2024-02012** was issued to **John J. Borgesi**. This work is located in Lake Cochichewick, Great Pond Road, North Andover, Massachusetts 01845 at approximate site coordinates 42.714537, -71.112686 and authorized to permanently impact 812 square feet and temporarily impact 5,662 square feet of area below the Ordinary High Water (OHW) mark to repair and modify an existing boat launch. 42.2 cubic yards of material will be dredged from 562 square feet of the area along the lake bank. The dredged area will be backfilled by 45.5 cubic yards of fill to facilitate the boat launch. 20.8 cubic yards of existing slope stabilization material will be dredged from 250 square feet of area which will be backfilled by 21.3 cubic yards of native rock. Approximately 5,662 square feet of area will be in the dry for a duration of 1.5 months. Turbidity curtains will be installed for the duration of all in-water work.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm:	
Business Address:	
Phone & email: ()	()
Proposed Work Dates: Start:	Finish:
Permittee/Agent Signature:	Date:
Printed Name:	Title:
Date Permit Issued: _March 19, 2025	Date Permit Expires: June 1, 2028
**************************************	**************************************
PM: <u>Maninder Singh</u>	Submittals Required: Yes
Inspection Recommendation:	

U.S. Army Corps of Engineers (USACE)

CERTIFICATION OF COMPLIANCE WITH DEPARTMENT OF THE ARMY PERMIT

For use of this form, see Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbors Act of 1899, and Section 103 of the Marine Protection, Research, and Sanctuaries Act; the proponent agency is CECW-COR.

Form Approved -OMB No. 0710-0003

Expires 2027-10-31

The Agency Disclosure Notice (ADN)

The Public reporting burden for this collection of information, 0710-0003, is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at <u>whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil</u>. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

PURPOSE: This form is used by recipients of U.S. Army Corps of Engineer Regulatory permits to certify compliance with the permit terms and conditions.

Your permitted activity is subject to a compliance inspection by a U.S. Army Corps of Engineers representative. If you fail to comply with this permit, you are subject to permit suspension, modification, or revocation.

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the U.S. Army Corps of Engineers, <u>New England District</u>.

The certification can be submitted by email at <u>dll-cenae-r-ma@usace.army.mil</u> or by mail at the below address:

Upon completion of the activity authorized by this permit and any mitigation required by the permit, sign this certification and return it to the U.S. Army Corps of Engineers,

U.S. Army Corps of Engineers New England District Regulatory Division 696 Virginia Road Concord, MA 01742-2751

	СОМ	PLETED BY THE CO	ORPS		
Corps Action Number:	NAE-2024	4-02012			
Permit Type:	Regional General Permit				
General Permit Number and Name (<i>if applicable</i>):	GP 5 and GP 9				
Name of Permittee:	John J. B	orgesi			
Project Name:	Lake Coc	hichewick Boat Laun	ch Repair/Modification		
Project Location (physical address):	Project Location (<i>physical address</i>): Within Lake Cochichewick, on Great Pond Road, North				
	Andover,	Massachusetts 0184	5 at approximate site coordinates		
42.714537, -71.112686.					
	PERM	IITTEE'S CERTIFIC/	ATION		
Date Work Started:					
Date Work Completed:					
Enclose photographs showing the completed project (if	available).				
I hereby certify that	the work a	uthorized by the abo	ve referenced permit has been		
completed in accordance with all of the permit terms an with the permit conditions.	d conditior	ns, and that any requ	ired compensatory mitigation has	been completed in accordance	
Name		Date	Signature		
ENG FORM 6285. DEC 2024	PREVIOU	IS EDITIONS ARE O	BSOLETE.		



Commonwealth of Massachusetts Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

100 Cambridge Street Suite 900 Boston, MA 02114 • 617-292-5500

Maura T. Healey Governor

Kimberley Driscoll Lieutenant Governor Rebecca L. Tepper Secretary

> Bonnie Heiple Commissioner

February 19, 2025

John Borgesi North Andover Department of Public Works 384 Osgood Street North Andover, MA 018451

RE: 401 WATER QUALITY CERTIFICATIONS - BRP 24-WW26-0054-APP

North Lake Cochichewick Boat Launch Complete Application Date: January 21, 2025

DEP File # 242-1900 EEA # 16850 ACOE Project # NAE-2024-02012

AT: North Andover, MA – North Lake Cochichewick Boat Launch Project Drainage Area – Merrimack River Basin

Dear Mr. Borgesi,

The Massachusetts Department of Environmental Protection (Department of MassDEP) has reviewed your application for the Water Quality Certification (401 WQC or Certification), as referenced above. In accordance with the provisions of Section 401 of the Federal Clean Water Act as amended (33 U.S.C. §1251 et seq.), M.G.L. c. 21, §§ 26-53, and 314 CMR 9.00. MassDEP has been determined there is reasonable assurance the project or activity, as conditioned herein, will be conducted in a manner which will not violate applicable Surface Water Quality Standards at 314 CMR 4.00 *Massachusetts Surface Water Quality Standards* as implemented and supplemented, without limitation at 314 CMR 9.00.

Lake Cochichewick in North Andover, Massachusetts is designated for protection as a Class A Water which is an inland Water so designated pursuant to 314 CMR 4.06¹ and includes, without limitation, 314 CMR 4.06(1)(d)1. and (4) as public water supplies and their tributaries;

^{1 314} CMR 4.06 Table 15 – Merrimack River Basin.

401 Water Quality Certificate - BRP 24-WW26-0054 APP Lake Cochichewick Boat Launch - North Andover, Massachusetts

certain wetlands designated in 314 CMR 4.06(2); certain reservoirs designated in 314 CMR 4.06(3); and certain surface waters designated in 314 CMR 4.06(6)(b). They are designated as excellent habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation, even if not allowed. These waters shall have excellent aesthetic value. These waters are protected as Outstanding Resource Waters.

Project Description:

The proposed project involves the reconstruction of a hand-carry boat launch (Project). Dredging is required to demolish the existing boat launch, retaining wall, and to install the slope stabilization along the Lake's edge. The site involves the replacement of a failed shoreline concrete and stone retaining wall and the reconstruction of the parking, driveway, and boat rack areas. The launch will be constructed using a mechanically stabilized earth concrete block retaining wall. The project area will also include permeable paver parking areas and driveways as well as bioretention areas to effectively manage stormwater runoff. Other site appurtenances include a new double swing gate and locking bollards at the boat ramp to restrict access and ensure security.² North Lake Cochichewick is registered as a Great Pond in Massachusetts. The lake is also considered an Outstanding Resource Water as a public drinking water supply and serves as the sole drinking water source in the Town of North Andover.³

<u>Resource Impacts</u>: Resource impacts will result in approximately 4,838 square feet (4,026square feet of temporary and 812 square feet permanent) of impact to Land Under Water (LUW). The Project will involve the removal of approximately 63 cubic yards of sediment to install the boat launch.⁴ Areas of disturbance have been minimized to the extent practicable. In order to minimize erosion, the project includes the installation of turbidity curtains to establish the work zone, shoreline grading, and removing the existing retaining wall and stone rock along the base of the wall. Dredge material management will be conducted in accordance with 314 CMR 9.07 and pursuant to Section 401 of the Federal Clean Water Act as implemented through the WQC process as defined by state regulation at 314 CMR 9.00.⁵

<u>Rare Species Habitat and Fisheries</u>: The project will occur within the actual habitat of the "Ligumia nasuta," also known as the "Eastern Pond Mussel." As such, the Project is conditioned in a manner as to avoid a "prohibited take". Prior to any in-water work, a search will be conducted by an approved biologist for state-listed mussels. The project will be subject to a Time of Year (TOY) restriction to allow for a mussel survey and relocation to occur no earlier

² See Plans: North Lake Cochichewick Boat Launch – Town of North Andover, MA. By Environmental Partners, dated July 2024. 14 Sheets.

³ Although the project is proposed in an ORW, the project may be permitted as maintenance, repair, replacement or reconstruction of a structure or facility for water-dependent use per 314 CMR 9.06(3)(k).

⁴ North Lake Cochichewick Boat Launch – Town of North Andover, MA July 2024 For Permitting by Environmental Partners. 14 Sheets. Signed and dated: Ryan J. Paul, PE July 22, 2024.

⁵ The repairs to the boat ramp are also subject to Corps of Engineers jurisdiction pursuant to Section 404 of the Clean Water Act. Work was authorized by the Corps of Engineers under Massachusetts General Permit #1 as a replacement of a currently serviceable structure authorized by 33 CFR 3330.3 (b).

than June 1 and prior to October 1 of any year. Mussels found during the search will be moved out of areas that will be altered by the project.⁶

<u>Alternatives</u>: Two separate alternatives analyses were conducted for those portions of the project below mean high water: one analysis reviewed retaining wall designs associated with the boat launch ramp. Of the three retaining wall alternatives (i.e., concrete block wall, vegetated retaining wall, and no-alteration), use of the concrete block wall was preferable. This Alternative was deemed the best design to reduce maintenance and potential future wall failures due to the known wave-action that has caused severe bank erosion on this site.

A second alternative analysis reviewed boat launch designs. Boat launch alternatives included: a permeable paver boat launch with revetment, a concrete boat launch with concrete retaining wall, and no-alteration. The preferred alternative of permeable pavers with revetment provides concrete paver with a porous gravel fill, a drainage layer, and associated large boulder revetment to stabilize the side slopes. This alternative was preferable to the use of impervious concrete or no-alteration which would not achieve the project purpose.

<u>Mitigation</u>: Temporary cofferdams will be installed to allow construction activities to occur "in the dry." The cofferdam structures will be installed within the Lake to allow for construction of the boat launch and retaining wall. A dewatering pump will be used to keep the work area dry. The discharged water shall pass through filter fabric, silt bags, frac tanks or a combination of all, settling out any solids prior to discharging back into the lake. A turbidity curtain shall also enclose any construction activity within the lake and contain any sediment disturbance from dredging operations. Material stockpiles will be maintained in upland locations and placed on a plastic liner with hay bales or filter sock surrounding the stockpile. Water quality impacts will also be mitigated by two stormwater bioretention areas (rain gardens) to increase groundwater recharge and reduce scour to Lake Cochichewick. All disturbed areas will be stabilized and restored to original conditions with loam and seed after construction.

<u>Sediment Testing</u>: The two sediment core samples collected and analyses for the site contained less than 10% by weight of particles passing the No. 200 U.S. Standard Series Testing Sieve. Based on these results, and as supplemented by the "due diligence" review which does not demonstrate the presence of any sediment contamination within the project area or the likelihood anthropogenic concentrations of oil or hazardous materials, no further chemical testing was required to be conducted of the sediment samples.

<u>Dredge Material Disposal or Reuse</u>: Dredge material is anticipated to be removed mechanically with heavy equipment. Following sediment removal and dewatering the dredged material will be transported from the site and disposed of at a DEP-approved off-site facility.⁷ All sediment will be required to be dewatered to a moisture content comprising no free liquids.

⁶ See: Correspondence and list of conditions from Natural Heritage of Endangered Species Program (NHESP File No. 24-17147) on March 15, 2024.

⁷ See: Dredging and Disposal Operations Plan by Environmental Partners submitted with the 401 WQC application on October 7, 2024.

<u>Section 61 Findings:</u> Based on a review of a Single Environmental Impact Report (Single EIR), comment letters, and in consultation with Agencies, a finding was made that the Single EIR adequately and properly complies with MEPA regulations and no further MEPA review was required.⁸

<u>Public Notice</u>: A public notice of this application was published in the Lawrence Eagle Tribune and the Environmental Monitor on October 7, and November 8, 2024, respectively. No comments were received by MassDEP during the 21-day public comment period pursuant to 314 CMR 9.05(3)(e).

Therefore, based on information currently in the record, MassDEP grants a 401 WQC for this project subject to the following conditions to maintain or attain water quality, to minimize any damage to the environment that may result from the project, and to ensure compliance with appropriate provisions of state law. MassDEP certifies that there is reasonable assurance the project or activity, as conditioned herein, will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other appropriate requirements of state law.

Pursuant to 314 CMR 4.00, 314 CMR 9.09(1), 314 CMR 9.01(2), 314 CMR 9.01(3), 314 CMR 9.04(5), 314 CMR 9.05(1), 314 CMR 9.05(4), 314 CMR 9.06, 314 CMR 9.07(1), 314 CMR 9.07(2), 314 CMR 9.07(3), 314 CMR 9.09(1), 314 CMR 9.09(2), 314 CMR 9.07(1), and 314 CMR 9.07(5), the following Special Conditions are necessary to ensure that sediment dredging and disposal practices are implemented in such a manner as to prevent water quality degradation to Waters of the United States within the Commonwealth. The conditions ensure that practicable steps are taken to avoid and minimize impacts to water quality from turbidity and sedimentation associated with sediment dredging, disposal, and/or transportation.

- 1. The Contractor shall take all steps necessary to assure that the proposed activities will be conducted in a manner that will avoid violations of the anti-degradation provisions of the Massachusetts Surface Water Quality Standards, that protect all waters, including wetlands.
- 2. MassDEP shall be notified of any change(s), modifications, or deletions of work as specified in the proposed Project plans that may affect water quality prior to the start of work or any portion of the work. Depending on the nature and the scope of any change, MassDEP will determine whether the change(s) require further approvals or revision to this Certification.
- 3. Prior to the start of work, a Sediment Management Plan shall be provided to MassDEP for review and approval regarding dredge material dewatering and disposal and the name and location of a certified upland disposal facility. If the licensed facility is located out of state, documentation shall be provided to MassDEP to document that the dredged material disposal/reuse has been approved and will be accepted by the receiving State.

⁸ See: Certificate of the Secretary of Energy and Environmental Affairs on the Single Environmental Impact Report dated December 16, 2024

401 Water Quality Certificate - BRP 24-WW26-0054 APP Lake Cochichewick Boat Launch - North Andover, Massachusetts

- 4. Best Management Practices (BMPs) shall be implemented during transportation of the dredged material to the licensed receiving facility. At a minimum, when transported upon public roadways, all dredged material shall have no free liquid as determined by the Paint Filter Test or other suitably analogous methodology acceptable to the MassDEP, and a tarpaulin or other means shall be used to cover the dredged material during transport.
- A Dredged Material Tracking Form (DMTF) or Material Shipping Record (MSR) shall be used if dredged material is transported to a licensed upland facility. A fully executed copy of the DMTF or MSR shall be provided to MassDEP within 30 days of final shipment to the reused location or facility.
- 6. The Applicant shall utilize construction related BMPs in accordance with the MassDEP's Stormwater Policy to minimize stormwater runoff and erosion from impacting wetland resources.
- 7. Dredging in accordance with this Certification may begin following the 21-day appeal period and once all other permits have been received.
- 8. All work shall be performed in substantial accordance with the following documents and plans submitted with the application:
 - Application for Water Quality Certificate, No. Andover Lake Cochichewick Boat Launch Replacement, Transmittal No. 24-WW26-0054-APP, dated October 7, 2024, with attachments.
 - Plans entitled: North Lake Cochichewick Boat Launch Town of North Andover, MA July 2024 for Permitting by Environmental Partners. 14 Sheets. Signed and stamped by Ryan J. Paul, PE July 22, 2024.
- 9. MassDEP shall be notified one week prior to the start of in-water work so that MassDEP staff may inspect the work for compliance with the terms and conditions of this 401 WQC.
- 10. The applicant and its contractor shall allow agents of MassDEP to enter the project sites to verify compliance with the conditions of this Certification.
- 11. The term of this Certification remains in effect for the same duration as the federal permit that requires it.
- 12. Future maintenance dredging and excavation is not authorized under this Certification.
- 13. Immediately prior to the commencement of in-water work, a survey of mussels in the project area shall occur between June 1 and October 1. Mussels identified shall be relocated and placed in suitable habitat outside the area of project impacts.
- 14. No later than one week prior to the start of in-water work, the applicant shall submit a notification procedure outlining the reporting process to MassDEP for incidents relating to dredging activities that impact surrounding resource areas and habitats. Incidents that trigger reporting include, but

401 Water Quality Certificate - BRP 24-WW26-0054 APP Lake Cochichewick Boat Launch - North Andover, Massachusetts

are not limited to, observed dead or distressed fish or other aquatic organisms, observed oily sheen on the surface of the water, a sediment spill, or a turbidity plume beyond the deployed BMPs. If at any time during implementation of the project such an incident occurs, the applicant shall immediately notify MassDEP and all site related activities impacting the water shall cease until the source of the problem is identified and adequate mitigating measures are deployed to the satisfaction of MassDEP.

- 15. The applicant, or its contractor, shall make every feasible effort to complete the project within the 401 WQC timeframe. Should the applicant, or their contractor, wish to request an amendment to the 401 WQC relative to the mussel survey window of June1 October 1, a written request explaining the need for the amendment shall be made to the Department. The Department will make a decision to grant or deny the amendment following a consultation with other resource agencies.
- 16. Best Management Practices (BMPs) shall be deployed to minimize turbidity during dredging and dewatering. Erosion and sedimentation control devices shall be inspected daily during construction Demolition of the boat ramp shall be done behind the cofferdam and silt curtains. The turbidity curtain outside the coffer dam shall serve as the limit of work and shall be monitored daily to ensure that the curtain remains in proper working condition.
- 17. During dredging operations, measures should be taken to avoid the potential spread of aquatic invasive species to other waterbodies. The dredged material shall be loaded directly into the sediment stockpile area and appropriate invasive species decontamination protocols should be reviewed and applied, as required. All vehicles, equipment and tools that have direct contact with invasive species should be cleaned before leaving the project areas. Under no circumstances shall sediment with invasive species seeds or rhizomes be reused or transported.
- 18. During work, daily monitoring shall be conducted for the presence of suspended sediment, debris or sheens. If visual sheens are observed, oil booms and absorbent oil pads shall be deployed to control off-site migration. Turbidity monitoring data should be kept on site and available for MassDEP review upon request.
- 19. During the project period, there shall be no discharge or spillage of fuel, oil or other pollutants, including sediments, onto any part of the site. The applicant shall take all reasonable precautions to prevent the release of pollutants by ignorance, accident or vandalism.
- 20. If oil and/or hazardous materials are identified during the implementation of this project, notification pursuant to the Massachusetts Contingency Plan (310 CMR 40.00) must be made to the Department. A Licensed Site Professional (LSP) shall be retained to determine if notification is required and if necessary, to render appropriate opinions. The LSP shall evaluate whether risk reduction measures are necessary if contamination is present.
- 21. When not in use, all equipment/machinery storage, servicing or cleaning, including but not limited to fueling, changing, adding or applying lubricants or hydraulic fluids, or washing/rinsing of trucks or equipment, shall be performed above the MHW line and outside any wetland resource areas.

- 22. Off-site sediment transportation of sediment shall not commence without prior notice to the Department including the name and location of the approved licensed receiving facility for disposal or reuse as daily cover material. Prior to off-site transportation and disposal, all sediment shall be dewatered to a moisture content comprising no free liquids as determined by paint filter testing in accordance with Solid Waste Regulations 310 CMR 19.000 and MassDOT requirements. Sediment tracking shall be documented with either a Material Shipping Record or Bill of Lading with copies provided to the Department.
- 23. Upon completion of the project, remnants of project debris such as coffer dams, dewatering structures, silt booms, and turbidity curtains shall be removed and disposed of appropriately at an offsite facility.
- 24. Within 30 days of the completion of dredging, a Summary Report shall be prepared and submitted to the Department and a copy shall be sent to CZM, attention: Sean Duffy. The summary report shall include, but not be limited to, final dredge volumes (not to exceed 63 cy), photographs of the affected areas depicting post-dredge conditions, and the coordinates in the Massachusetts State Plane (e.g. longitude and latitude) that clearly delineates the dredge footprint.
- 25. All communication to MassDEP required by this Certificate shall be directed to the attention of Michael Stroman <u>Michael.stroman@mass.gov</u>

Failure to comply with this 401 WQC is grounds for enforcement, including civil and criminal penalties, under M.G.L. c. 21, § 42, 314 CMR 9.00, M.G.L. c. 21A, § 16, 310 CMR 5.00, or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

This 401 WQC does not relieve the applicant of the obligation to comply with other appropriate state or federal statutes or regulations. Any changes made to the project as described in the previously submitted Permit Application or supplemental documents will require further notification to and, if an amendment is required, approval by the Department.

NOTICE OF APPEAL RIGHTS

Certain persons shall have a right to request an adjudicatory hearing concerning 401 WQCs by MassDEP when an application is required:

- a. the applicant or property owner;
- b. any person aggrieved by the decision who has submitted written comments during the public comment period;
- c. any ten persons of the Commonwealth pursuant to M.G.L. c. 30A where a group member has submitted written comments during the public comment period; or
- d. any governmental body or private organization with a mandate to protect the environment, which has submitted written comments during the public comment period.

Any person aggrieved, any ten persons of the Commonwealth, or a governmental body or private organization with a mandate to protect the environment may appeal without having submitted written comments during the public comment period only when the claim is based on

401 Water Quality Certificate - BRP 24-WW26-0054 APP Lake Cochichewick Boat Launch - North Andover, Massachusetts

new substantive issues arising from material changes to the scope or impact of the activity and not apparent at the time of public notice. To request an adjudicatory hearing pursuant to M.G.L. c. 30A, § 10, a Notice of Claim must be made in writing, provided that the request is made by certified mail or hand delivery to MassDEP, with the appropriate filing fee specified within 310 CMR 4.10 along with a DEP Fee Transmittal Form within 21 days from the date of issuance of this Certificate.

Docket Clerk Office of Administrative Appeals Department of Environmental Protection 100 Cambridge Street, Suite 900 Boston, MA 02108.

A copy of the request shall at the same time be sent by certified mail or hand delivery to the issuing office of the Wetlands Program at:

Department of Environmental Protection 100 Cambridge Street, Suite 900 Boston, MA 02108.

A Notice of Claim for Adjudicatory Hearing shall comply with MassDEP's Rules for Adjudicatory Proceedings, 310 CMR 1.01(6), and shall contain the following information pursuant to 314 CMR 9.10(3):

- a. the Combined Permit Transmittal Number;
- b. the complete name of the applicant and address of the project;
- c. the complete name, address, and fax and telephone numbers of the party filing the request, and, if represented by counsel or other representative, the name, fax and telephone numbers, and address of the attorney;
- d. if claiming to be a party aggrieved, the specific facts that demonstrate that the party satisfies the definition of "aggrieved person" found at 314 CMR 9.02;
- e. a clear and concise statement that an adjudicatory hearing is being requested;
- f. a clear and concise statement of (1) the facts which are grounds for the proceedings,
 (2) the objections to this Certificate, including specifically the manner in which it is alleged to be inconsistent with the MassDEP's Water Quality Regulations, 314 CMR 9.00, and (3) the relief sought through the adjudicatory hearing, including specifically the changes desired in the final written 401 WQC; and
- g. a statement that a copy of the request has been sent by certified mail or hand delivery to the applicant, the owner (if different from the applicant), the conservation commission of the city or town where the activity will occur, the Department of Conservation and Recreation (when the certificate concerns projects in Areas of Critical Environmental Concern), the public or private water supplier where the project is located (when the certificate concerns projects in Outstanding Resource Waters), and any other entity with responsibility for the resource where the project is located.

The hearing request along with a DEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100)

must be mailed to:

Commonwealth of Massachusetts Department of Environmental Protection Commonwealth Master Lockbox PO Box 4062 Boston, MA 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority. MassDEP may waive the adjudicatory hearing filing fee pursuant to 310 CMR 4.06(2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

Should you have any questions relative to this Combined 401 WQC, please contact Michael Stroman <u>Michael.stroman@mass.gov</u>.

Sincerely,

Lisa Rhodes Wetlands Program Chief

ecc: Maninder Singh, USACE <u>Maninder.Singh@usace.army.mil</u> Jamie Veillette, Apex Companies jlv@envpartners.com Ivan Morales, MassDEP Waterways, <u>ivan.morales@mass.gov</u> Melany Cheeseman, DFW <u>Melany.cheeseman@mass.gov</u> David Wong, David.W.Wong@mass.gov Jill Provencal, MassDEP Northeast Regional Office <u>Jill.Provencal@mass.gov</u> Sean Duffy, CZM <u>sean.duffy@mass.gov</u> Amy Maxner, No Andover Conservation Commission

Attachments: Communication for Non-English Speaking Parties document Project Plans:



Communication for Non-English-Speaking Parties

This document is important and should be translated immediately.

If you need this document translated, please contact MassDEP's Director of EJ at the telephone number listed below.

Español Spanish

Este documento es importante y debe ser traducido de inmediato. Si necesita este documento traducido, comuníquese con la Directora de Diversidad de MassDEP al número de teléfono que aparece más abajo.

Português Portuguese

Este é um documento importante e deve ser traduzido imediatamente. Se precisar de uma tradução deste documento, entre em contato com o Diretor de Diversidade da MassDEP nos números de telefone listados abaixo.

繁體中文 Chinese Traditional

本文件非常重要,應立即翻譯。如果您需要翻譯這份 文件,請用下面列出的電話號碼聯絡 MassDEP 多元

化負責人。 简体中文 Chinese Simplified

本文件非常重要,应立即翻译。如果您需要翻译这份 文件,请用下面列出的电话号码与 MassDEP 的多元 化主任联系。

Ayisyen Kreyòl Haitian Creole

Dokiman sa-a se yon bagay enpòtan epi yo ta dwe tradwi I imedyatman. Si ou bezwen dokimar sa a tradwi, tanpri kontakte Direktè Divèsite MassDEP Ia nan nimewo telefòn endike anba.

Việt Vietnamese

Tài liệu này rất quan trọng và cần được dịch ngay lập tức. Nếu quý vị cần dịch tài liệu này, xin liên lạc với Giám đốc Đa dạng của MassDEP theo các số điện thoại ghi đưới đây.

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះគឺសំខាន់ហើយគួរត្រូវបានបកប្រែ ភ្លាម១។ ប្រសិនបើអ្នកត្រូវការឲ្យគេបកប្រែ ឯកសារនេះ

សូមទាក់ទងមកនាយកផ្នែកពិពិធកម្មរបស់ MassDEP តាមលេខទូរស័ព្ទខាងក្រោម។

Kriolu Kabuverdianu Cape Verdean

Kel dukumentu li é inpurtánti y debe ser traduzidu imidiatamenti. Se bu meste di kel dukumentu traduzidu, pur favor kontakta Diretor di Diversidádi di MassDEP na numeru abaxu indikadu.



Contact Deneen Simpson 857-406-0738 Massachusetts Department of Environmental Protection 100 Cambridge Street 9th Floor Boston, MA 02114 TTY# MassRelay Service 1-800-439-2370 • <u>https://www.mass.dov/environmental-ustoe</u> (Version revised 4.21.2023) 310 CMR 1.03(5)(a)

401 Water Quality Certificate - BRP 24-WW26-0054 APP Lake Cochichewick Boat Launch - North Andover, Massachusetts

Русский Russian

Это важный документ, и он должен быть безотлагательно переведен. Если вам нужен перевод данного документа, пожалуйста, свяжитесь с директором по вопросам многообразия (Diversity Director) компании MassDEP по указанному ниже телефону.

Arabic العربية

هذه الوثيقة مهمة وبجب ترجمتها على الفور. إذا كنت بحاجة إلى هذه الوثيقة مترجمة، برجي الاتصال بمدير التنوع PMassDE على أرقام الهواتف المدرجة أدناه.

한국어 Korean

이 문서는 중요하고 즉시 번역해야 합니다. 이 문서의 번역이 필요하시다면, 아래의 전화 번호로 MassDEP의 다양성 담당 이사에 문의하시기 바랍니다.

հայերեն Armenian

Այս փաստաթուղթը կարևոր է և պետք է անմիջապես թարգմանվի։ Եթե Ձեզ անիրաժեշտ է այս փաստաթուղթը թարգմանել, դիմեք MassDEP-ի բազմազանության տնօրենին ստորև նշված հեռախոսահամարով։

Farsi Persian فارسی

این سند مهم است و باید فورا ترجمه شود. اگر به ترجمه این سند نیاز دارید، لطفا با مدیر بخش نتوع نژادی MassDEP به شماره تلفن ذکر شده در زیر تماس بگیرید.

Français French

Ce document est important et devrait être traduit immédiatement. Si vous avez besoin de ce document traduit, veuillez communiquer avec le directeur de la diversité MassDEP aux numéros de téléphone indiqués ci-dessous.

Deutsch German

Dieses Dokument ist wichtig und sollte sofort übersetzt werden. Sofern Sie eine Übersetzung dieses Dokuments benötigen, wenden Sie sich bitte an den Diversity Director MassDEP unter der unten aufgeführten Telefonnummer.

Ελληνική Greek

Το παρόν έγγραφο είναι σημαντικό και θα πρέπει να μεταφραστεί αμέσως. Αν χρειάζεστε μετάφραση του παρόντος εγγράφου, παρακαλούμε επικοινωνήστε με τον Διευθυντή Διαφορετικότητας του MassDEP στους αριθμούς τηλεφώνου που αναγράφονται παρακάτω.

Italiano Italian

Comunicazione per parti che non parlano inglese. Questo documento è importante e dovrebbe essere tradotto immediatamente. Se avete bisogno di questo documento tradotto, potete contattare il Direttore di Diversità di MassDEP al numero di telefono elencato di seguito.

Język Polski Polish

Dokument ten jest ważny i powinien zostać natychmiast przetłumaczony. Jeśli potrzebujesz przetłumaczonej wersji dokumentu, prosimy o kontakt z dyrektorem ds. różnorodności MassDEP pod jednym z numerów telefonu wymienionych poniżej.

हिन्दी Hindi

यह दस्तावेज महत्वपूर्ण है और इसका तुरंत अनुवाद किया जाना चाहिए. यदि आपको इस दस्तावेज़ का अनुवाद करने की आवश्यकता है, तो कृपया नीचे सूचीबद्ध टेलीफोन नंबरों पर मासडेप्स डाइवर्सिटी के निदेशक से संपर्क करें.

Contact Dencen Simpson 857-406-0738 Massachusetts Department of Environmental Protection 100 Cambridge Street 9th Floor Boston, MA 02114 TTY# MassRelay Service 1-800-439-2370 - https://www.mass.cov/environmental-ustice (Version revised 4.21.2023) 310 CMR 1.03(5)(a) [THIS PAGE IS INTENTIONALLY LEFT BLANK]
NORTH LAKE COCHICHEWICK **BOAT LAUNCH**

TOWN OF NORTH ANDOVER, MA

C-1 EXISTING CONDITIONS C-2 EROSION CONTROL AND DEWATERING PLAN C-3 DEMOLITION PLAN C-4 GRADING AND DRAINAGE PLAN C-5 SITE PLAN SITE RESTORATION PLAN C-6 CD-1 - CD-6 CIVIL DETAILS

GENERAL NOTES AND LEGEND

INDEX G-1

JULY 2024 FOR PERMITTING









TOWN OF NORTH ANDOVER. MA



PETER BOYNTON - PLANING BOARD AND HARBORMASTER TED KELLEY - PROJECT PROPONENT JEAN ENRIGHT - DIRECTOR OF PLANNING JOHN BORGESI, PE - TOWN ENGINEER **AMY MAXNER - CONSERVATION ADMINISTRATOR**



GENERAL NOTES:

- BASE MAP INFORMATION IS FROM A FIELD SURVEY PERFORMED BY ZENITH LAND SURVEYORS, LLC. ON 1. NOVEMBER 17 2022, HORIZONTAL DATUM IN U.S. SURVEY FEET IS REFERENCED TO THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD83). VERTICAL DATUM IN U.S. SURVEY FEET REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
- 2. PROPERTY LINE, STREET LINE AND OWNER INFORMATION WAS COMPILED FROM RECORDS ON FILE AT THE NORTHERN ESSEX COUNTY REGISTRY OF DEEDS OFFICE AND THE NORTH ANDOVER ASSESSING DEPARTMENT. ABUTTING PARCELS COMPILED FROM MASSGIS AND SHOULD BE CONSIDERED APPROXIMATE FOR THE PURPOSE OF THIS PLAN. SUBJECT SITE IS IN A RESIDENTIAL ZONE AS DEPICTED ON THE TOWN OF NORTH ANDOVER ZONING MAP.
- 3. ALL EXISTING UTILITIES SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL NOTIFY DIG SAFE AT LEAST 72 HOURS IN ADVANCE, EXCLUDING WEEKENDS AND HOLIDAYS, PRIOR TO ANY EXCAVATION.
- 4. DO NOT SCALE DRAWINGS UNLESS OTHERWISE NOTED. WRITTEN DIMENSIONS AND STATIONING SHALL PREVAIL. REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY.
- 5. THE CONTRACTOR SHALL RESTORE ALL PUBLIC AND PRIVATE PROPERTY TO ITS PRE-CONSTRUCTION CONDITION AT NO ADDITIONAL COST TO THE OWNER UNLESS NOTED TO BE ALTERED.
- 6. ALL EXISTING STORM DRAIN, SEWER, AND WATER MAIN LINES ENCOUNTERED DURING CONSTRUCTION ARE TO REMAIN IN SERVICE UNLESS OTHERWISE NOTED. THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER SHALL REPAIR ANY EXISTING SEWERS, STORM DRAIN LINES, WATER LINES OR CULVERTS DAMAGED DURING CONSTRUCTION.
- 7. IN THOSE INSTANCES WHERE POWER OR TELEPHONE POLE SUPPORT IS REQUIRED, THE CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE UTILITY COMPANY TO OBTAIN REQUIRED SERVICE. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR TEMPORARY BRACING OF UTILITIES OR FOR ANY RELATED DELAYS.
- 8. ALL STRUCTURES AND PIPELINES LOCATED ADJACENT TO THE TRENCH EXCAVATION SHALL BE PROTECTED AND SUPPORTED BY THE CONTRACTOR UNTIL THE TRENCH IS BACKFILLED. DAMAGE TO ANY SUCH STRUCTURE CAUSED BY, OR RESULTING FROM, THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER, ALL UTILITIES REQUIRING REPAIR, RELOCATION, OR ADJUSTMENT AS A RESULT OF THE PROJECT SHALL BE COORDINATED BY THE CONTRACTOR, THROUGH THE RESPECTIVE UTILITY AND THE OWNER.
- 9. THE CONTRACTOR SHALL TAKE SPECIAL CARE NOT TO DAMAGE TREES, BUSHES, PLANTS, PARKING METERS, FLOWERS, STONEWALLS, FENCES, ETC. WITHIN THE CONSTRUCTION AREA UNLESS THEY ARE NOTED TO BE REMOVED. CONTRACTOR SHALL REPLACE ALL DAMAGED ITEMS AT NO ADDITIONAL COST TO OWNER.
- 10. THE CONTRACTOR SHALL REMOVE AND REPLACE NEW, OR REPAIR, ALL CURBS, SIDEWALKS, PAVEMENT AND OTHER ITEMS DAMAGED BY HIS CONSTRUCTION ACTIVITIES TO AT LEAST THEIR ORIGINAL CONDITION, AND TO THE SATISFACTION OF THE OWNER AND ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
- 11. THE CONTRACTOR SHALL BE REQUIRED TO FURNISH AND MAINTAIN A TELEPHONE NUMBER WHERE THE CONTRACTOR CAN BE REACHED 24 HOURS A DAY, 7 DAYS A WEEK.
- 12. THE LOCATION AND LIMITS OF ALL ON-SITE WORK AND STORAGE AREAS SHALL BE REVIEWED/COORDINATED WITH, AND ACCEPTABLE TO THE TOWN AND THE ENGINEER. THE CONTRACTOR SHALL LIMIT HIS ACTIVITIES TO THESE AREAS.
- 13. THE CONTRACTOR SHALL IDENTIFY AND OBTAIN ALL NECESSARY PERMITS FOR WORK IN ROADWAYS AND TRENCHES. THE CONTRACTOR IS RESPONSIBLE FOR CONFORMING TO ALL PERMITS AS AN INTEGRAL PART OF HIS WORK
- 14. THE CONTRACTOR SHALL SAW CUT ALL PAVEMENT TO ITS FULL DEPTH IN THE PROCESS OF INSTALLING NEW UTILITIES IN ALL PAVED AREAS INCLUDING STREETS, DRIVEWAYS, AND SIDEWALKS.
- 15. TEST PITS MAY BE ORDERED BY THE ENGINEER TO DETERMINE THE LOCATION OF EXISTING UTILITIES. THE CONTRACTOR MAY REQUEST TEST PITS TO VERIFY EXISTING UTILITIES AT NO ADDITIONAL COSTS TO THE
- 16. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
- 17. CONCRETE WASHOUT AREAS SHALL BE OUTSIDE THE BUFFER ZONES OF ALL WETLAND RESOURCE AREAS THE WASHOUT AREA MUST BE INSTALLED WITH AN IMPERMEABLE LINER OR A PREFABRICATED CONCRETE WASHOUT CONTAINER
- 18. THE LOCKING BOLLARDS SHOWN ON C-6 ARE REQUIRED TO LIMIT TRAILER ACCESS TO THE BOAT RAMP FOR EXCLUSIVE USE BY THE TOWN OF NORTH ANDOVER FIRE RESCUE. LAKE REGULATIONS PROMULGATED BY THE SELECT BOARD PROHIBIT ANY TRAILER LAUNCHING BOATS INTO THE LAKE BY THE GENERAL PUBLIC. THE NORTH ANDOVER FIRE DEPARTMENT SHALL BE RESPONSIBLE FOR KEEPING THE LOCKING BOLLARDS LOCKED.

SUGGESTED SEQUENCE OF WORK:

- NO CONSTRUCTION SHALL BEGIN UNTIL ANY AND ALL PERMITS ARE OBTAINED FROM THE TOWN OF NORTH ANDOVER
- 2. STAKE LIMITS OF CLEARING.
- 3. INSTALL EROSION CONTROL MEASURES, TURBIDITY CURTAIN, AND COFFERDAM, SCHEDULE INSPECTIONS WITH THE TOWN IN ACCORDANCE WITH THE OOC.
- PERFORM CLEARING AND GRUBBING AS NECESSARY. PERFORM PAVEMENT DEMOLITION AT DRIVEWAY 4. APRON
- INSTALL CONSTRUCTION ENTRANCE. 5.
- PERFORM DEMOLITION OF EXISTING STRUCTURES ON OR APPURTENANT TO THE SITE (INCLUDING THE EXISTING RETAINING WALL, BOAT LAUNCH RAMP, ETC.). DISPOSE OF DEBRIS IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
- PERFORM EARTHWORK CUT AND FILLS FOR ROUGH GRADE ALONG WATERFRONT.
- CONSTRUCT RETAINING WALL, REVETMENT, AND BOAT LAUNCH RAMP. 8.
- REMOVE DEWATERING CONTROLS AND RE-ESTABLISH EROSION CONTROL MEASURES AROUND LIMITS OF 9. CURRENT WORK AREA.
- 10. PERFORM EARTHWORK CUT AND FILLS FOR ROUGH GRADE THROUGHOUT REMAINING WORK AREA.
- 11. INSTALL UTILITIES AND STORMWATER SYSTEM (INCLUDING DRAINAGE STRUCTURES AND PIPING), PERFORM FINE GRADING, CONSTRUCT RAIN GARDENS, AND PREPARE SUBGRADE FOR DRIVEWAY, PATHWAY, AND
- 12. PERMANENT/ FINAL STABILIZATION.
- 13. REMOVE CONSTRUCTION ENTRANCE AND PERIMETER EROSION CONTROLS.

AB	BRE	VIATIONS		
BIT		BITUMINOUS		
BO	w	BOTTOM OF WALL		
CB		CATCH BASIN		
CI		CAST IRON	7 7	т
со	NC	CONCRETE		G
D		DRAIN		OHW —
DIA	4	DIAMETER		
DN	1H	DRAIN MANHOLE		0
EO	Р	EDGE OF PAVEMENT	w	
EL		ELEVATION		
EX		EXISTING		-
FM	I	FORCEMAIN		Ø
ID		INSIDE DIAMETER	D	D
IN\	/	INVERT		S
LD		LANDSCAPE AREA	s-	S
LF		LINEAR FEET		2
MA	x	MAXIMUM		-
MI	N	MINIMUM		60 -
MS	E	MECHANICALLY STABILIZED EARTH		55 —
M	v	MONITORING WELL		v
OC		ON CENTER		8 WF
PR	OP	PROPOSED		2
RC	Р	REINFORCED CONCRETE PIPE		5
R&	D	REMOVE AND DEMOLISH		7
R&	S	REMOVE AND SALVAGE		
R&	R	REMOVE AND RESET		
RE	г.	RETAINING		
S		SEWER		▼BH
SⅣ	н	SEWER MANHOLE		
то	в	TOP OF BANK		1
то	w	TOP OF WALL		6 70.
TY	Ρ.	TYPICAL		OHW —
w		WATER	—— FZ -	— F
WF		WETLAND FLAG		

- WG WATER GATE
- UP UTILITY POLE

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GENERAL N

LEGEND

EXISTING

	PROPERTY LINE	• • • • • • •	SILT FENCE AND FIL
<u> </u>	METAL GUARDRAIL	o	TURBIDITY CURTAIN
J.	UTILITY POLE	~~~~~	COFFERDAM
OHW	ELECTRICAL OVERHEAD WIRE	<u> </u>	GUARDRAIL
Þ	WATER GATE VALVE		LIMIT OF WORK
ЭС.	HYDRANT	<u> </u>	CONTOUR
- w w	WATER MAIN	×10,5470\$2	RIPRAP
	CATCH BASIN	DD	DRAIN PIPE
D	DRAIN MANHOLE	D	DRAIN MANHOLE (DI
- D D	DRAIN LINE		R&D SURFACE
S	SEWER MANHOLE		R&D RETAINING WA
-ss	SEWER LINE		R&R GUARDRAIL, SV
(i)	DECIDUOUS TREE	imes ^{54.09}	SPOT GRADE
۲	CONIFEROUS TREE	xx	FENCE
— 60 · —	MAJOR CONTOUR	Δ	FLARED END SECTION
— 55 — —	MINOR CONTOUR		OVERFLOW DRAIN S
WL WL	WETLAND		RETAINING WALL
6 WF#	WETLAND FLAG AND NUMBER		LOAM & SEED
- 25	25' NO DISTURB ZONE	+,+,+,+,+	STONE FILLED PAVE
- 50	50' NO BUILD ZONE	₩ + + + +	GRASS FILLED PAVE
- 75	DISTRICT CONSERVATION ZONE		BIORETENTION ARE
100 100	100' WETLAND BUFFER		REVETMENT
	DISTRICT NON-DISTURBANCE ZONE	1050505050505050505050	CONSTRUCTION EN
🕀 BH EP #	BORING		HANDHOLE W/ COVE
▲	BENCHMARK	—EE	UNDERGROUND ELE
· · <u> </u>	TOP OF BANK		PAVEMENT
в тов#	TOP OF BANK FLAG AND NUMBER		
OHW	ORDINARY HIGH WATER MARK		
FZ — FZ —	100-YEAR FEMA FLOOD ZONE		

PROPOSED

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TH LAKE COCHICHEWICK BOAT LAUNCH TOWN OF NORTH ANDOVER, MA

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Sheet No.







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34" DRAWING R.IP Checked b RJP MARK DATE DESCRIPTION Approved b

GENERAL PLANTING PLAN NOTES:

- THE PLANTING AREA SHALL BE EXCAVATED TO THE ELEVATIONS SHOWN ON THE GRADING PLAN ON SHEET C-4.
- 2. FOR ALL SLOPES GREATER THAN 3H:1V, ADD THE EROSION CONTROL BLANKET.
- THE CONTRACTOR WILL WORK WITH REPRESENTATIVES OF THE CONSERVATION COMMISSION TO IDENTIFY THE LOCATION/DISTRIBUTION OF PLANTINGS WITHIN THE PLANTING AREAS. THE CONTRACTOR WILL INITIALLY STAKE OUT PROPOSED LOCATIONS FOR REVIEW AND APPROVAL BY THE CONSERVATION COMMISSION OR ITS AGENT
- THE CONTRACTOR SHALL ATTEMPT TO PROTECT ALL TREES 6-INCHES IN DIAMETER OR LARGER. TREE SPECIES SHALL BE SELECTED FROM 4. THE NORTH ANDOVER APPROVED PLANT MATERIALS LIST AND SUBMITTED TO THE CONSERVATION COMMISSION FOR APPROVAL PRIOR TO PURCHASING AND INSTALLING PLANTINGS. ALL TREES REMOVED THAT ARE 6-INCHES IN DIAMETER OR LARGER SHALL BE REPLACED AS FOLLOWS:
 - 4.1 SIZE: 2+ GALLON(S) OR 4'-5' OR LARGER
 - 4.2 SPACING 10'-15' ON CENTER
 - 4.3 TOTAL NUMBER: TO BE DETERMINED DURING CONSTRUCTION
 - 4.4 TYPE: TREES SHALL BE GROWN NATIVE FROM THE FOLLOWING LIST:
 - A. RED MAPLE ACER RUBRUM
 - B. AMERICAN HORNBEAM CARPINUS CAROLINIANA C. AMERICAN MOUNTAIN ASH SORBUS AMERICANA

 - D. PAPER BIRCH BETULA PAPYRIFERA
- 5. PLANTINGS SHALL CONSIST OF SHRUBS, AND SEED MIX. FOR SEEDING SEE DETAIL ON THIS SHEET. SHRUB SPECIES SHALL BE SELECTED FROM THE NORTH ANDOVER APPROVED PLANT MATERIALS LIST AND SUBMITTED TO THE CONSERVATION COMMISSION FOR APPROVAL PRIOR TO PURCHASING AND INSTALLING PLANTINGS. SHRUBS SHALL BE INSTALLED AS FOLLOWS:
 - 5.1 SIZE: 3'-4'
 - 5.2 SPACING 8'-10' ON CENTER

CL

ENVI

— An A

- 5.3 TOTAL NUMBER: 25
- 5.4 SHRUBS SHALL BE GROWN NATIVE FROM THE FOLLOWING LIST:
 - A. SUMMER SWEET CLETHRA ALNIFOLIA
 - B. COMMON WINTERBERRY LLEX VERTICILLATA
 - C. RASPBERRY RUBUS IDAEUS
 - D. FLDERBERRY SAMBUCUS CANADENSIS
 - E. MEADOWSWEET SPIRAEA ALBA VAR. LATIFOLIA
- 6. ALL PLANTINGS SHALL BE REMOVED FROM BURLAP SACKS, WIRE CAGES AND PLASTIC CONTAINERS PRIOR TO PLANTING.
- 7. EACH PLANT SHALL HAVE ITS ROOTS LOOSENED PRIOR TO PLANTING TO ENCOURAGE ROOT GROWTH AWAY FROM THE ROOT BALL.

ARIES- SEE PLANS

PLANTING HOLES SHALL BE DUG A MINIMUM OF 2X DIAMETER OF THE ROOT BALL TO REDUCE SOIL COMPACTION AND ALLOW FOR HEALTHY ROOT ESTABLISHMENT

CL

NATIVE PLANTS MONITORING PLAN NOTES:

- MONITORING AND REPORTING ASSOCIATED WITH THE COMPLETED NATIVE PLANTING AREA SHOULD FOLLOW AND BE IN COMPLIANCE 1. WITH THE ORDER OF CONDITIONS ISSUED BY THE CONSERVATION COMMISSION AND ANY OTHER RELEVANT PERMIT THAT APPLIES.
- 2. ANNUAL REPORTING AND ANY DELIVERABLES WILL BE SUBMITTED TO THE APPLICABLE PERMITTING AUTHORITIES.
- POST PLANTING. THE AREA WILL BE MONITORED AS REQUIRED BY THE ORDER OF CONDITIONS FOR A PERIOD OF TWO YEARS. TO 3. CONDUCT VISUAL ASSESSMENT TO DETERMINE IF FURTHER ACTION IS NECESSARY TO REMOVE AND REPLACE DEAD PLANTS, REMOVE ACCUMULATED DEBRIS, AND TO REMOVE ANY UNWANTED AND COMPETING INVASIVE PLANTS.
- SHOULD THE AREA EXPERIENCE AN UNUSUAL FLOOD EVENT, AN ADDED SITE VISIT WILL BE CONDUCTED TO ASSESS ANY DAMAGE AND 4. TO TAKE RADIATION ACTION
- THE INTENT IS TO HAVE THE PLANTED AREAS ACHIEVE 75% GROWTH IN COVER AND MATURITY AT THE END OF THE TWO-YEAR MONITORING PERIOD.
- EVERY OPPORTUNITY WILL BE TAKEN TO REMOVE INVASIVE PLANTS SO THEY ARE WEAKENED ALLOWING THE INDIGENOUS PLANTINGS 6. TO TAKE OVER AND THRIVE
- IF THE PLANTS GET DISTRESSED DURING THE MONITORING PERIOD, AN EXAMINATION OF THE SOIL SHALL DETERMINE IF THE SOIL PH BALANCE NEEDS ADJUSTMENT OR PLANT FERTILIZATION IS NEEDED.



PLANT SPACING (`A')	ROW SPACING ('B')
6 IN. O.C.	5 IN. O.C.
8 IN. O.C.	7 IN. O.C.
10 IN. O.C.	8-1/2 IN. O.C.
12 IN. O.C.	10-1/2 IN. O.C.
15 IN. O.C.	13 IN. O.C.
18 IN. O.C.	16 IN. O.C.
24 IN. O.C.	21 IN. O.C.
30 IN. O.C.	26 IN. O.C.

PERENNIAL PLANTING LAYOUT SCALE: N.T.S

	OF NORTH	AND
TOW		ONER
2	e aller	A
	SACHU	SETTS

RONMENTAL	
PARTNERS	Carlo COM
pex Company —	

SHRUB AND PERENNIAL PLANTING, TYP

	MENTH OF MALSH			Scale Date	AS NOTED JULY 2024		NORTH LAKE C
	PAUL RYAN J.			Job No.	22003302		
DC	8 CIVIL 3	26		Designed by	JLV	THIS LINE IS ONE INCH	
IN O	18 CUSTERS AL			Drawn by	AES	FULL SCALE ON A 22" X	
	SOIONAL ENGINE			Checked by	RJP	34" DRAWING	
iy —	01/22/2024	MARK DATE	DESCRIPTION	Approved by	RJP		
у —	Orizzizoza	MARK DATE	DESCRIPTION	Checked by Approved by	RJP RJP	FULL SCALE ON A 22" X 34" DRAWING	

- SET CROWN OF ROOTBALL 1" ABOVE FINISHED SOIL GRADE

2" DEPTH COMPOSTED BARK MULCH,

REMOVE ROPES, WIRES, & NON-BIODEGRADABLE MATERIALS FROM ROOTBALL, LOOSEN ROOT BOUND ROOTBALLS OF CONTAINER

KEEP FREE OF TRUNK/STEMS

PLANTING SOIL

GROWN SHRUBS

COMPACTED SUBGRADE











IDENTIFI-	SIZE OF SIGN (INCHES)		TEXT	TEXT DIMENSIONS (INCHES)		NUMBER OF COLOR		LOR	POST SIZE AND	UNIT AREA IN	AREA IN
NUMBER	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	SIGNS REQUIRED	BACK- GROUND LEG	END BORDER	NUMBER REQUIRED	SQUARE FEET	FEET
R6-1L	36	12		MUTCD STANDARD		1	MU ⁻ STAN	ICD DARD	P5 (1)	3.00	3.00
R6-1R	36	12	ONE WAY			1			P5 (1)	3.00	6.00
R6-1(PBS)	36	12	ONE WAY			2			P5 (2)	3.00	6.00
R7-8 (MOD)	12	18	Reserved Parking E			1			P5 (1)	1.50	1.50
R7-7 (MOD)	12	18	TRAILER PARKING ONLY			2			P5 (2)	1.50	3.00
R5-3 (MOD)	24	24	NO TRAILER ACCESS			1			P5 (1)	4.00	4.00





TYPICAL SIGNPOST SCALE: N.T.S.

NI	പ	F	9

NOTES: 1. SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES 2009 EDITION WITH LATEST REVISIONS AND MASSACHUSETTS AMENDMENTS FOR LATEST SPECIFICATIONS ON TEXT DIMENSIONS AND COLOR.

ON TEXT DIMENSIONS AND COLOR.
HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. THE 2009 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", THE 1990 MDPW "STANDARD DRAWINGS FOR SIGNS AND SUPPORTS", AND ALL AMENDMENTS WILL GOVERN.
PRIOR TO ORDERING SIGNAGE, THE CONTRACTOR SHALL FIELD VERIFY SIGNAGE TO BE REPLACED WITH THE TOWN AND SUBMIT SHOP DRAWINGS OF ALL PROPOSED SIGNAGE FOR REVIEW AND APPROVAL BY THE TOWN.





12212024	MARK	DATE	DESCRIPTINON	Approved by	RJP		
122/2024				Checked by	RJP	34" DRAWING	CIVIL DETAILS
lint				Drawn by	AES	FULL SCALE ON A 22" X	
	2			Designed by	JLV	THIS LINE IS ONE INCH	
				Job No.	22003302		TOWN OF NORTH ANDOVER, MA
1				Date	JULY 2024		
				Scale	AS NOTED		

Sheet N	0.		
	С	D-	6

PERMITTING

Ch. 91 Permit Placeholder

(To be provided prior to construction)

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Appendix D

Sections of Massachusetts General Laws

APPENDIX E

APPLICABLE COMMONWEALTH OF MASSACHUSETTS STATUTES

These following amend or supplement the Standard General Conditions of the Construction Contract (No. C-700, 2013 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

M.G.L c.30 s 39F Payment to Subcontractor

Section 39F. (1) Every contract awarded pursuant to sections forty-four A to L, inclusive, of chapter one hundred and forty-nine shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to section thirty-nine M of chapter thirty shall contain the following subparagraphs (a) through (h) and in each case those subparagraphs shall be binding between the general contractor and each subcontractor.

(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the general contractor for the account of that subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor as provided in subparagraphs (a) and (b), the awarding authority shall act upon the demand as provided in this section.

(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the

subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor.

(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided, that the awarding authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interestbearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

(h) The awarding authority shall deduct from payments to a general contractor amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor.

(i) If the subcontractor does not receive payment as provided in subparagraph (a) or if the general contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the subcontractor may demand direct payment by following the procedure in subparagraph (d) and the general contractor may file a sworn reply as provided in that

same subparagraph. A demand made after the first day of the month following that for which the subcontractor performed or furnished the labor and materials for which the subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general contractor. Thereafter the awarding authority shall proceed as provided in subparagraph (e), (f), (g) and (h).

(2) Any assignment by a subcontractor of the rights under this section to a surety company furnishing a bond under the provisions of section twenty-nine of chapter one hundred forty-nine shall be invalid. The assignment and subrogation rights of the surety to amounts included in a demand for direct payment which are in the possession of the awarding authority or which are on deposit pursuant to subparagraph (f) of paragraph (1) shall be subordinate to the rights of all subcontractors who are entitled to be paid under this section and who have not been paid in full.

(3) "Subcontractor" as used in this section (i) for contracts awarded as provided in sections forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall mean a person who files a sub-bid and receives a subcontract as a result of that filed sub-bid or who is approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, (ii) for contracts awarded as provided in paragraph (a) of section thirty-nine M of chapter thirty shall mean a person approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, (iii) for contracts awarded as provided in paragraph (a) of section thirty-nine M of chapter thirty shall mean a person approved by the awarding authority in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the general contractor, and (iii) for contracts with the commonwealth not awarded as provided in forty-four A to forty-four H, inclusive, of chapter one hundred forty-nine shall also mean a person contracting with the general contractor to supply materials used or employed in a public works project for a price in excess of five thousand dollars.

(4) A general contractor or a subcontractor shall enforce a claim to any portion of the amount of a demand for direct payment deposited as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the other and the bank shall not be a necessary party. A subcontractor shall enforce a claim for direct payment or a right to require a deposit as provided in subparagraph (f) of paragraph 1 by a petition in equity in the superior court against the awarding authority and the general contractor shall not be a necessary party. Upon motion of any party the court shall advance for speedy trial any petition filed as provided in this paragraph. Sections fifty-nine and fifty-nine B of chapter two hundred thirty-one shall apply to such petitions. The court shall enter an interlocutory decree upon which execution shall issue for any part of a claim found due pursuant to sections fifty-nine and fifty-nine B and, upon motion of any party, shall advance for speedy trial the petition to collect the remainder of the claim. Any party aggrieved by such interlocutory decree shall have the right to appeal therefrom as from a final decree. The court shall not consolidate for trial the petition of any subcontractor with the petition of one or more subcontractors or the same general contract unless the court finds that a substantial portion of the evidence of the same events during the course of construction (other than the fact that the claims sought to be consolidated arise under the same general contract) is applicable to the petitions sought to be consolidated and that such consolidation will prevent unnecessary duplication of evidence. A decree in any such proceeding shall not include interest on the disputed amount deposited in excess of the interest earned for the period of any such deposit. No person except a subcontractor filing a demand for direct payment for which no funds due the general contractor are available for direct payment shall have a right to file a petition in court of equity against the awarding authority claiming a demand for direct payment is premature and such subcontractor must file the petition before the awarding authority has made a direct payment to the subcontractor and has made a deposit of the disputed portion as provided in part (iii) of subparagraph (e) and in subparagraph (f) of paragraph (1).

(5) In any petition to collect any claim for which a subcontractor has filed a demand for direct payment the court shall, upon motion of the general contractor, reduce by the amount of any deposit of a disputed amount by the awarding authority as provided in part (iii) of subparagraph (e) and in subparagraph (f) of paragraph (1) any amount held under a trustee writ or pursuant to a restraining order or injunction.

M.G.L c.30 S 39i Deviation from plans and Specifications

M.G.L c.30 s 39J No Arbitrary Decisions are Final

M.G.L c.30 s 39L Construction Work by Foreign Corporations

M.G.L c.30 s 39M(b) Substitution of Equal Products

M.G.L c.30 s 39N Differing Site Conditions

Section 39N. Every contract subject to section forty-four A of chapter one hundred and forty-nine or subject to section thirty-nine M of chapter thirty shall contain the following paragraph in its entirety and an awarding authority may adopt reasonable rules or regulations in conformity with that paragraph concerning the filing, investigation and settlement of such claims:

If, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract shall be modified in writing accordingly.

M.G.L c.30 s 39O Equitable Adjustments for Delays

Section 39O. Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety and, in the event a suspension, delay, interruption or failure to act of the awarding authority increases the cost of performance to any subcontractor, that subcontractor shall have the same rights against the general contractor for payment for an increase in the cost of his performance as provisions (a) and (b) give the general contractor against the awarding authority, but nothing in provisions (a) and (b) shall in any way change, modify or alter any other rights which the general contractor or the subcontractor may have against each other.

(a) The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen days or more or due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions.

(b) The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim.

M.G.L c.30 s 39P Decision on Interpretation of Specifications

M.G.L c.30 s 39R Contractor's Records

M.G.L c.149 s 34 Limitations on Hours of Work

M.G.L c.149 s 44J Advertising Invitations to Bid

M.G.L c.82 s 40 Excavations; Notice; Penalties

M.G.L c.30 s 38A Excavations; Notice; Penalties

Section 38A. Contracts for road and bridge projects awarded as a result of a proposal or invitation for bids under section 39M shall include a price adjustment clause for each of the following materials: fuel, both diesel and gasoline; asphalt; concrete; and steel. Contracts for water and sewer projects awarded as a result of a proposal or invitation for bids under said section 39M shall include a price adjustment clause for fuel, both diesel and gasoline; liquid asphalt; and portland cement contained in cast-in-place concrete. A base price for each material shall be set by the awarding authority or agency and shall be included in the bid documents at the time the project is advertised. The awarding authority or agency shall also identify in the bid documents the price index to be used for each material. The price adjustment clause shall provide for a contract adjustment to be made on a monthly basis when the monthly cost change exceeds plus or minus 5 per cent.

Appendix E

Asphalt and Fuel Price Adjustments

DOCUMENT 00814

SPECIAL PROVISIONS PRICE ADJUSTMENT FOR PORTLAND CEMENT CONCRETE MIXES

January 12, 2009

This provision applies to all projects using greater than 100 Cubic Yards (76 Cubic Meters) of Portland cement concrete containing Portland cement as stipulated in the Notice to Contractors section of the Bid Documents. This Price Adjustment will occur on a monthly basis.

The Price Adjustment will be based on the variance in price for the Portland cement component only from the Base Price to the Period Price. It shall not include transportation or other charges.

The Base Price of Portland cement on a project is a fixed price determined at the time of bid by the Department by using the same method as for the determination of the Period Price (see below) and found in the Notice to Contractors.

The Period Price of Portland cement will be determined by using the latest published price, in dollars per ton (U.S.), for Portland cement (Type I) quoted for Boston, U.S.A. in the <u>Construction Economics</u> section of *ENR Engineering News-Record* magazine or at the ENR website http://www.enr.com under <u>Construction Economics</u>. The Period Price will be posted on the MassHighway website the Wednesday immediately following the publishing of the monthly price in ENR, which is normally the first week of the month.

The Contract Price of the Portland cement concrete mix will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

The price adjustment applies only to the actual Portland cement content in the mix placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M4.02.01. No adjustments will be made for any cement replacement materials such as fly ash or ground granulated blast furnace slag.

The Price Adjustment will be a separate payment item. It will be determined by multiplying the number of cubic yards of Portland cement concrete placed during each monthly period times the Portland cement content percentage times the variance in price between the Base Price and Period Price of Portland cement.

This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is a Department-approved extension of time.

END OF DOCUMENT

DOCUMENT 00812

SPECIAL PROVISIONS MONTHLY PRICE ADJUSTMENT FOR DIESEL FUEL AND GASOLINE – ENGLISH UNITS

Revised: 01/26/2009

This monthly fuel price adjustment is inserted in this contract because the national and worldwide energy situation has made the future cost of fuel unpredictable. This adjustment will provide for either additional compensation to the Contractor or repayment to the Commonwealth, depending on an increase or decrease in the average price of diesel fuel or gasoline.

This adjustment will be based on fuel usage factors for various items of work developed by the Highway Research Board in Circular 158, dated July 1974. These factors will be multiplied by the quantities of work done in each item during each monthly period and further multiplied by the variance in price from the Base Price to the Period Price.

The Base Price of Diesel Fuel and Gasoline will be the price as indicated in the Department's web site (www.mhd.state.ma.us) for the month in which the contract was bid, which includes State Tax.

The Period Price will be the average of prices charged to the State, including State Tax for the bulk purchases made during each month.

This adjustment will be effected only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

No adjustment will be paid for work done beyond the extended completion date of any contract.

Any adjustment (increase or decrease) to estimated quantities made to each item at the time of final payment will have the fuel price adjustment figured at the average period price for the entire term of the project for the difference of quantity.

The fuel price adjustment will apply <u>only</u> to the following items of work at the fuel factors shown:

ITEMS COVERED	FUEL FACTORS			
	Diesel	Gasoline		
Excavation: and Borrow Work: Items 120, 120.1, 121, 123, 124, 125, 127, 129.3, 140, 140.1, 141, 142, 143, 144., 150, 150.1, 151 and 151.1 (Both Factors used)	0.29 Gallons / CY.	0.15 Gallons / CY		
Surfacing Work: All Items containing Hot Mix Asphalt	2.90 Gallons / Ton	Does Not Apply		

******** END OF DOCUMENT *******

Appendix F

MassDOT Traffic Management Details

NOTES:

- 1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS, UNLESS SUPERCEDED BY THESE PLANS.
- 2. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
- 3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
- 4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES, AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
- 5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
- 6. CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT, AND SIMILAR OPERATIONS.
- 7. THE FIRST FIVE PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH TYPE A LIGHTS.
- 8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
- 9. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
- 10. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
- 11. MINIMUM LANE WIDTH IS TO BE 11 FEET (3.3m) UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.

12. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

	EGEND:				
۲	REFLECTORIZED PLASTIC DRUM		WORK ZONE		WORK VEHICLE
	OR 36 CONE	\rightarrow	DIRECTION OF TRAFFIC	\square	TRUCK MOUNTED ATTENUATOR
P/F	POLICE/FLAGGER DETAIL	₽	IMPACT ATTENUATOR		TRAFFIC OR PEDESTRIAN SIGNAL
	TYPE III BARRICADE		MEDIAN BARRIER	_●_	SIGN
	CHANGEABLE MESSAGE SIGN	F	MEDIAN BARRIER WITH		
	ARROW BOARD		WARNING LIGHTS		

THE IDEAL CAPACITY OF A MAJOR HIGHWAY IS GENERALLY CONSIDERED TO BE 1900 PASSENGER CARS PER HOUR PER LANE (PCPHPL). IN WORK ZONES ON A MULTI-LANE DIVIDED HIGHWAY, THE FOLLOWING VOLUME GUIDELINES HAVE BEEN SUGGESTED:

MEASURED AVERAGE WORK ZONE CAPACITIES

NUMBER	OF LANES	NUMBER OF STUDIES	AVERAGE CAPACITY		
NORMAL (EXISTING)	OPEN (TO_TRAFFIC)				
	(_	VI 11	VIIII L	
3 2 5	1 1 2	7 8 8	1,170 1,340 2,740 2,960	1,170 1,340 1,370 1,480	
3 4	2 3	9 4	2,980 2,980 4,560	1,490 1,520	

Source: Dudek, C., <u>Notes on Work Zone Capacity and Level of Service</u>. Texas Transportation Institute, Texas A&M University, College Station, Texas (1984)

BY OBTAINING HOURLY TRAFFIC COUNTS FOR A PARTICULAR ROADWAY (WITH A MINIMUM OF A 48-HOUR AUTOMATIC TRAFFIC RECORDER (ATR) COUNT), THIS WILL HELP TO DETERMINE AT WHAT TIMES OF THE DAY OR NIGHT A CERTAIN NUMBER OF LANES MAY BE CLOSED.



Notes for Traffic Management FIGURE GEN-1

GENERAL GUIDELINES

SUGGESTED WORK ZONE WARNING SIGN SPACING

	DISTANCE BETWEEN SIGNS **			
ROADTIFE	A	В	С	
LOCAL OR LOW VOLUME ROADWAYS*	350 (100)	350 (100)	350 (100)	
MOST OTHER ROADWAYS*	500 (150)	500 (150)	500 (150)	
FREEWAYS AND EXPRESSWAYS*	1,000 (300)	1,500 (450)	2,640 (800)	

- * ROAD TYPE TO BE DETERMINED BY MASSDOT OFFICE OF TRANSPORTATION PLANNING.
- ** DISTANCES ARE SHOWN IN FEET (METERS). THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/ TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.)

THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TTCP SETUPS. THESE ADVANCE WARNING SIGNS ARE LOCATED PRIOR TO THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT. ADDITIONAL SIGNS (i.e. "RIGHT LANE CLOSED 1 MILE" AND "LEFT LANE CLOSED 1 MILE") HAVE BEEN SHOWN IN SOME FIGURES AS EXAMPLES OF REINFORCEMENT SIGN PLACEMENT BUT ARE USED IN RARE OCCASIONS.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

R2-10e, R2-10e, AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

Based on: Table 6C-1 MUTCD LATEST EDITION

SPEED*	DISTANCE
(km/h)	(m)
30	35
40	50
50	65
60	85
70	105
80	130
90	160
100	185
110	220
120	250

SPEED*	DISTANCE
(mph)	(ft)
20 25 30 45 50 55 60 65 70 75	115 155 200 250 305 360 425 495 570 645 730 820

*POSTED SPEED, OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

THESE VALUES MAY BE USED TO DETERMINE THE LENGTH OF LONGITUDINAL BUFFER SPACES.

THE DISTANCES IN THE ABOVE CHART REPRESENT THE MINIMAL VALUES FOR BUFFER SPACING.

Source: Table 6C-2 MUTCD LATEST EDITION



Notes for Traffic Management **FIGURE GEN-2**

NOTES ON WORK ZONE DISTANCES

CONVENTIONAL ROADWAY- A STREET OR HIGHWAY OTHER THAN A LOW-VOLUME ROAD, EXPRESSWAY, OR FREEWAY.

EXPRESSWAY- A DIVIDED HIGHWAY WITH PARTIAL CONTROL OF ACCESS.

FREEWAY- A DIVIDED HIGHWAY WITH FULL CONTROL OF ACCESS.

LOW-VOLUME ROAD- A FACILITY LYING OUTSIDE OF BUILT-UP AREAS OF CITIES, TOWNS, AND COMMUNITIES, AND IT SHALL HAVE A TRAFFIC VOLUME OF LESS THAN 400 AADT. IT SHALL NOT BE A FREEWAY, EXPRESSWAY, INTERCHANGE RAMP, FREEWAY SERVICE ROAD OR A ROAD ON A DESIGNATED STATE HIGHWAY SYSTEM.

Source: MUTCD LATEST EDITION

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

TYPE OF TAPER	TAPER LENGTH (L)*
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE-LANE, TWO-WAY TRAFFIC TAPER	50 FT MIN.(15 m) 100 FT(30 m) MAX.
DOWNSTREAM TAPER	50 FT MIN.(15 m) 100 FT MAX.(30 m) PER LANE

Source: Table 6C-3 MUTCD LATEST EDITION

FORMULAS FOR DETERMINING TAPER LENGTHS

SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	L= WS

SPEED LIMIT (S)	TAPER LENGTH (L) Meters
60 KM/H OR LESS	$L = \frac{WS^2}{155}$
70 KM/H OR MORE	$L = \frac{WS}{1.6}$

WHERE: L = TAPER LENGTH IN FEET (METERS)

W = WIDTH OF OFFSET IN FEET (METERS)

S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICAPATED OPERATING SPEED IN MPH (KM/H)

Source: Table 6C-4 MUTCD LATEST EDITION



Notes for Traffic Management FIGURE GEN-3

NOTES ON WORK ZONE DISTANCES







Appendix G

Lake Cochichewick Water Level Data

NORTH ANDOVER DRINKING WTP MONTHLY <u>AVG/MAX/MIN</u> LAKE LEVEL

(BARKSTE)	1 CARALLE	2022	STR. STR.		2021	Land State	たのなりない	2020		2019		
Month	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Mex	Min
Jan	0.00			0.00			112.54	112.72	112.35	112.73	112.97	112.48
Feb	0.00			0.00			112.89	113.13	112.65	112.94	113.1	112.78
Mar	0.00			0.00			112.96	113.23	112.68	113.02	113.3	112.73
Apr	0.00			0.00			113.36	113.68	113.03	113.42	113.74	113.1
May	0.00			0.00			113.18	113.3	113.05	113.44	113.58	113.3
Jun	0.00			0.00			112.56	113	112.12	113.70	113.9	113.5
Jul	0.00			0.00			111.92	112.2	111.63	113.58	113.75	113.4
Aug	0.00			0.00			55.80	111.6		113.05	113.4	112.7
Sep	0.00			0.00			0.00			112.34	112.7	111.98
Oct	0.00			0.00		1	0.00			111.90	112.1	111.7
Nov	0.00			0.00			0.00			112.07	112.2	111.93
Dec	0.00			0.00			0.00			112.49	112.79	112.18
Avg	0.00			0.00	12. and 12.		70.43	75.24	65.63	112.89	113.13	112.65

		2018	24.44		2017	724 TANK		2016		2015		
Month	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Mim
Jan	111.94	112.50	111.38	109.53	110.1	108.95	110.30	110.7	109.9	113.05	113.22	112.88
Feb	112.47	112.73	112.20	110.51	110.92	110.1	111.05	111.42	110.68	112.54	113.22	111.85
Mar	112.82	113.00	112.64	111.36	111.79	110.92	111.79	112.1	111.48	111.73	112.08	111.38
Apr	113.38	113.80	112.95	112.78	113.6	111.95	112.36	112.62	112.1	112.69	113.28	112.1
May	112.87	113.51	112.23	113.19	113.43	112.95	112.49	112.7	112.28	113.03	113.5	112.55
Jun	113.02	113.27	112.77	113.29	113.52	113.05	111.88	112.25	111.5	112.88	113.07	112.68
Jul	112.52	112.85	112.18	113.17	113.5	112.83	110.89	111.48	110.3	112.56	112.92	112.19
Aug	112.15	112.12	112.18	112.37	112.8	111.93	109.83	110.3	109.35	111.77	112.19	111.35
Sep	111.74	111.92	111.55	111.84	111.99	111.68	108.95	109.3	108.6	110.86	111.3	110.42
Oct	111.91	112.01	111.80	111.40	111.62	111.18	108.61	108.71	108.5	110.92	111.68	110.15
Nov	112.65	113.30	112.00	111.41	111.52	111.3	108.57	108.68	108.45	110.03	110.15	109.9
Dec	112.65	113.00	112.30	111.38	111.46	111.3	108.78	108.95	108.6	110.05	110.24	109.85
Avg	112.51			in the second	Star Star		110.46	110.77	110.15	111.84	112.24	111.44

The state	2014			2013			1	2012		2011		
Month	Avg	Max	Min									
Jan	111.94	112.30	111.58	111.77	111.90	111.64	112.43	112.75	112.10	109.09	109.38	108.80
Feb	112.58	112.90	112.25	112.21	112.52	111.90	112.54	112.78	112.30	109.73	110.05	109.40
Mar	113.14	113.40	112.87	112.77	112.92	112.61	112.70	112.90	112.50	111.39	112.52	110.25
Apr	113.28	113.60	112.95	113.13	113.30	112.95	112.89	113.10	112.68	112.96	113.25	112.67
May	113.00	113.10	112.90	113.08	113.25	112.90	113.21	113.40	113.02	113.20	113.29	113.10
Jun	112.57	112.93	112.20	113.24	113.62	112.85	113.39	113.50	113.28	113.09	113.38	112.80
Jul	112.00	112.30	111.70	113.47	113.75	113.18	112.84	113.38	112.30	112.58	113.00	112.15
Aug	111.33	111.70	110.95	112.85	113.30	112.40	111.99	112.37	111.60	111.93	112.10	111.75
Sep	109.93	110.95	108.90	112.17	112.40	111.93	111.32	111.65	110.98	111.79	111.90	111.68
Oct	110.48	110.28	110.68	111.64	111.90	111.38	110.88	111.05	110.71	112.25	112.70	111.80
Nov	110.79	110.60	110.97	111.24	111.39	111.09	110.95	111.10	110.80	112.44	112.70	112.18
Dec	112.03	110.95	113.10	111.39	111.58	111.19	111.16	111.60	110.72	112.42	112.74	112.10
Avg	111.92	112.08	111.75	112.41	112.65	112.17	112.19	112.47	111.92	111.90	112.25	111.56

	2010				2009	神经温度引		2008	A Share	2007		
Month	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
Jan	112.36	112.61	112.10	111.62	111.89	111.35	109.89	110.52	109.25	111.96	112.60	111.32
Feb	112.85	113.60	112.10	111.66	111.80	111.52	111.80	112.90	110.70	111.95	112.18	111.72
Mar	113.74	115.00	112.48	111.93	112.10	111.75	112.80	113.00	112.60	112.41	113.10	111.71
Apr	113.50	115.00	112.00	112.43	112.75	112.10	112.67	112.85	112.48	113.54	114.18	112.90
May	112.03	111.93	112.12	112.75	112.90	112.60	112.67	112.90	112.43	112.71	112.85	112.56
Jun	111.54	111.12	111.95	112.72	113.02	112.42	112.23	112.45	112.00	112.41	112.73	112.09
Jul	110.60	111.20	110.00	112.83	113.22	112.44	111.88	112.20	111.55	111.75	112.07	111.43
Aug	109.57	109.98	109.15	112.25	112.66	111.83	112.09	112.28	111.90	110.91	111.40	110.42
Sep	108.88	109.22	108.53	111.96	112.10	111.82	111.94	112.15	111.73	110.55	111.40	109.70
Oct	108.51	108.62	108.40	112.03	112.22	111.83	111.79	112.12	111.45	109.48	109.65	109.30
Nov	108.44	108.57	108.31	112.49	112.75	112.23	112.04	112.38	111.70	109.34	109.39	109.29
Dec	108.63	108.85	108.40	112.63	112.77	112.48	112.39	112.90	111.88	109.51	109.80	109.22
Avg	110.89	111.31	110.46	112.27	112.52	112.03	112.01	112.39	111.64	111.38	111.78	110.97

Part and		2006		No. William	2005			2004			2003	
Month	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min
Jan	113.16	113.50	112.82	112.90	113.10	112.70	112.62	113.22	112.02	109.69	109.95	109.42
Feb	112.71	113.00	112.42	112.48	112.62	112.33	112.00	112.10	111.90	110.07	110.29	109.84
Mar	112.10	112.40	111.80	112.56	112.99	112.12	112.10	112.30	111.90	111.30	112.30	110.30
Apr	111.90	112.00	111.79	113.19	113.50	112.88	113.28	113.97	112.58	113.03	113.65	112.40
May	113.44	115.00	111.88	113.49	114.00	112.97	113.56	113.76	113.35	113.33	113.68	112.98
Jun	113.55	114.10	112.99	113.52	113.85	113.18	113.04	113.57	112.51	113.49	113.68	113.30
Jul	113.19	113.36	113.02	112.81	113.16	112.45	112.12	112.49	111.75	112.96	113.50	112.41
Aug	112.69	113.08	112.30	111.80	112.40	111.20	111.55	111.80	111.30	112.65	112.90	112.40
Sep	112.06	112.30	111.82	110.76	111.20	110.31	111.54	111.69	111.39	112.06	112.31	111.80
Oct	111.83	112.00	111.65	111.04	112.08	109.99	111.53	111.64	111.41	111.65	111.80	111.50
Nov	112.65	113.30	112.00	112.31	112.59	112.03	111.51	111.63	111.38	111.85	111.90	111.79
Dec	112.92	113.29	112.55	113.11	113.50	112.71	112.20	112.73	111.67	112.53	113.20	111.86
Avg	112.68	113.11	112.25	112.49	112.92	112.07	112.25	112.58	111.93	112.05	112.43	111.67

S. Caller M.		2002		2001				2000	加全国的产品	1999		
Month	Avg	Max	Min									
Jan	108.20	108.30	108.10	112.52	112.60	112.43	109.46	109.61	109.30	110.15	110.90	109.40
Feb	108.44	108.57	108.30	112.80	113.00	112.60	110.05	110.60	109.50	111.35	111.80	110.90
Mar	108.50	109.00	108.00	114.15	115.30	113.00	111.20	111.80	110.60	112.45	112.90	112.00
Apr	109.49	109.49	109.48	113.50	114.70	112.30	112.56	113.31	111.80	112.83	112.95	112.70
May	109.98	110.45	109.50	112.00	112.30	111.70	112.85	113.20	112.50	112.55	112.70	112.40
Jun	110.54	110.69	110.39	111.60	111.90	111.30	112.94	113.18	112.70	111.83	112.45	111.20
Jul	110.23	110.68	109.78	111.35	111.75	110.95	112.57	112.80	112.33	110.75	111.20	110.30
Aug	109.16	109.73	108.59	110.40	110.90	109.90	112.30	112.60	112.00	109.75	110.30	109.20
Sep	108.33	108.60	108.05	109.48	109.90	109.05	111.75	112.00	111.50	109.25	109.60	108.90
Oct	107.88	108.04	107.72	108.59	109.00	108.18	111.35	111.50	111.20	109.25	109.40	109.10
Nov	108.00	108.29	107.70	108.21	108.52	107.90	111.49	111.78	111.20	109.15	109.30	109.00
Dec	108.81	109.40	108.22	108.30	108.39	108.20	112.05	112.40	111.70	109.23	109.35	109.10
Avg	108.96	109.27	108.65	111.07	111.52	110.63	111.71	112.07	111.36	110.71	111.07	110.35

The second	and the second second	1998		The state of	1997			1996	王、杨阳王以	1995		
Month	Avg	Max	Min	Avg	Max	Min	Avg	Max	Min.	Avg	Max	Min
Jan	110.25	111.0	109.5	112.80	113.10	112.50	110.50	111.50	109.50	111.55	112.20	110.90
Feb	111.98	113.0	111.0	112.25	112.50	112.00	112.10	112.60	111.60	112.60	113.00	112.20
Mar	112.70	112.9	112.5	112.40	112.90	111.90	113.10	113.60	112.60	112.80	113.10	112.50
Apr	112.75	113.0	112.5	113.15	113.40	112.90	113.45	114.00	112.90	112.28	112.10	112.45
May	112.90	113.5	112.3	112.60	112.80	112.40	112.50	112.90	112.10	112.10	112.20	112.00
Jun	113.10	113.8	112.4	112.30	112.70	111.90	111.35	112.00	110.70	111.60	112.10	111.10
Jul	112.00	112.5	111.5	111.30	111.80	110.80	110.65	110.90	110.40	110.60	111.10	110.10
Aug	111.03	111.5	110.6	110.30	110.70	109.90	110.35	110.80	109.90	109.40	110.00	108.80
Sep	110.18	110.6	109.8	109.55	109.90	109.20	110.00	110.30	109.70	108.50	108.80	108.20
Oct	109.88	110.2	109.6	108.90	109.20	108.60	111.80	113.50	110.10	108.20	108.30	108.10
Nov	109.80	109.9	109.7	108.85	109.10	108.60	112.10	112.90	111.30	108.75	109.30	108.20
Dec	109.55	109.7	109.4	109.28	109.45	109.10	112.45	113.30	111.60	109.40	109.50	109.30
Avg	111.34	111.8	110.9	111.14	111.46	110.82	111.70	112.36	111.03	110.65	110.98	110.32

The second		1994		the products	1993			1992			1991	all gallers
Month	Avg	Мак	Mim	Avg	Мах	Min	Avg	Max	Min	Avg	Max	Min
Jan	111.35	111.70	111.00									
Feb	112.20	112.20	112.20									
Mar	112.95	113.70	112.20									
Apr	113.05	113.70	112.40									
May	112.85	113.30	112.40									
Jun	112.35	113.00	111.70									
Jul	111.15	111.70	110.60									
Aug	110.10	110.50	109.70									
Sep	109.75	110.20	109.30									
Oct	109.85	110.20	109.50									
Nov	109.40	109.50	109.30									
Dec	110.18	110.85	109.50									
Avg	111.26	111.71	110.82	Hardenstein			Ballin and					王の